

# 2011-2012 Undergraduate Calendar

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

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

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

The University is a full member of:

- The Association of Universities and Colleges of Canada

Contact Information:

University of Guelph  
Guelph, Ontario, Canada  
N1G 2W1  
519-824-4120  
<http://www.uoguelph.ca>

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# Disclaimer

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## University of Guelph 2011

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

The University reserves the right to change without notice any information contained in this calendar, including fees, 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 publication of information in this calendar does not bind the University to the provision of courses, programs, schedules of studies, or facilities as listed herein.

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 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.

In the event of a discrepancy between a print version (downloaded) and the Web version, the Web version will apply.

Published by: Undergraduate Program Services

# Introduction

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## Collection, Use and Disclosure of Personal Information

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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/index.html>. 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

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

## Address for University Communication

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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

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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. See Section I--Statement of Students' Academic Responsibilities for more information.

### Home Address

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Students are responsible for maintaining a current mailing address with the University. Address changes can be made, in writing, through Undergraduate Program Services.

## Name Changes

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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

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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/pdf/ORSInfoReleasePolicy060610.pdf>.



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## XII. Course Descriptions

### General Information

#### Course Labelling and Levels

Each course is identified by a two-part code. The first part of the code refers to the subject area, the second to the level of the course. Thus, the course PSYC\*3570 is a course in the subject area of Psychology (PSYC\*XXXX), and is of a level that places it among courses in the 3000 series. The series 1000, 2000, 3000 and 4000 numbers are intended to indicate progressively more demanding content, and correspondingly increasing competence on the part of the students enrolled in the course. Courses in the 1000 series are mainly for first year students, those in the 2000 series are mainly for second year students, and those in the 3000 series are for third year students. Similarly, courses in the 4000 series are mainly intended to be taken by students in the fourth year of honours programs. It is important that students planning their courses have clearly in mind the significance of these numbers so that they may guard against undertaking course work at levels for which they are insufficiently prepared. A two-semester course (e.g. AGR\*2351/2) is taken over 2 continuous semesters and counts as 1 course attempt per semester for classification, continuation of study and calculation of fees. Two-semester courses cannot be split.

#### Course Information

The letters S, F, W indicate the University's intention to offer the course in the Summer (S), Fall (F) or Winter (W) semester during the academic year covered by this Calendar. Although courses normally will be offered in the semester indicated, students preparing their course programs are advised to consult the Undergraduate Course Timetable. The University cannot guarantee that all courses will be offered in the exact semester indicated.

The letter U indicates that an intended offering has not been assigned to the course. Students should consult the Undergraduate Course Timetable posted on WebAdvisor <<https://webadvisor.uoguelph.ca/>> or contact the departments offering those courses to determine the semester offerings.

The figures in parentheses ( ) following the semester designation are a general guide to the lecture and laboratory contact hours per week, the first digit being the number of lecture hours and the second, the number of laboratory hours. The credit weight for each course appears in brackets [ ]. A credit weight of [0.50] indicates 10-12 student effort hours, including class time, on academic tasks associated with the course.

Detailed course descriptions are maintained at the office of the department offering the course. Some courses, designated "Experiential Learning" courses in the Calendar description, are deliberately designed to accommodate the need to grant academic credit for experiential learning external to regular courses, in such contexts as co-operative education, field observation/job shadowing, internship/externships, practical, service learning, or work study (and other approved experience). Prior approval for admission to these courses must be obtained from the department and instructor concerned.

#### Course Prerequisites

In lists of course prerequisites, "or" conditions are spelled out explicitly, but "and" conditions are indicated with a comma ",". For example: "CSTU\*2270, FRHD\*2010, NUTR\*2010" means "CSTU\*2270 and FRHD\*2010 and NUTR\*2010". A number of courses have stated prerequisites which are prior requirements for entry to the course. Students who do not satisfy course prerequisites, or who in the opinion of the instructor do not possess an equivalent background to that of the stated prerequisites, are not eligible to enroll in the course. When some specific background is desirable but not required, the course description will include a statement of recommended background. It is understood that the instructor may accept equivalent courses from other institutions in place of the stated prerequisites. Students who wish to enroll in courses for which they do not have the stated prerequisite(s) must obtain instructor approval as outlined in Section VIII, Undergraduate Degree Regulations and Procedures, in this Calendar.

#### Course Equates and Restrictions

**Equates** - Equate indicates a course identical to the one under which it is listed. The course may have been re-numbered or may be cross-listed under two subject areas.

**Students will not be permitted to register in equated courses.**

**Restrictions** - A restriction is a "rule" that is placed on the computer system (Colleague) at the direction of an academic department so that particular students may not register in particular courses. The course may be restricted because there is sufficient over-lap in content with another course so that it is inappropriate for the student to take a similar course for credit. In a different instance, the course may be restricted by "Instructor Consent" so that the student must discuss the special requirements of the course with the instructor before enrolling. Or, alternatively, the restriction may reflect a "Priority Access" designation for enrolment management purposes. (See Priority Access).

## Accounting

*Department of Business - College of Management and Economics*

### **ACCT\*2220 Financial Accounting F,W (3-0) [0.50]**

An introductory course designed to develop an understanding of current accounting principles and their implication for published financial reports of business enterprises. The course approaches the subject from the view of the user of accounting information rather than that of a person who supplies the information.

*Prerequisite(s):* 1 of ECON\*1050, ECON\*1100, ENGG\*3240

*Equate(s):* AGECE\*2220 , BUS\*2220

*Restriction(s):* Priority Access course. Enrolment may be restricted to particular programs or specializations. See department for more information.

### **ACCT\*2230 Management Accounting F,W (3-0) [0.50]**

This course emphasizes the use of accounting information to facilitate effective management decisions. Topics include cost determination, cost control and analysis, budgeting, profit-volume analysis and capital investment analysis.

*Prerequisite(s):* 1 of ACCT\*2220, AGECE\*2220 , BUS\*2220

*Equate(s):* AGECE\*2230 , BUS\*2230

*Restriction(s):* Priority Access course. Enrolment may be restricted to particular programs or specializations. See department for more information.

### **ACCT\*2240 Applied Financial Accounting F (3-0) [0.50]**

In this course students will learn to apply the fundamental principles emanating from accounting's conceptual framework and undertake the practice of financial accounting. Students will become adept at performing the functions related to each step in the accounting cycle up to and including the preparation of the financial statements and client reports through a semester-long business simulation. Additionally, students will develop the skills necessary for assessing an organization's system of internal control and financial condition.

*Prerequisite(s):* ACCT\*2220 or BUS\*2220

*Equate(s):* BUS\*2240

### **ACCT\*3230 Intermediate Management Accounting W (3-0) [0.50]**

This course continues the managerial decision making focus of ACCT\*2230. Topics include process costing, transfer pricing, the decision making process, variances and performance measurement.

*Prerequisite(s):* 1 of ACCT\*2230, AGECE\*2230 , BUS\*2230

*Equate(s):* BUS\*2230

*Restriction(s):* Enrolment may be restricted to particular degrees or programs. See department for more information.

### **ACCT\*3280 Auditing I F (3-0) [0.50]**

Auditing I is an examination of the principles and theory underlying the practice of auditing. Concepts of materiality and audit risk are examined and discussed. Sources and techniques for gathering auditing evidence will also be examined. Modern organizations rely on information systems, technology and internal controls to manage and monitor their operations and the impact of these systems on the quality of information produced and on the scope of audits are important elements of this course.

*Prerequisite(s):* ACCT\*3330 or BUS\*3330

*Equate(s):* BUS\*3280

*Restriction(s):* BUS\*4280

### **ACCT\*3330 Intermediate Financial Accounting I W (3-0) [0.50]**

This course presents a critical evaluation of accounting concepts, principles and practices in relation to both the traditional and current value accounting measurement models. Emphasis will be on the effect of alternative accounting practices and measurement models on income determination and asset valuation.

*Prerequisite(s):* 10.00 credits including (1 of ACCT\*2220, AGECE\*2220 , BUS\*2220 )

*Equate(s):* AGECE\*3330 , BUS\*3330

### **ACCT\*3340 Intermediate Financial Accounting II F (3-0) [0.50]**

This course will build on the foundation in financial accounting concepts and principles gained in ACCT\*3330. The focus is on how entities account for current and non-current liabilities and equity accounts, including, income taxes, leases, pensions and other post retirement benefits, share equity and retained earnings, stock options. Additional topics may include earnings per share, restatements and statement analysis.

*Prerequisite(s):* ACCT\*3330 or BUS\*3330

*Equate(s):* BUS\*3340

### **ACCT\*3350 Taxation F (3-0) [0.50]**

The fundamentals of the tax system as it applies to all taxpayers will be the focus of the first half of the course. The second half will develop forms of business organizations from a tax perspective. Basic tax planning techniques which attempt to maximize the cash flows and returns on investments will then be studied. The emphasis in the course is on business decision making. A review of personal financial planning and investment decisions will also be included.

*Prerequisite(s):* BUS\*3320, (ACCT\*3330 or BUS\*3330 )

*Equate(s):* BUS\*3350

*Restriction(s):* Enrolment may be restricted to particular degrees or programs. See the department for more information.

### **ACCT\*4220 Advanced Financial Accounting F (3-0) [0.50]**

This course is a critical evaluation of issues and problems associated with business combinations, long-term intercorporate investments, foreign operations and accounting for not-for-profit organizations. There is a strong emphasis on applying this body of knowledge through practical problems.

*Prerequisite(s):* (ACCT\*3330 or BUS\*3330 ) , (ACCT\*3340 or BUS\*3340 )

*Equate(s):* BUS\*4220

*Restriction(s):* Enrolment may be restricted to particular degrees or programs. See the department for more information.

### **ACCT\*4230 Advanced Management Accounting W (3-0) [0.50]**

This course provides advanced coverage of management accounting concepts and the application of management accounting information for managerial decision-making. This course extends the concepts covered in intermediate management accounting and also integrates pertinent situational problems from other functional areas of enterprises such as global trade and process controls.

*Prerequisite(s):* ACCT\*3230 or BUS\*3230

*Equate(s):* BUS\*4230

*Restriction(s):* Enrolment may be restricted to particular degrees or programs. See the department for more information.

### **ACCT\*4240 Accounting Theory and Integrated Cases W (3-0) [1.00]**

This course exposes the student to a broad variety of issues in accounting theory and financial reporting.

*Prerequisite(s):* ACCT\*3340 or BUS\*3340

*Equate(s):* BUS\*4240

### **ACCT\*4270 Auditing II F (3-0) [0.50]**

This course considers a number of advanced topics concerning both the auditor and audit techniques within the context of public accounting. It builds on the knowledge of the audit task derived in Auditing I - BUS\*3280 as well as the depth and breadth of knowledge gained in ACCT\*3330 and ACCT\*3340. (First offering Fall 2012.)

*Prerequisite(s):* ACCT\*3280 or BUS\*3280

*Equate(s):* BUS\*4270

### **ACCT\*4290 Auditing III W (3-0) [0.50]**

This course introduces the student to the field of auditing within the field of Electronic Data Processing(EDP). (First offering Winter 2013.)

*Prerequisite(s):* ACCT\*4270 or BUS\*4270

*Equate(s):* BUS\*4290

### **ACCT\*4350 Income Taxation II W (3-0) [0.50]**

An intensive study of the Canadian Income Tax Act and related statutes, this course will focus on the application to the taxation of individuals, partnerships and corporations. A strong emphasis will be placed on compliance and tax planning. (First offering Winter 2013.)

*Prerequisite(s):* ACCT\*3350 or BUS\*3350

*Equate(s):* BUS\*4350



## Agriculture

*Ontario Agricultural College, Dean's Office*

### AGR\*1050 Communication Skills W (3-2) [0.50]

Students will develop written language skills, oral communication, and presentation skills. The development of practical skills includes writing business letters and other business correspondence, formal and informal reports, instructional writing, critical thinking and critical writing. Students will present and deliver a variety of information and persuasive oral presentations.

*Restriction(s):* Registered in B.B.R.M.

*Location(s):* Ridgetown, Kemptville

### AGR\*1100 Introduction to the Agrifood Systems F (2-3) [0.50]

This course examines current events within various production and maintenance sectors in an effort to gain up-to-date knowledge and analytical skills when dealing with issues in agri-food, landscape and associated industries.

*Restriction(s):* AGR\*1150 , UNIV\*1500 , enrolment in the B.Sc.(Agr.),

B.Comm.(AGBU.), or B.A.(AGEC) program

### AGR\*1250 Agrifood System Trends & Issues W (3-2) [0.50]

The course examines the complexities and contributing factors within the food system, production agriculture and landscapes management. From producer to consumer, students will examine ways in which each stage of a system process is empowered by various inputs as well as directed by various influences.

### AGR\*2030 Pasture Management F (3-2) [0.50]

This course focuses on forage and weed identification, establishing, maintaining and improving pasture for grazing or cropping, and environmental and conservation stewardship approaches to pasturelands.

*Prerequisite(s):* BIOL\*1040, SOIL\*2010

*Restriction(s):* Registered in B.B.R.M. Equine Management.

*Location(s):* Kemptville

### AGR\*2100 Human Resource Management W (3-2) [0.50]

This course will introduce students to theoretical and practical skills of management and interacting with people. Topics will include recruiting, supervising, motivation, training employees, effective listening, dealing with difficult people, group dynamics and leadership skills.

*Restriction(s):* Registered in B.B.R.M.

*Location(s):* Ridgetown, Kemptville

### AGR\*2150 Plant Agriculture for International Development F (3-0) [0.50]

This course will provide students interested in international development with an introductory mechanistic understanding of the biology underlying crop production in developing nations. Emphasis will be placed on simple, low-cost solutions from biology that have the potential to aid efforts in international development. This course is accessible to science and non-science students. Offered by the Department of Plant Agriculture.

*Prerequisite(s):* 4.00 credits

*Restriction(s):* AGR\*2470

### AGR\*2320 Soils in Agroecosystems F (3-3) [0.50]

This course is an introduction to soil resources with emphasis on management practices that will sustain the productivity of these resources and enhance the quality of the ecosystems of which they are a part. Students will develop a management plan for a farm that will take into account the roles of geological, geomorphological, biological, climatic and temporal factors on the formation, properties and uses of soils. The management plans will be placed in the broader context of provincial policies related to soil, air and water resources and local zoning regulations.

*Prerequisite(s):* [BIOL\*1040 or (2 of BIOL\*1070, BIOL\*1080, BIOL\*1090)],

CHEM\*1040, MATH\*1080

*Restriction(s):* AGR\*2301/2 , SOIL\*2010

### AGR\*2350 Animal Production Systems, Health and Industry F (3-3) [0.50]

This course is designed to introduce the student to the Agri-food system in Ontario, national and international. All major animal industries will be covered starting from the grocery store and working back to the primary producer. Companion and exotic animals will also be covered. Topics include food, health and wellness (domestic animals and human), nutrition, housing, genetics, reproduction, husbandry practices and processing. Laboratories include product taste testing and evaluation, and animal production unit tours (including visits to major animal housing units generally on the second Saturday of the semester).

*Prerequisite(s):* BIOL\*1030 or (2 of BIOL\*1070, BIOL\*1080, BIOL\*1090)

### AGR\*2400 Economics of the Canadian Food System F (3-1) [0.50]

This course introduces students to the major aspects of economics, business and resource use in the Canadian agrifood sector. Students will be exposed to the techniques used by agrifood firms to plan, invest and measure performance. Decision making under both certainty and uncertainty will be considered. Students will be shown how the market equilibrium model can be used to conduct welfare analysis and modified to account for imperfect competition and externalities.

*Prerequisite(s):* AGR\*1250, ECON\*1050

*Restriction(s):* AGR\*2401/2

### AGR\*2470 Introduction to Plant Agriculture F (3-3) [0.50]

The basic principles of plant morphology, nutrition, growth and development will be related to where and how agriculturally significant plants are grown. Agroecosystems and farming systems will be considered as frameworks for crop production analyses. The course uses examples from temperate, sub-tropical and tropical crops and cropping systems. Labs include problem-solving exercises in the context of plant production.

*Prerequisite(s):* BIOL\*1030 or (BIOL\*1070, BIOL\*1090)

*Restriction(s):* AGR\*2451/2

### AGR\*2500 Field Course in International Agriculture W (3-0) [0.50]

This course introduces students to a wide range of tropical and subtropical agricultural production systems and issues. The course is comprised of a weekly 3 hour evening lecture and a two week field trip to Costa Rica where students will visit corporate and individual farms, university and government research stations. The field trip occurs during Reading Week in February. This course must be recorded as part of your Winter course selection. The cost of the course is approximately \$2500.00 per student, in addition to tuition and compulsory fees. Students must identify their interest in taking this course by contacting the OAC Dean's Office before the October course selection period of the previous year. In order to confirm reservations for travel arrangements a deposit of \$300 in the form of a cheque, made payable to the University of Guelph, must be submitted to the OAC Dean's Office by November. Some scholarship support is available to B.Sc.(AGR.) students. Applications for scholarship support are due in Student Financial Services, Office of Registrarial Services by December 1st.

*Prerequisite(s):* AGR\*1250 or registration in International Development

*Restriction(s):* Registration in B.Sc.(Agr.) or B.A.(ID) or Minor in Agriculture.

Instructor consent required.

### AGR\*3010 Special Studies in Agricultural Science I S,F,W (3-0) [0.50]

A special study option that enables undergraduate students in semesters 5 through 8 to undertake specific projects in agricultural sciences. The topic of the special study will be determined in consultation with an faculty member and the individual student. Students are responsible for making appropriate arrangements with faculty at the departmental and/or college level prior to registration for the course.

*Prerequisite(s):* 10.00 credits

*Restriction(s):* Instructor consent required.

### AGR\*3500 Experiential Education I F (3-0) [0.50]

Student initiated experiential learning opportunities can be developed as a credit course in consultation with a supervising faculty member. Details of the activities included in the program will be outlined in a learning contract initiated by the student and agreed by the faculty supervisor in the April prior to the commencement of the work experience. The employer will also provide a description of the project and/or the work experience. The course is designed to meet the needs of B.SC.(Agr.), B.B.R.M. and Agricultural Business students.

*Prerequisite(s):* 5.00 credits

*Restriction(s):* Instructor consent required.

### AGR\*3510 Experiential Education II F (3-0) [0.50]

The purpose of this course is to enable students to gain generic career skills by actively reflecting on their own skills in the context of their own summer employment. Students conduct a self-assessment, and work to improve skills they themselves select as goals. They also undertake a major project that is probably, but not necessarily, related to their summer employment. This project is done with the assistance of a faculty advisor. Fall classes of poster presentations to share experiences.

*Prerequisite(s):* AGR\*3500

*Restriction(s):* Instructor consent required.

### AGR\*4010 Special Studies in Agricultural Science II S,F,W (3-0) [0.50]

A special study option that enables undergraduate students in semesters 5 through 8 to undertake specific projects in agricultural science. The topic of the special study will be determined in consultation with an OAC faculty member and the individual student. Students are responsible for making appropriate arrangements with faculty member prior to registration for the course.

*Prerequisite(s):* 15.00 credits

*Restriction(s):* Instructor consent required.

**AGR\*4450 Research Project I S,F,W (0-12) [1.00]**

Independent study of a current topic in agricultural or environmental science designed to encourage senior undergraduates to conduct research. The course includes participation in meetings organized by the coordinator, work with a faculty advisor to develop a research project, formulate hypotheses, design and carry out preliminary experiments to test the hypotheses. Students will carry out independent library research, begin experimental work, prepare a written report and make a presentation to other students in the course of the research plan and preliminary results. Students must make arrangements with both the faculty supervisor and the course coordinator at least one semester before starting the course. Open to students in semesters 5, 6, 7, and 8 of the B.Sc. (Agr.) or B.Sc. degree program. This course will normally be followed by AGR\*4460 to provide 2 semesters to complete the research project.

*Prerequisite(s):* Completion of semester 4 in any relevant major of the B.Sc. (Agr.) or B.Sc. program, 70% cumulative average.

*Restriction(s):* Permission of the course coordinator (contingent on the availability and agreement of a faculty advisor)

**AGR\*4460 Research Project II S,F,W (0-12) [1.00]**

Independent study of a current topic in agricultural or environmental science designed to encourage senior undergraduates to conduct research. The focus of this course will be the completion of the research plan developed in AGR\*4450 by the student in consultation with a faculty advisor. The course includes participation in meetings organized by the coordinator and meetings with a faculty advisor to review research progress. Students will carry out independent research, prepare a written report of the research findings in a scholarly style and make a presentation to other students in the course of the research results. Open to students in semesters 6, 7 and 8 of the B.Sc. (Agr.) or B.Sc. degree program.

*Prerequisite(s):* AGR\*4450

*Restriction(s):* Permission of the course coordinator and faculty advisor

**AGR\*4500 Agrifood Industry Problem-Solving W (3-0) [0.50]**

This course will provide senior level students in agricultural and related sciences with experience in working as a team to propose solutions to agrifood industry problems. The perspective of the best solution will be the agrifood system rather than any individual stakeholder group. Attention will be given to integrating material from different disciplines, further refining skills in problem-solving, and communication. Students and faculty will meet prior to the conclusion of the preceding semester to identify industry projects, student expertise, and to develop a preliminary strategy.

*Prerequisite(s):* 3.50 credits at the 3000 level or 1.50 credits at the 4000 level in any agricultural science area or agricultural business area.

## **Anatomy**

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*Department of Biomedical Sciences*

*For course listings and descriptions see Biomedical Sciences.*

*Additional course listings may be found in the course descriptions for Human Kinetics, Veterinary Medicine and Zoology.*

## Animal Science

### Department of Animal and Poultry Science

#### ANSC\*2330 Horse Management Science F (3-0) [0.50]

An introduction to horse management designed to give those with an interest in the various segments of the horse industry a strong scientific basis for production and management decisions. The course includes study of the evolution of our current industry, the biology of growth, performance and management of the equine athlete. The evaluation of conformation as it relates to performance as well as aspects of behaviour, nutrition, reproduction and genetics consistent with the level of the course are included.

*Prerequisite(s):* [BIOL\*1040 or (2 of BIOL\*1070, BIOL\*1080, BIOL\*1090)]

*Restriction(s):* Registration in B.B.R.M.(EQM).

#### ANSC\*2340 Structure of Farm Animals W (3-1) [0.50]

This course is an introduction to the carcass structure of cattle, pigs, sheep and poultry. Animal growth and development are considered in relation to meat production. The course is for students intending to major in Animal Science and Animal Biology. (Also offered through Distance Education Format.)

*Prerequisite(s):* BIOL\*1040 or (2 of BIOL\*1070, BIOL\*1080, BIOL\*1090)

#### ANSC\*3050 Aquaculture: Advanced Issues F (3-0) [0.50]

This course examines the fundamental principles and advanced interdisciplinary issues involved in the farming of aquatic organisms. The course will concentrate primarily on finfish species due to their worldwide commercial importance. Lectures will cover fish physiology, behaviour, nutrition, genetics, water quality, health and disease, reproductive techniques, economic, political and legal issues and various culture technologies. Students will analyze contemporary challenges facing the aquaculture industry through exercises requiring interdisciplinary knowledge, lateral thinking, creative problem solving and bridging science and technology to issues management. (Offered in odd-numbered years.)

*Prerequisite(s):* A minimum of 8.00 credits in biology, including AGR\*2350 or ZOO\*2090

*Restriction(s):* ANSC\*2200

#### ANSC\*3080 Agricultural Animal Physiology F (3-1.5) [0.50]

This course is an introduction to the physiology of domesticated farm animals. The course will emphasize homeostatic control of the major body systems. The lectures cover the nervous, cardiovascular, respiratory, urinary, immune, endocrine and reproductive systems. The lectures and laboratories are closely integrated.

*Prerequisite(s):* BIOC\*2580

*Restriction(s):* Registration in B.Sc.(Agr.) or B.Sc. Animal Biology

#### ANSC\*3120 Introduction to Animal Nutrition F (3-2) [0.50]

This course applies the principles of nutrition to the development of diets and feeding programs for the various species of animals of agricultural importance. Department of Animal and Poultry Science.

*Co-requisite(s):* NUTR\*3210

*Restriction(s):* Registration in B.Sc.(Agr.) or B.Sc. Animal Biology

#### ANSC\*3170 Nutrition of Fish and Crustacea W (3-0) [0.50]

The nutrition of fish and crustaceans with emphasis on those species used in aquaculture. Nutritional biochemistry, nutritional pathology and comparative nutrition of cold blooded, ammonotelic animals mainly carnivorous, contrasted with warm blooded ureotelic omnivores. (Offered in even-numbered years.)

*Prerequisite(s):* NUTR\*3190 or NUTR\*3210

*Equate(s):* NUTR\*3340

#### ANSC\*3180 Wildlife Nutrition W (3-0) [0.50]

A study of the nutrition of avian and mammalian wildlife with emphasis on North American species. The role of nutrition in survival and population growth of wildlife in their natural habitat. Formulation of diets for wild species in captivity.

*Prerequisite(s):* NUTR\*3190 or NUTR\*3210

*Equate(s):* NUTR\*3350

#### ANSC\*3210 Principles of Animal Care and Welfare W (3-1.5) [0.50]

Students will be introduced to the major ethical theories that deal with humanity's duties to animals. The relationship of ethics to science will be discussed. Factors that contribute to the quality of life of animals will be considered and methods of assessing animal welfare will be described. Common causes of reduced animal welfare will be covered. The course will also deal with how different cultures approach animal welfare and attempt to regulate it. (Also offered through Distance Education format.)

*Prerequisite(s):* A minimum of 7.50 credits including AGR\*2350

*Restriction(s):* ANSC\*3150

#### ANSC\*4020 Genetics of Companion Animals F (3-0) [0.50]

This course includes theoretical and applied aspects of practical breeding programs for performance, pleasure and hobby animal populations leading to genetic improvement and population stability. Quantitative genetics and biotechnology are integrated using case studies to develop practical and sustainable breeding programs for horses, dogs, cats, rabbits and hobby livestock. Legislative requirements governing animal registration and breed development are also explored.

*Prerequisite(s):* MBG\*3060

#### ANSC\*4050 Biotechnology in Animal Science F (3-2) [0.50]

Starting from the principles of recombinant DNA, DNA marker identification, stem cell and generation of transgenic animals, the course provides an overview on how biotechnology has impacted biomedical science and animal production. The current challenges and potential opportunities in this field are discussed.

*Prerequisite(s):* MBG\*2000 or MCB\*2050

#### ANSC\*4090 Applied Animal Behaviour F (3-0) [0.50]

This course deals with why domesticated animals behave as they do with reference to causation, function, ontogeny and phylogeny. Basic principles are illustrated by examples taken from all the common domesticated and captive species. Emphasis is placed on the application of behavioural knowledge to improve captive environments and animal production systems. Designing housing, facilities and management procedures to suit the behaviour of the animals in question is also covered.

*Prerequisite(s):* ANSC\*3080

*Restriction(s):* ANSC\*4070

#### ANSC\*4100 Applied Environmental Physiology and Animal Housing W (3-0) [0.50]

Basic concepts of environmental physiology and their application to animal housing and management will be introduced. The course will review the physics of heat flow, light and air quality as they relate to animal biology and health. Other aspects, such as the physical environment, that impact on animal health and well-being will be discussed.

*Prerequisite(s):* ANSC\*3080

*Restriction(s):* ANSC\*4080

#### ANSC\*4230 Challenges and Opportunities in Animal Production F (0-6) [0.50]

This course will provide senior level students with experience in working as a team to propose solutions to animal industry problems. Teams of students will critically assess animal-related businesses at the farm or industry level under the supervision of a faculty member. Students and faculty will meet in the preceding Winter semester to identify common interests and develop a preliminary strategy.

*Prerequisite(s):* ANSC\*3080, NUTR\*3210, MBG\*3090

*Restriction(s):* Instructor consent required.

#### ANSC\*4260 Beef Cattle Nutrition W (3-0) [0.50]

This course is designed for students to evaluate problems in feeding beef cattle. Relevant aspects of digestion and metabolism of nutrients as well as current issues of feeding beef cattle and diagnosing nutritional deficiencies will be included.

*Prerequisite(s):* ANSC\*3120

*Restriction(s):* ANSC\*4160

#### ANSC\*4270 Dairy Cattle Nutrition F (3-0) [0.50]

This course is designed to apply principles of dairy cattle nutrition to solving on-farm nutritionally based problems. A case study approach will be used in conjunction with computer modeling and computer ration formulation programs.

*Prerequisite(s):* ANSC\*3120

*Restriction(s):* ANSC\*4170

#### ANSC\*4280 Poultry Nutrition F (3-0) [0.50]

This course is designed to evaluate nutrient requirements of poultry. Students will learn how to apply feeding programs for meat, laying birds and breeders and how feeding affects poultry meat and egg composition.

*Prerequisite(s):* ANSC\*3120

*Restriction(s):* ANSC\*4180

#### ANSC\*4290 Swine Nutrition F (3-0) [0.50]

This course is designed to explore details of evaluating feed ingredients and formulating diets for swine. Students will use models to evaluate various aspects of nutrient partitioning for growth and reproduction in pigs.

*Prerequisite(s):* ANSC\*3120

*Restriction(s):* ANSC\*4190

**ANSC\*4350 Experiments in Animal Biology W (0-6) [0.50]**

This course provides an opportunity for hands-on projects involving live animals and laboratory techniques. Projects will be provided by APS faculty within their broad fields of study, for example animal behaviour and welfare, environmental physiology, endocrinology, and reproduction. Approval of the ABIO Faculty Advisor must be obtained before course selection.

*Prerequisite(s):* ANSC\*3080, ANSC\*3300 , ANSC\*4090

*Co-requisite(s):* ANSC\*4100, ANSC\*4490

*Restriction(s):* Registration in Animal Biology Major. Instructor consent required.

**ANSC\*4470 Animal Metabolism W (3-0) [0.50]**

Current concepts in whole animal metabolism and the quantitative techniques used to measure whole body metabolic kinetics will be presented. Tissue and organ specific biochemical processes will be integrated with whole body control mechanisms.

*Prerequisite(s):* NUTR\*3190 or NUTR\*3210

**ANSC\*4490 Applied Endocrinology W (3-0) [0.50]**

This course examines the endocrine systems of farm animals and their applications to livestock production. Considerable emphasis will be placed upon understanding how knowledge of endocrine regulation can be applied within animal production systems.

*Prerequisite(s):* ANSC\*3080

*Restriction(s):* ANSC\*4480

**ANSC\*4550 Horse Nutrition W (3-0) [0.50]**

This course is designed to provide students with the most current knowledge of nutrition of horses and other domestic non-ruminant herbivores. Influence of nutrition on musculo-skeletal development and function will be emphasized. (Last offering - winter 2011)

*Prerequisite(s):* NUTR\*3190 or NUTR\*3210

*Restriction(s):* ANSC\*4500

**ANSC\*4560 Pet Nutrition F (3-0) [0.50]**

This course covers nutrient requirements, feed formulation and nutritional idiosyncrasies for dogs, cats, and exotic pets.

*Prerequisite(s):* NUTR\*3190 or NUTR\*3210

*Restriction(s):* ANSC\*4510

**ANSC\*4610 Critical Analysis in Animal Science W (3-0) [0.50]**

Each student will select and critically review a topic of emerging importance in animal science. The topic will be presented to the group as a written paper in journal format, as a poster, and as a formal seminar. This course is designed for students in their final year of the Animal Biology Major.

*Prerequisite(s):* 12.00 credits including 2.00 in animal sciences

**ANSC\*4650 Comparative Immunology W (3-0) [0.50]**

Livestock and fish have developed common and unique defense strategies for resisting microbial and viral infections. The focus of this course is to review and compare these defense mechanisms in different tissues, and describe the significance of neuroendocrine signalling, genetic polymorphisms, nutrition and food-borne toxins, and host-microbial interaction in regulating innate and acquired immune responses and disease resistance.

*Prerequisite(s):* ANSC\*3080

**ANSC\*4700 Research in Animal Biology I S,F,W (0-6) [0.50]**

This course is an opportunity for those students potentially interested in postgraduate studies to work with a committed faculty advisor to research a problem, analyse data and/or design experiment(s) that address a solution. Evaluation of the course requires a substantive literature review and/or data analysis. Selection of a faculty supervisor and approval from course coordinator must be obtained before course selection.

*Prerequisite(s):* 14.00 credits

*Restriction(s):* Registered in Animal Biology Major. Instructor consent required.

**ANSC\*4710 Research in Animal Biology II S,F,W (0-6) [0.50]**

This course is a continuation of ANSC\*4700, Research in Animal Biology I. It allows more sophisticated projects to be undertaken or to provide an opportunity to build upon the work of ANSC\*4700 . Evaluation of the course requires a greater emphasis on data analysis or experimental design than for ANSC\*4700. Selection of a faculty advisor and approval of course coordinator must be obtained before course selection.

*Prerequisite(s):* 14.00 credits

*Restriction(s):* Registration in Animal Biology Major. Instructor consent required.

## Anthropology

### Department of Sociology and Anthropology

The Department of Sociology and Anthropology offers three types of courses: sociology courses with the prefix SOC\*; anthropology courses with the prefix ANTH\*; and departmental courses with the prefix SOAN\*.

Courses will normally be offered in the semesters designated. For information on other semesters these courses will be offered and the semesters those courses without designations will be offered, please check with the department. In addition to regularly scheduled courses, students may elect to do independent study. A student who wishes to do a reading course should first consult the professor with whom he/she wishes to work. Please note: a student is allowed a total of 1.00 credits only for reading courses.

Please note: The availability of third and fourth year seminar courses will vary. Students must check with the Department of Sociology and Anthropology to see when seminar courses are available.

#### ANTH\*1120 Biological Anthropology F (3-0) [0.50]

In this course students will be introduced to the central concepts of biological anthropology. Potential topics to be explored include hominid evolution, contemporary human diversity, nutrition and diet, and an introduction of forensic anthropology and paleopathology.

#### ANTH\*1150 Introduction to Anthropology S,F,W (3-0) [0.50]

An introductory course dealing with humankind from a broad historical and cross-cultural perspective. Theoretical models, case studies and specific methods will be presented. Course topics may include the origin and transformations of human society, the relationship between biological and cultural traits, human language, variation in family structure and religion, the economic and political aspects of human society. (Also offered through Distance Education format.)

#### ANTH\*2160 Social Anthropology W (3-0) [0.50]

This course will cover basic concepts that contribute to various anthropological approaches to the study of culture and society, such as the case study method and participant observation. The development of theory and methods will be examined through reading selected classic and contemporary ethnographies.

*Prerequisite(s):* ANTH\*1150

#### ANTH\*2230 Regional Ethnography F (3-0) [0.50]

This course offers a survey of ethnographic studies on selected cultural/geographical areas of the world. Topics covered may include social, economic and political systems, the colonial encounter, and the theoretical, methodological and political contexts of ethnographic representation. Focus may be given to such areas as Latin America, Sub-Saharan Africa, Asia, or Oceania.

*Prerequisite(s):* ANTH\*1150

*Restriction(s):* ANTH\*4230

#### ANTH\*2660 Contemporary Native Peoples of Canada W (3-0) [0.50]

An analysis of the impact of Euro-Canadian society on native culture. Particular emphasis will be given to contemporary issues relating to Canadian native peoples (Indians, Inuit and Metis) such as education, treaties and reserves, land claims, government administration and economic development.

*Prerequisite(s):* ANTH\*1150 or SOC\*1100

#### ANTH\*3400 The Anthropology of Gender W (3-0) [0.50]

This course will address theoretical innovation in the discipline of socio-cultural anthropology in the study of gender and feminist issues on the basis of cross-cultural ethnographic case studies. Theoretical problems such as gender inequality, complementarity, the domestic/public divide, ritual and symbolic valuations and the division of labour will be considered in the context of cultural relativity. (Offered in even-numbered years.)

*Prerequisite(s):* 10.00 credits including (ANTH\*2160 or SOAN\*2400), (SOAN\*2120 or WMST\*3000)

#### ANTH\*3650 Prehistory of Canadian Native Peoples F (3-0) [0.50]

This is a course in Aboriginal studies which uses archaeological, ethno-historical and contemporary research to examine the culture and social organization of First Nations peoples in Canada from their early beginnings to European contact.

*Prerequisite(s):* ANTH\*2160, (ANTH\*2230 or ANTH\*2660)

*Restriction(s):* ANTH\*2650

#### ANTH\*3670 Indigenous Peoples: Global Context W (3-0) [0.50]

This course will focus on aboriginality as a political and cultural identity. Historical, political, and cultural similarities between indigenous peoples the world over will be traced and key issues such as assimilation, cultural survival, protection of the commons, and the environment and cultural identity within the nation state will be examined. International organizations of indigenous peoples will be considered as well as other forms of transnational assertions of common identity and resistance. (Offered in odd-numbered years.)

*Prerequisite(s):* (1 of ANTH\*2160, ANTH\*2230, ANTH\*2660, SOC\*2660, IDEV\*2010, IDEV\*2500), SOAN\*2120

#### ANTH\*3690 History of Anthropological Thought F (3-0) [0.50]

This course offers a historical survey of the main trends in anthropological theory from the 19<sup>th</sup> century to the present.

*Prerequisite(s):* ANTH\*2160, ANTH\*2230, SOAN\*2120

#### ANTH\*3770 Kinship and Social Organization W (3-0) [0.50]

This course will deal with the theoretical implications of the study of kinship systems for an analysis of human society in general, including a comparative study of the social organization of kinship-based societies.

*Prerequisite(s):* ANTH\*2160, ANTH\*2230, SOAN\*2120

#### ANTH\*3840 Seminar in Anthropology F,W (3-0) [0.50]

This course will be offered as a structured seminar on various topics depending upon the interests of the faculty member teaching the course. Topics will be announced and course outlines will be available at course selection. The availability of third and fourth year seminar courses will vary. Students must check with the Department of Sociology and Anthropology to see when seminar courses are available.

*Prerequisite(s):* 10.00 credits including ANTH\*2160, SOAN\*2120

#### ANTH\*3850 Seminar in Anthropology F,W (3-0) [0.50]

This course will be offered as a structured seminar on various topics depending upon the interests of the faculty member teaching the course. Topics will be announced and course outlines will be available at course selection. The availability of third and fourth year seminar courses will vary. Students must check with the Department of Sociology and Anthropology to see when seminar courses are available.

*Prerequisite(s):* 10.00 credits including ANTH\*2160, SOAN\*2120

#### ANTH\*3950 Special Projects in Anthropology S,F,W (3-0) [0.50]

This special study option/reading course is designed to provide advanced undergraduates with an opportunity to explore independently the frontiers and foundations of a field of knowledge. Under supervision, the student will study in greater depth topics related to regular upper-level courses offered in the department which the student has taken or is taking. Permission of the instructor who will be supervising the study is required.

*Prerequisite(s):* 10.00 credits

*Restriction(s):* Instructor consent required. Please note, a student is allowed a total of 1.00 credits only for reading courses.

#### ANTH\*4300 Anthropological Issues F (3-0) [0.50]

Current issues and future trends in the discipline of socio-cultural anthropology will provide the subject matter of this variable content course. This course is meant to provide an opportunity for socio-cultural anthropology majors to consider the latest developments in the sub-discipline. Course topics will be announced and course outlines will be available at course selection time.

*Prerequisite(s):* 12.50 credits including ANTH\*3690, SOAN\*3070

#### ANTH\*4440 Culture, Rights and Development W (3-0) [0.50]

This course examines the theoretical and practical problems associated with respecting local cultures while also respecting human dignity universally. Various definitions of 'development' will be explored in terms of how they reflect cultural values and global inequalities.

*Prerequisite(s):* 12.50 credits including ANTH\*3690, SOAN\*3070

#### ANTH\*4540 Seminar in Anthropology F,W (3-0) [0.50]

This course will be offered as a structured seminar on various topics depending upon the interests of the faculty member teaching the course. Topics will be announced and course outlines will be available at course selection. The availability of third and fourth year seminar courses will vary. Students must check with the Department of Sociology and Anthropology to see when seminar courses are available.

*Prerequisite(s):* 12.50 credits including (ANTH\*3690 or SOC\*3310), SOAN\*3070

**ANTH\*4640 Seminar in Anthropology F,W (3-0) [0.50]**

This course will be offered as a structured seminar on various topics depending upon the interests of the faculty member teaching the course. Topics will be announced and course outlines will be available at course selection. The availability of third and fourth year seminar courses will vary. Students must check with the Department of Sociology and Anthropology to see when seminar courses are available.

*Prerequisite(s):* 12.50 credits including (ANTH\*3690 or SOC\*3310), SOAN\*3070

**ANTH\*4700 Issues in Contemporary Anthropological Theory W (3-0) [0.50]**

This course critically examines current anthropological theories, which may include post-structuralism, post-modernism, neo-Marxism and processual approaches. Attention may also be given to the theoretical and political implications of constructionism and calls for ethnographic reflexivity.

*Prerequisite(s):* 12.50 credits including ANTH\*3690, SOAN\*3070

**ANTH\*4740 Seminar in Anthropology F,W (3-0) [0.50]**

This course will be offered as a structured seminar on various topics depending upon the interests of the faculty member teaching the course. Topics will be announced and course outlines will be available at course selection. The availability of third and fourth year seminar courses will vary. Students must check with the Department of Sociology and Anthropology to see when seminar courses are available.

*Prerequisite(s):* 12.50 credits including (ANTH\*3690 or SOC\*3310), SOAN\*3070

**ANTH\*4840 Seminar in Anthropology F,W (3-0) [0.50]**

This course will be offered as a structured seminar on various topics depending upon the interests of the faculty member teaching the course. Topics will be announced and course outlines will be available at course selection. The availability of third and fourth year seminar courses will vary. Students must check with the Department of Sociology and Anthropology to see when seminar courses are available.

*Prerequisite(s):* 12.50 credits including (ANTH\*3690 or SOC\*3310), SOAN\*3070

**ANTH\*4880 Special Projects in Anthropology S,F,W (3-0) [0.50]**

This special study/reading course option is designed to provide advanced undergraduates with an opportunity to explore independently the frontiers and foundations of a field of knowledge. Under supervision, the student will study in greater depth topics related to regular upper-level courses offered in the department which the student has taken or is taking. Permission of the instructor who will be supervising the project is required.

*Prerequisite(s):* 12.50 credits

*Restriction(s):* Instructor consent required. Please note, a student is allowed a total of 1.00 credits only for reading courses.

**ANTH\*4890 Special Projects in Anthropology S,F,W (3-0) [0.50]**

This special study/reading course option is designed to provide advanced undergraduates with an opportunity to explore independently the frontiers and foundations of a field of knowledge. Under supervision, the student will study in greater depth topics related to regular upper-level courses offered in the department which the student has taken or is taking. Permission of the instructor who will be supervising the project is required.

*Prerequisite(s):* 12.50 credits

*Restriction(s):* Instructor consent required. Please note, a student is allowed a total of 1.00 credits only for reading courses.

**ANTH\*4900 Honours Anthropology Thesis I S,F,W (3-0) [0.50]**

Development and design of an honours thesis proposal conducted under the supervision of a faculty member. Recommended to honours major students.

*Prerequisite(s):* 15.00 credits including ANTH\*3690, (SOAN\*3070 or SOAN\*3120)

*Restriction(s):* Instructor consent required. As well as a cumulative average of 70% in all Sociology and Anthropology courses.

**ANTH\*4910 Honours Anthropology Thesis II S,F,W (3-0) [0.50]**

Completion and presentation of honours thesis.

*Prerequisite(s):* ANTH\*4900

*Restriction(s):* Instructor consent required.

## Art History

### *School of Fine Art and Music*

*Students with a special interest in particular courses in Art History should consult the School concerning prerequisites.*

1. Some Art History lecture courses at the 2000- and 3000-level are offered on alternate years only and many Art History seminars have variable content. For course offerings and course descriptions please see the home page for the School of Fine Arts & Music [www.uoguelph.ca/sofam/](http://www.uoguelph.ca/sofam/)
2. Many Art History lecture courses are reading-intensive while seminar courses are writing and presentation-intensive.
3. Honours major students in Art History are required to take two 4000-level seminars (excluding ARTH\*4620), preferably in their 7th and 8th semesters. Please see the individual course descriptions for pre-requisites and restrictions for these courses.

#### **ARTH\*1220 The Visual Arts Today F (3-0) [0.50]**

An introduction to contemporary visual culture, its current controversies and its historical roots. The avant-grade movements of the modern period and the impact of new technologies and media will be examined within a rich historical context. Topics will include international exhibitions, selling art, art and popular culture, censorship, and the relation between words and images.

#### **ARTH\*1510 Art Historical Studies I F (3-0) [0.50]**

This course considers the visual arts in the Western tradition from prehistory through the Middle Ages. Emphasis will be placed on historical and critical analysis of key monuments and on the prerequisite technologies, as well as on various ways of looking at the visual past and present.

#### **ARTH\*1520 Art Historical Studies II W (3-0) [0.50]**

A consideration of the visual arts in the Western tradition. Emphasis will be placed on historical and critical analysis of key monuments and on the prerequisite technologies, as well as on various ways of looking at the visual past and present. Focus will be on the visual arts from the Renaissance to today.

#### **ARTH\*2050 Modern Latin American Art F (3-0) [0.50]**

This course is an exploration of Latin American art in the context of cultural, social and political experience, with emphasis on the work of the painter Frida Kahlo, the Mexican muralists, performance artists Guillermo Gomez-Pena and Coco Fusco, and other important contemporary artists who have represented identity, culture, and political experience as complex and multifaceted because they have lived between nations and cultures. (Offered in odd-numbered years.)

*Prerequisite(s):* 1 of ARTH\*1220, ARTH\*1510, ARTH\*1520

#### **ARTH\*2060 Aboriginal Arts in the Americas F (3-0) [0.50]**

An introduction to the aboriginal cultures of North, South, and Central America with special emphasis on the pre-contact period. The interdisciplinary approach will take into account recent debates about methodology, ethnocentricity, and aboriginal viewpoints.

*Prerequisite(s):* 1 of ARTH\*1220, ARTH\*1510, ARTH\*1520

#### **ARTH\*2070 Art of the USA W (3-0) [0.50]**

In art, the 20th century has been referred to as "The American Century." Artists in the USA have a tradition of creating new visual languages, of using new ideas and technologies, and of representing the vanguard. Where did these ideas originate, and how has the USA determined our notions of what art is? This survey course focuses on modern American artists, on the evolution and growth of modern visual culture, and on how technologies and societies impact on artistic taste.

*Prerequisite(s):* 1 of ARTH\*1220, ARTH\*1510, ARTH\*1520

#### **ARTH\*2120 Introduction to Museology W (3-0) [0.50]**

The course will examine the history of collections, traditions of cultural representation and display, constructions of authenticity, trade and exchange. (Offered in odd-numbered years.)

*Prerequisite(s):* 1 of ARTH\*1220, ARTH\*1510, ARTH\*1520

#### **ARTH\*2150 Art and Archaeology of Greece F (3-0) [0.50]**

A survey of Ancient Greek Art and Archaeology, with stress on form and function plus stylistic trends and aesthetic values. The course will illuminate the cultural, social, and political life in Ancient Greece. (Also listed as CLAS\*2150).

*Prerequisite(s):* 1 of ARTH\*1220, ARTH\*1510, ARTH\*1520

*Equate(s):* CLAS\*2150

#### **ARTH\*2280 Modern Architecture W (3-0) [0.50]**

An investigation of architectural theory and practice within the social and spatial complexities of national and international life.

*Prerequisite(s):* 1 of ARTH\*1220, ARTH\*1510, ARTH\*1520

#### **ARTH\*2290 History of Photographic Media S (3-0) [0.50]**

An introduction to the history of photography through to its application in contemporary visual arts. (Offered through Distance Education only.)

*Prerequisite(s):* 1 of ARTH\*1220, ARTH\*1510, ARTH\*1520

#### **ARTH\*2480 Introduction to Art Theory and Criticism F (3-0) [0.50]**

This course provides an overview of some of the most significant methodological approaches and critical practices used by art historians to write about visual culture. Traditional methods of art historical analysis include connoisseurship, iconography, and formalism. With these we will be exploring newer interpretative models and multidisciplinary approaches such as structuralism, semiotics, post-structuralism, and psychoanalytic theory as well as political theories such as feminism and socio-cultural theory. (Offered in odd-numbered years.)

*Prerequisite(s):* 2 of ARTH\*1220, ARTH\*1510, ARTH\*1520

#### **ARTH\*2490 History of Canadian Art F (3-0) [0.50]**

An overview of the visual arts in Canada from the earliest times to the present, with emphasis on the diverse contributions made by the First Nations, by French and British colonization, and by subsequent settlers from a great variety of different cultural origins.

*Prerequisite(s):* 1 of ARTH\*1220, ARTH\*1510, ARTH\*1520

#### **ARTH\*2540 Medieval Art F (3-0) [0.50]**

This course considers visual arts during a period when the Christian church built a new synthesis out of the legacies of the late Roman Empire and its "barbarian invaders".

*Prerequisite(s):* 1 of ARTH\*1220, ARTH\*1510, ARTH\*1520

#### **ARTH\*2550 The Italian Renaissance W (3-0) [0.50]**

This course will investigate the myths and realities of the Renaissance in the visual arts. The artists to be studied will include Giotto, Duccio, Ghiberti, Donatello, Alberti, the Bellini, Verrocchio and Michelangelo. Their careers will be placed against the theoretical beginnings of art writing and the intricate relationships of the emerging city-states of Siena, Florence, Milan, and the republic of Venice.

*Prerequisite(s):* 1 of ARTH\*1220, ARTH\*1510, ARTH\*1520

#### **ARTH\*2580 Late Modern Art: 1900-1950 F (3-0) [0.50]**

A study of the historical avant-gardes in the social and political contexts of the period 1900-1950. (Offered in even-numbered years.)

*Prerequisite(s):* 1 of ARTH\*1220, ARTH\*1510, ARTH\*1520

#### **ARTH\*2600 Early Modern Art to 1900 W (3-0) [0.50]**

A study of visual culture as it was transformed by the revolutions - industrial, political, and colonial - of the eighteenth and nineteenth centuries. (Offered in even-numbered years.)

*Prerequisite(s):* 1 of ARTH\*1220, ARTH\*1510, ARTH\*1520

#### **ARTH\*2950 Baroque Art W (3-0) [0.50]**

The visual arts in an age of religious crisis and the growth of great trading empires will be examined. (Offered in odd-numbered years.)

*Prerequisite(s):* 1 of ARTH\*1220, ARTH\*1510, ARTH\*1520

#### **ARTH\*3010 Contemporary Canadian Art W (3-0) [0.50]**

The wide range of contemporary Canadian visual arts, from painting to new technological media, from 'high' culture to punk, will be examined in the context of specifically Canadian social and historical conditions during the modern and post-modern periods.

*Prerequisite(s):* 10.00 credits including 2.00 credits in Art History.

#### **ARTH\*3050 Pre-Columbian Art W (3-0) [0.50]**

This course investigates the history and artistic traditions of pre-contact America with special focus on selected cultural areas. The course will bring together such perspectives as archaeology, art history and ethnography. (Offered in even-numbered years)

*Prerequisite(s):* 10.00 credits including 2.00 credits in Art History.

#### **ARTH\*3060 Public Art W (3-0) [0.50]**

This course investigates what constitutes the "public" and the "private" domain in the arenas of art and visual culture. Provocative iconography, matters of race, nationality, sexuality, language, and identity in artistic practice, issues of censorship, controversial shows and exhibitions, the ethics of propriety and impropriety will be considered. Artists such as Linda Montano, Andres Serrano, Keith Haring, Annie Sprinkle, Robert Mapplethorpe and others will be discussed. (Offered in odd-numbered years.)

*Prerequisite(s):* 10.00 credits including 2.00 credits in Art History.

#### **ARTH\*3100 Perspectives: Structure & Space in Western Art F (3-0) [0.50]**

This course investigates the visual arts in Europe with special emphasis on issues of illusionism, mimesis, and the representation of space. (Offered in even-numbered years.)

*Prerequisite(s):* 10.00 credits including 2.00 credits in Art History.



**ARTH\*3150 Space: Roman Art and Urbanism W (3-0) [0.50]**

Roman art and urbanism from the Early Republic to the end of the imperial period. The course will survey the developments of Roman art with an emphasis in architecture, sculpture and painting. It will illuminate the development of the urban space in the context of cultural, social and political life. (Also listed as CLAS\*3150). (Offered in even-numbered years.)

*Equate(s):* CLAS\*3150

*Restriction(s):* ARTH\*3530 , ARTH\*4500

**ARTH\*3200 Colour: Practice & Meanings in Western Art W (3-0) [0.50]**

This course explores the role colour has played in the work of selected artists and periods. (Offered in odd-numbered years.)

*Prerequisite(s):* 10.00 credits including 2.00 credits in Art History.

**ARTH\*3210 Critical Issues in Art History F (3-0) [0.50]**

This course investigates art and its histories. Art writing, art history, and art historical methodology will be examined through the work of key art historians, cultural critics, and philosophers such as Clement Greenberg, Rosalind Krauss, Griselda Pollock, and Jacques Derrida for example. Critical issues such as intention and reception, authorship, creativity and originality will be discussed. (Offered in odd-numbered years.)

*Prerequisite(s):* 10.00 credits including 2.00 credits in Art History.

**ARTH\*3220 Nationalism & Identity in Art F (3-0) [0.50]**

This course considers issues of identity formation and representation as they intersect with the agendas and interests of the nation state. The course looks at questions of power and exclusion, theories of representation and notions of centre/periphery, cultural hybridity and border-crossing in the age of globalization. It will examine the representation of identity in cultural institutions (including museums, and international art events) in cultural policy, and in cultural forms (fine art and popular culture, journals and periodicals). (Offered in even-numbered years.)

*Prerequisite(s):* 10.00 credits including 2.00 credits in Art History.

**ARTH\*3310 Image: Pictures & Their Power W (3-0) [0.50]**

This course examines the role that images play in conveying religious, political and aesthetic messages, and how these powerfully reveal themselves in forms of iconophobia and iconophilia. (Offered in even-numbered years.)

*Prerequisite(s):* 10.00 credits including 2.00 credits in Art History.

*Equate(s):* ARTH\*3540

**ARTH\*3320 Lives: Aspects of Western Art W (3-0) [0.50]**

This course examines how the theory and practice of art history has often been informed by biography and other constructions of stereotypes and social practices concerning the 'Artist', the artist's audiences, and the various contexts that inform artists' lives, real and imagined. (Offered in odd-numbered years.)

*Prerequisite(s):* 10.00 credits including 2.00 credits in Art History.

*Equate(s):* ARTH\*3550

**ARTH\*3330 Display: Visual Culture in Western Europe W (3-0) [0.50]**

This course examines the politics of visual representation in various contexts and how it shapes the meaning of artworks. An interpretation of culture through liturgical display, museums, cabinets of curiosities, tourist art, World's Fairs and shopping mall will be considered. (Offered in even-numbered years.)

*Prerequisite(s):* 10.00 credits including 2.00 credits in Art History.

*Equate(s):* ARTH\*3570

**ARTH\*3340 The Art Object & Material Culture F (3-0) [0.50]**

This course considers selected topics in the visual arts in Italy, Spain and France, with attention to questions of the political, social, economic, gendered, and aesthetic meanings of works of art. (Offered in odd-numbered years.)

*Prerequisite(s):* 10.00 credits including 2.00 credits in Art History.

*Equate(s):* ARTH\*3640

**ARTH\*3460 English Art, 1750 to Present F (3-0) [0.50]**

In conjunction with the London Semester, this course will survey the visual arts in England from the mid-18th century to the present. Visits to galleries, museums, libraries, studios, and other cultural institutions will supplement lectures and stress the experience of actual works of art.

*Prerequisite(s):* Admission to London Semester

**ARTH\*3520 Idea: Art Since 1950 F (3-0) [0.50]**

An analysis of the visual arts of painting, sculpture, photographic media and non-traditional media World War II to the present. Selected artists of North America and Western Europe will be considered, as well as the institutions of the art world.

*Prerequisite(s):* 10.00 credits including 2.00 credits in Art History

**ARTH\*3780 Gender and Art W (3-0) [0.50]**

This course considers how the practice and reception of the visual arts intersect with constructs of gender in contemporary and historical contexts. (Offered in odd-numbered years.)

*Prerequisite(s):* 10.00 credits including 2.00 credits in Art History.

**ARTH\*4310 Topics in Art & Visual Culture I W (3-0) [1.00]**

This seminar course is designed to explore one or more issues in Art and Visual Culture (the America's) depending on the expertise of the instructor. Students should consult the department for specific offerings.

*Prerequisite(s):* A minimum of 14.00 credits including 2.50 credits in Art History.

*Restriction(s):* ARTH\*4050

**ARTH\*4320 Topics in Art & Visual Culture II F (3-0) [1.00]**

This seminar course is designed to explore one or more issues in Art and Visual Culture (the America's) depending on the expertise of the instructor. Students should consult the department for specific offerings.

*Prerequisite(s):* A minimum of 14.00 credits including 2.50 credits in Art History.

*Restriction(s):* ARTH\*4060

**ARTH\*4330 Topics in Art & Visual Culture III W (3-0) [1.00]**

This seminar course is designed to explore one or more issues in Art and Visual Culture (Western Art) depending on the expertise of the instructor. Students should consult the department for specific offerings.

*Prerequisite(s):* A minimum of 14.00 credits including 2.50 credits in Art History.

*Restriction(s):* ARTH\*4150 Registration is limited to students registered in the Art History or Studio Art specializations with an average of 70% in all ARTH and SART course attempts.

**ARTH\*4340 Topics in Art & Visual Culture IV F (3-0) [1.00]**

This seminar course is designed to explore one or more issues in Art and Visual Culture (Western Art) depending on the expertise of the instructor. Students should consult the department for specific offerings.

*Prerequisite(s):* A minimum of 14.00 credits including 2.50 credits in Art History.

*Restriction(s):* ARTH\*4160 Registration is limited to students registered in the Art History or Studio Art specializations with an average of 70% in all ARTH and SART course attempts.

**ARTH\*4350 Topics in Art & Visual Culture V F (3-0) [1.00]**

This seminar course designed to explore one or more issues in Art and Visual Culture (Questions in Criticism) depending on the expertise of the instructor. Students should consult the department for specific offerings.

*Prerequisite(s):* A minimum of 14.00 credits including 2.50 credits in Art History.

*Restriction(s):* ARTH\*4550 Registration is limited to students registered in the Art History or Studio Art specializations with an average of 70% in all ARTH and SART course attempts.

**ARTH\*4600 Individual Study - Art History S,F,W (3-0) [0.50]**

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

*Restriction(s):* This course is available with the approval of the Director for students who have completed their 5th semester and for whom there is no suitable course available.

**ARTH\*4620 Museum Studies F (3-0) [0.50]**

This seminar course will be offered in conjunction with the staff and facilities of the Macdonald Stewart Art Centre and will deal with historical matters relating to the role of the art museum in western life and the critical day-to-day management of a contemporary one. Students will participate, when possible, in the preparation of a current or forthcoming exhibition in the Centre.

*Prerequisite(s):* A minimum of 14.00 credits including 2.50 credits in Art History.

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations with an average of 70% in all ARTH and SART course attempts.

**ARTH\*4800 Experiential Learning F,W (3-0) [0.50]**

This course provides an opportunity for independent study based on Art History related voluntary or paid experience. Evaluation will be based on the student's performance on related work assignments at the host institution as well as any assignments determined by the relevant instructor. Written proposals/rationales, signed by the appropriate instructor, must be submitted to the Director of the School for approval by the last day of course selection in the Fall (for Winter) or Winter (for the following Fall semester).

*Prerequisite(s):* A minimum of 14.00 credits including 2.50 credits in Art History.

*Restriction(s):* Registration is limited to students registered in BA:ARTH specializations with a minimum cumulative average of 70% in all Art History course attempts. Instructor consent is required.

**ARTH\*4850 Honours Thesis I S,F,W (0-9) [0.50]**

Under the guidance of a faculty member over two semesters (ARTH\*4850 in the first semester and ARTH\*4860 in the second semester), the honours student will research and complete a major independent project in art history or criticism for final approval by a faculty member. Recommended for all honours students.

*Restriction(s):* Registration in semester 7 or 8 and a cumulative average of 70% in Studio and Art History courses. Instructor consent and approval of the Director required.

**ARTH\*4860 Honours Thesis II S,F,W (0-9) [0.50]**

Under the guidance of a faculty member over two semesters (ARTH\*4850 in the first semester and ARTH\*4860 in the second semester), the honours student will research and complete a major independent project in art history or criticism for final approval by a faculty member. Recommended for all honours students.

*Prerequisite(s):* ARTH\*4850

*Restriction(s):* Instructor consent and approval of the Director required.

## Arts and Sciences

*Dean's Office, College of Arts*

*Registration in ASCI\* courses is limited to students in the Bachelor of Arts and Sciences degree program.*

### **ASCI\*1000 Society and Science I: Historical Perspectives F (3-0) [0.50]**

This course explores historically the complex interrelations between science and society. It focuses on the ways in which science has both shaped, and been shaped by, its larger social and cultural contexts.

*Restriction(s):* HIST\*1250. Registration in the Bachelor of Arts and Sciences degree program.

### **ASCI\*1010 Society and Science II: Current Issues W (3-0) [0.50]**

This interdisciplinary course examines scientific and technological activities in modern society, including a number of current controversies. Case studies and debates will be used to examine the multiplicity of impacts and reactions to these activities.

*Prerequisite(s):* ASCI\*1000

*Restriction(s):* Registration in the Bachelor of Arts and Sciences degree program.

### **ASCI\*2000 Modes of Inquiry and Communication Across Disciplines F (3-0) [0.50]**

This course considers the process of inquiry and quest for knowledge in the natural and applied sciences, and the social sciences and humanities as they are constituted as disciplines within the modern university. The course will consider the social forces that shape inquiry, including funding for research, and consider the communication of findings, both inside and outside the academy.

*Prerequisite(s):* ASCI\*1000

*Restriction(s):* Registration in the Bachelor of Arts and Sciences degree program.

### **ASCI\*3000 Arts and Sciences Community Project F (3-0) [0.50]**

This course integrates the curricular, co-curricular and cross-disciplinary strands of the Arts and Sciences program through continued academic study and its application, modification, and critique in a community context. Students will conduct research and seminars on a selected topic while simultaneously completing a placement in a community agency appropriate to that topic. (See the B.A.S. program website for topics.)

*Prerequisite(s):* ASCI\*2000

*Restriction(s):* Registration in the Bachelor of Arts and Sciences degree program.

### **ASCI\*3100 Case Studies in Arts and Sciences Research W (3-0) [0.50]**

This variable-content course introduces students to case studies in the integration of academic knowledge and practices with social movements, investigating the ways in which cultural, social, and scientific endeavours meet to work on real-world problems. The course may contain both historical and current case studies.

*Prerequisite(s):* ASCI\*2000

*Restriction(s):* Registration in the Bachelor of Arts and Sciences degree program.

### **ASCI\*3700 Independent Studies in Arts/Sciences S,F,W (3-0) [0.50]**

This course offers an opportunity for individual students to pursue unique curricular opportunities when they arise and are approved as appropriate to B.A.S. students (e.g., independent reading and/or research under a faculty member's supervision in a research lab or program; a course taken while studying on exchange or abroad; a course developed in conjunction with experiential learning situations, etc.). See the B.A.S. website for learning contracts and other requirements that must be completed well in advance to permit registration for independent studies.

*Prerequisite(s):* A minimum of 9.00 credits.

*Restriction(s):* Registration in the Bachelor of Arts and Sciences degree program.  
Instructor consent required.

### **ASCI\*4000 Arts and Sciences Honours Seminar F (3-0) [0.50]**

This senior-level integrating course builds on the principles learned in ASCI\*2000, and requires research into an area of investigation relevant to the interdisciplinary focus of the program. Students will examine a topic from multiple theoretical and disciplinary perspectives, explore appropriate methodological approaches, prepare working bibliographies and annotations, and report on research. Students who take ASCI\*4010 will build on work completed in ASCI\*4000.

*Prerequisite(s):* 12.00 credits including ASCI\*2000

*Restriction(s):* Registration in the Bachelor of Arts and Sciences degree program.

### **ASCI\*4010 Arts and Sciences Honours Research Seminar W (3-0) [0.50]**

Under faculty supervision students will plan, develop, peer-edit and complete a major paper on a research topic developed in ASCI\*4000 or revised therefrom. Designed to function as a senior-level writing seminar, this course is particularly recommended to students who plan to pursue graduate study and who have a cumulative average of at least 75%.

*Prerequisite(s):* ASCI\*4000

*Restriction(s):* Registration in the Bachelor of Arts and Sciences degree program.

### **ASCI\*4020 Topics in Arts and Sciences Research F,W (3-0) [0.50]**

This variable-content course provides a senior-level seminar experience in the conduct, presentation, and writing of research relevant to the interdisciplinary core of the Bachelor of Arts and Sciences degree program. (See the B.A.S. website for topics.)

*Prerequisite(s):* 12.00 credits including ASCI\*2000

*Restriction(s):* Registration in the Bachelor of Arts and Sciences degree program.

### **ASCI\*4030 Topics in Arts and Sciences Research F,W (3-0) [0.50]**

This variable-content course provides a senior-level seminar experience in the conduct, presentation, and writing of research relevant to the interdisciplinary core of the Bachelor of Arts and Sciences degree program. (See the B.A.S. website for topics.)

*Prerequisite(s):* 12.00 credits including ASCI\*2000

*Restriction(s):* Registration in the Bachelor of Arts and Sciences degree program.

### **ASCI\*4700 Independent Studies in Arts/Sciences S,F,W (3-0) [0.50]**

This course offers an opportunity for individual students to pursue unique curricular opportunities when they arise and are approved as appropriate to B.A.S. students (e.g., independent reading and/or research under a faculty member's supervision in a research lab or program; a course taken while studying on exchange or abroad; a course developed in conjunction with experiential learning situations, etc.) See the B.A.S. website for learning contracts and other requirements that must be completed well in advance to permit registration for independent studies.

*Prerequisite(s):* A minimum of 14.00 credits.

*Restriction(s):* Registration in the Bachelor of Arts and Sciences degree program.  
Instructor consent required.

### **ASCI\*4710 Independent Studies in Arts/Sciences S,F,W (3-0) [0.50]**

This course continues work undertaken in ASCI\*4700, and will normally be planned in concert with planning for ASCI\*4700. This course offers an opportunity for individual students to pursue unique curricular opportunities when they arise and are approved as appropriate to B.A.S. students. See the B.A.S. website for learning contracts and other requirements that must be completed well in advance to permit registration for independent studies.

*Prerequisite(s):* ASCI\*4700

*Restriction(s):* Registration in the Bachelor of Arts and Sciences degree program.  
Instructor consent required.

## Biochemistry

*Department of Molecular and Cellular Biology*

### **BIOC\*2580 Introduction to Biochemistry S,F,W (3-3) [0.50]**

This course introduces students to the evolution, chemical structure, and biological roles of the major molecular components of the cell: including proteins, nucleic acids, lipids, and carbohydrates. Topics and processes integrated through understanding biological macromolecules include enzymology and intermediary metabolism, with emphasis on catabolic processes. Students will gain basic investigative skills through hands-on experiences in a laboratory setting.

*Prerequisite(s):* CHEM\*1050 or CHEM\*2300

### **BIOC\*3560 Structure and Function in Biochemistry F,W (3-0) [0.50]**

This course develops the understanding of biochemical processes by examining the molecular mechanisms underlying the regulation of specific cellular and physiological systems. Examples may include: oxygen binding and transport; regulation of enzyme function; carbohydrate and lipid metabolic pathways and metabolic integration; structure of membranes and membrane proteins; and membrane transport and signaling.

*Prerequisite(s):* BIOC\*2580

### **BIOC\*3570 Analytical Biochemistry S,F (3-4) [0.75]**

This course covers the tools and techniques by which biological molecules are isolated, separated, identified, and analyzed. Detailed discussion of experimental methods for macromolecule purification and characterization is included.

*Prerequisite(s):* (CHEM\*2400 or CHEM\*2480), BIOC\*2580

*Restriction(s):* MICR\*3110

### **BIOC\*4520 Metabolic Processes F (3-0) [0.50]**

This course is an in-depth study of the role of bioenergetics, regulation, and chemical mechanisms in carbohydrate, lipid, and nitrogen metabolism.

*Prerequisite(s):* BIOC\*3560 or BIOC\*3570

### **BIOC\*4540 Enzymology W (3-3) [0.75]**

This is a laboratory-intensive course where the topics studied include enzyme active sites and the mechanisms of enzyme action; enzyme kinetics and regulation; recombinant proteins and site-directed mutagenesis as tools for understanding enzymes.

*Prerequisite(s):* BIOC\*3560 (may be taken concurrently), BIOC\*3570

### **BIOC\*4580 Membrane Biochemistry W (3-0) [0.50]**

This course is a molecular examination of the structure and functions of cell membranes, cell surfaces and associated structures. Topics may include: membrane lipids; membrane protein structure; membrane transporters; ATP production; cytoskeleton; cell surface carbohydrates; membrane biogenesis; signal transduction.

*Prerequisite(s):* BIOC\*3560 or BIOC\*3570

## Biology

*Department of Human Health and Nutritional Sciences*

*Department of Integrative Biology*

*Department of Molecular and Cellular Biology*

*Department of Plant Agriculture*

### **BIOL\*1020 Introduction to Biology F (3-2) [0.50]**

This course will introduce important concepts concerning the organization of life, from cells to ecosystems. The dynamic and interactive nature of all living systems will be emphasized. This course will be valuable for students without Grade 12 or 4U Biology who are interested in environmental issues, medicine, advances in biotechnology and related topics. Department of Integrative Biology.

*Restriction(s):* BIOL\*1030, BIOL\*1040, BIOL\*1070, BIOL\*1080, BIOL\*1090

### **BIOL\*1030 Biology I F (3-3) [0.50]**

A lecture and laboratory course which introduces the concepts and controversies in contemporary biology and their implications. Using an integrative approach, the course examines some of the basics of biology and two of the common challenges of life, acquisition and processing of nutrients and information flow. How these challenges are faced by animals, microbes and plants and the diversity of structures and processes that have evolved in response to them will be discussed. This is the first course in a two course biology series. Material from BIOL\*1030 will be referred to in BIOL\*1040 to emphasize the integrated nature of biology. Students lacking Grade 12 or 4U Biology should consult with their program counsellor prior to taking BIOL\*1030.

*Restriction(s):* Registration in the B.B.R.M.

*Location(s):* Kemptville, Ridgetown

### **BIOL\*1040 Biology II W (3-3) [0.50]**

A continuation of BIOL\*1030. A lecture and laboratory course which continues with additional challenges of life faced by animals, microbes and plants and the diversity of structures and processes that have evolved in response to them. To indicate the value of biology to society, some topical issues in biology will be addressed. Materials introduced in BIOL\*1030 will be built on and referred to in BIOL\*1040.

*Prerequisite(s):* BIOL\*1030

*Restriction(s):* Registration in the B.B.R.M.

*Location(s):* Kemptville, Ridgetown

### **BIOL\*1070 Discovering Biodiversity F,W (3-0) [0.50]**

This course strongly emphasizes the development of learning and reasoning skills, an understanding of the nature of biological inquiry, and key concepts in evolution, ecology, and organismal biology. These include the meaning and significance of biodiversity and current issues surrounding it, the evolutionary processes through which biological diversity originates and is interrelated, the complexity of organisms and the importance of physical organization and regulatory processes, and the nature of interactions among organisms and between organisms and their biotic and abiotic environments. Students lacking Grade 12 or 4U Biology should consult with their program counsellor prior to taking BIOL\*1070 in first semester.

*Restriction(s):* BIOL\*1030, BIOL\*1040

### **BIOL\*1080 Biological Concepts of Health F,W (3-1) [0.50]**

This course will define the physiology of the individual as the biological foundation of health and focus on selected studies of health and illness in the adult human. Students will derive an understanding of the biological foundation of their own health as an adult and will be encouraged to expand the concepts and processes of individual health to human populations, animals and the environment. Through lectures, laboratories, small group tutorials and an individual research project, students will gain an introduction to research in the health sciences. Students lacking Grade 12 or 4U Biology should consult with their program counsellor prior to taking BIOL\*1080 in first semester.

*Restriction(s):* BIOL\*1030, BIOL\*1040

### **BIOL\*1090 Introduction to Molecular and Cellular Biology F,W (3-0) [0.50]**

This course will foster an understanding of key concepts in molecular and cell biology and genetics including evolution, relationship between structure and function, energy and regulation, interrelatedness of life, and the nature of science. By relating these concepts to their daily lives, through analysis of problems and tutorial discussions, students will develop an understanding of five central themes: 1) all living things share common properties, 2) the cell is the fundamental functional unit of life, 3) managing energy is central to success, 4) genes are the fundamental information unit of life, and 5) heredity. Students lacking Grade 12 or 4U Biology should consult with their program counsellor prior to taking BIOL\*1090 in first semester.

*Restriction(s):* BIOL\*1030, BIOL\*1040

### **BIOL\*1500 Humans in the Natural World S,F,W (3-0) [0.50]**

This course will examine past and present human interactions with Nature from an ecological perspective. It investigates current global issues that require multi-disciplinary environmental analysis. Department of Integrative Biology. (Also offered through Distance Education format.)

*Equate(s):* ZOO\*1500

*Restriction(s):* Students in the B.Sc. program cannot take this course for credit. This course may not count toward the requirements for the biology minor.

### **BIOL\*2060 Ecology F,W (3-1) [0.50]**

This is a basic course that presents a discussion of the ecology of plants, animals, fungi and bacteria as individual organisms, interacting populations, communities and ecosystems. Lectures and discussion groups are used to demonstrate the tremendous difficulty of interpreting ecological data derived from field studies. The value of laboratory-based research in ecology will also be discussed. The course will be important for anyone who wishes to understand what we know and need to know about the way ecological systems work. Department of Integrative Biology. (Also offered through Distance Education format.)

*Prerequisite(s):* 4.00 credits including (BIOL\*1040 or BIOL\*1070)

*Restriction(s):* BIOL\*3110, BIOL\*3120

### **BIOL\*2250 Biostatistics and the Life Sciences W (3-2) [0.50]**

This course in biostatistical methods will emphasize the design of research projects, data gathering, analysis and the interpretation of results. Statistical concepts underlying practical aspects of biological research will be acquired while working through the process of scientific enquiry. Computer laboratory sessions will focus on practical data visualization and statistical analysis using statistical software. Basic statistical methods are reviewed, followed by more advanced topics that will include some or all of the following: two-factor and multi-factor Analysis of Variance (ANOVA), simple and multiple linear regression, analysis of covariance, the general linear model, contingency table analysis and logistic regression. Concepts related to study design that will be discussed include sampling, confounding, paired designs, blocked designs, and factorial treatment designs.(Also listed as STAT\*2250.) Department of Integrative Biology and Department of Mathematics and Statistics.

*Prerequisite(s):* STAT\*2040

*Equate(s):* STAT\*2250

*Restriction(s):* STAT\*2050, STAT\*2090

### **BIOL\*3010 Laboratory and Field Work in Ecology F (0-6) [0.50]**

This course emphasizes field and laboratory work in ecology. Students will gain experience in experimental designs, sampling, analysis and interpretation of data collected to answer ecological questions. Local field sites will be used to run in-course experiments. Critical thinking about ecological issues relevant to society will be emphasized. Department of Integrative Biology.

*Prerequisite(s):* (BIOL\*1040 or BIOL\*1070), STAT\*2040

*Co-requisite(s):* BIOL\*2060 or BIOL\*3110

### **BIOL\*3020 Population Genetics F (3-2) [0.50]**

This course is designed to explore the concepts of random mating, inbreeding, random drift, assortative mating and selection as they relate to natural populations. The dynamic genetic structure of populations and its relationship to the process of speciation is examined. The role and significance of molecular genetics as it relates to population genetics, evolution, systematics and phylogeny is also considered. Department of Integrative Biology.

*Prerequisite(s):* MBG\*2000 or MBG\*2040

*Equate(s):* MBG\*3000

### **BIOL\*3050 Mycology W (3-3) [0.50]**

This course provides an introduction to the fungal lifestyle and to classification and evolution of the major groups of fungi, including microfungi, yeasts and other eukaryotic microbes. The characteristics of fungal cell structure, genetics and metabolism will be presented, and fungal reproduction and sporulation processes discussed with reference to the life cycles of representative forms. The ecological and economic importance of fungi will be demonstrated by considering fungal ecology, symbiotic relationships, mycotoxins and pathogenic fungi and industrial applications of fungi and yeasts. Laboratory work will provide familiarity with procedures for culturing, examining and identifying fungi and yeasts. Department of Molecular and Cellular Biology.

*Prerequisite(s):* 1 of BOT\*2100, MICR\*2030, MICR\*2430

**BIOL\*3110 Population Ecology F,W (3-1) [0.50]**

An exploration of the structure and dynamics of animal and plant populations. The first part of the course will focus on demographic characteristics of populations and simple models of population growth and natural regulation. The second part of the course will concentrate on a variety of population processes, including predator-prey interactions, spatial dynamics, and disease-host interactions, and consider how these processes affect population dynamics. A quantitative approach emphasizing the use of mathematical models, graphical analysis, and statistics will provide the basic conceptual framework, which will be illustrated by selected case studies. Department of Integrative Biology.

*Prerequisite(s):* (MATH\*1080 or MATH\*1200), STAT\*2040

**BIOL\*3120 Community Ecology W (3-1) [0.50]**

A course on the structure and dynamics of communities, dealing with both theoretical and applied aspects of community ecology. Emphasis is on the modern quantitative view of community ecology, and on the development of problem-solving skills. Department of Integrative Biology.

*Prerequisite(s):* BIOL\*3110

**BIOL\*3130 Conservation Biology W (3-0) [0.50]**

This course is an introduction to the biological basis for conserving wild, living resources, including freshwater and marine fish, plants and wild life. Topics to be covered include principles of population, community and landscape genetics and ecology relevant to the conservation, restoration and management of endangered species, ecosystems and/or renewable resources, including an introduction to the theory and practice of sustained-yield harvesting. Department of Integrative Biology.

*Prerequisite(s):* BIOL\*2060 or BIOL\*3110

**BIOL\*3300 Applied Bioinformatics W (3-2) [0.50]**

This course covers current methods for making use of large molecular data sets to identify the genes that control traits, to characterize genes' functions, and to infer genetic relationships among individuals. It focuses on case studies and current research in agriculture and medicine to introduce molecular data analysis methods, including analyzing molecular markers, constructing nucleotide and protein sequence alignments, constructing phylogenies, and finding motifs and genes in biological sequences. Lab sessions include an introduction to Unix and Perl for the biologist and hands-on use of several molecular data analysis programs. Department of Plant Agriculture.

*Prerequisite(s):* (MBG\*2020 or MBG\*2040), STAT\*2040

**BIOL\*3400 Evolution F,W (3-0) [0.50]**

This course provides a comprehensive introduction to evolutionary biology, the historical development of the discipline, the extent and nature of genetic diversity, and the mechanisms of evolutionary change. Examination of adaptation and speciation, and the origins and patterns of biotic diversity through evolutionary time. Designed to integrate evolutionary theory with other fields of biology such as development, ecology and systematics. Department of Integrative Biology.

*Prerequisite(s):* 4.00 credits including (BIOL\*1090 or MBG\*2000 )

*Equate(s):* ZOO\*3300

**BIOL\*3450 Introduction to Aquatic Environments F (3-0) [0.50]**

This course provides an introduction to the structure and components of aquatic ecosystems, how they are regulated by physical, chemical and biological factors, and the impact of humans on these environments and their biota. Laboratory periods will centre around computer-based exercises and simulation of aquatic systems. Department of Integrative Biology.

*Prerequisite(s):* (BIOL\*1040 or BIOL\*1070), CHEM\*1050, (1 of IBIO\*2300 , ZOO\*2070 , ZOO\*2700 is strongly recommended)

**BIOL\*4010 Adaptational Physiology W (3-0) [0.50]**

This course examines adaptations of organisms to various aquatic and terrestrial environments. A mechanistic approach will be used to establish the strategies (anatomical, physiological, biochemical) of environmental adaptation. Examples will include adaptations of deep-sea and polar organisms, adaptations to salinity and desiccation challenges, oxygen availability, sensory adaptations and symbiotic adaptations. Department of Integrative Biology.

*Prerequisite(s):* ZOO\*3210

*Equate(s):* IBIO\*4010

**BIOL\*4040 Natural Resources Policy W (3-0) [0.50]**

This course provides an analysis of how political, economic, social and scientific factors interact to determine the policy underlying management of renewable and non-renewable natural resources provincially, nationally and internationally. The course will analyze current policies pertaining to fisheries, wild life, forestry, energy, water, minerals, international treaties and accords. Department of Integrative Biology.

*Prerequisite(s):* 15.00 credits

*Equate(s):* ZOO\*4050

*Restriction(s):* Registration in Semester 7 or 8.

**BIOL\*4100 Molecular Evolution and Phylogenetics F (2-2) [0.50]**

This course is designed to provide students with an appreciation for the uses of molecular data in the study of evolutionary processes. An overview of the principles of molecular data analysis using a phylogenetic approach will be given. In addition, the importance of incorporating evolutionary history into biodiversity research and other applied topics will be emphasized. Laboratory sessions will be devoted to practical training in analytical tools using specialized computer software, and for student presentation of independent research projects. The course will involve practical training in molecular data analysis using a phylogenetic approach and discussion of current topics from the primary literature. Department of Integrative Biology.

*Prerequisite(s):* (BIOL\*3020 or MBG\*3000 ) or (BIOL\*3400 or ZOO\*3300 )

**BIOL\*4110 Ecological Methods F (3-3) [0.75]**

An advanced course designed to present theoretical and practical aspects of research methods in ecology. Emphasis will be placed on experimental design, sampling, population estimation, statistical inference, and community characteristics of producers and consumers. Students will participate in research projects of their own design, and will gain experience in preparing research proposals, research papers and posters, and making oral presentations. Department of Integrative Biology.

*Prerequisite(s):* BIOL\*3010, BIOL\*3120, STAT\*2040

**BIOL\*4120 Evolutionary Ecology W (3-1) [0.50]**

This course is an examination of common ecological circumstances faced by plants and animals and the morphological, behavioral and life history characteristics that have evolved in response. Particular emphasis will be placed on evolutionary processes and on adaptive aspects of thermoregulation, foraging strategies, spatial distribution, social and reproductive strategies. The course will emphasize both the theoretical basis and the empirical evidence for ecological adaptation. There is a 1-hour seminar each week for class discussion of selected lecture topics. Department of Integrative Biology.

*Prerequisite(s):* BIOL\*3110, ( MBG\*2000 or MBG\*2040), (1 of BIOL\*3020 , BIOL\*3400, MBG\*3000 , ZOO\*3300 )

**BIOL\*4150 Wildlife Conservation and Management F (3-0) [0.50]**

This course builds on previous courses in population and community ecology to evaluate the long-term dynamics of threatened populations in the context of human intervention. The course will also provide a "hands-on" introduction to computer modeling, with application to contemporary issues in population ecology and resource management. Lectures will be drawn from the following topics: growth and regulation of populations, long-term persistence of ecological communities, harvesting, bio-economics, and habitat modification. Department of Integrative Biology.

*Prerequisite(s):* BIOL\*3110

*Restriction(s):* ZOO\*4110

**BIOL\*4350 Biology of Polluted Waters F (3-3) [0.50]**

This is a practical course in biology of disturbed waters, and toxicity of pollutants to aquatic life. It's designed to familiarize students with the characteristics of polluted ecosystems, best methods of field survey, and procedures for toxicity tests. Department of Integrative Biology.

*Prerequisite(s):* BIOL\*3450

*Equate(s):* ZOO\*4350

**BIOL\*4410 Field Ecology F (3-3) [0.75]**

This is a 12-day field course held in Algonquin Park, Ontario, during August. Students independently conduct and write reports about 2 research projects of their choice and design (in consultation with faculty members), on any of: vertebrate, invertebrate, or plant ecology, and/or behaviour, in terrestrial or aquatic habitats. Emphasis is placed upon students asking ecological questions, designing experiments, and then collecting data from intensive field work. There are no formal lectures, but an organizational meeting is held in the winter semester prior to the field course. The charge by the field station for room and board will be passed on to the student. Students are also responsible for their own transportation to and from the field station. A departmental application form must be submitted for approval at least 4 weeks prior to the last day of course selection for the Summer semester, and the signature of the course coordinator will be required to select the course. This course must be recorded as part of your Fall course selection and tuition and compulsory fees will be calculated accordingly. Students taking this course DO NOT use course numbers reserved for Ontario Universities Program in Field Biology. Detailed information is available from the Department of Integrative Biology.

*Prerequisite(s):* 0.5 credits in ecology

*Equate(s):* ZOO\*4410

*Restriction(s):* Instructor consent required.

**BIOL\*4610 Arctic Ecology F (1-6) [0.75]**

This three-week field course provides an opportunity to study the flora and fauna of marine, freshwater and terrestrial environments of the high Arctic. Based in the high Arctic, the course includes lectures, field exercises and student projects. An information session is held in January; students are required to register before March. Signature of course coordinator is required for course selection. Students are responsible for cost of food and transportation. This course must be recorded as part of your Fall course selection and tuition and compulsory fees will be calculated accordingly. Students taking this course DO NOT use course numbers reserved for Ontario Universities Program in Field Biology. Detailed information is available from the Department of Integrative Biology. (Offered in even-numbered years.)

*Prerequisite(s):* (BIOL\*1040 or BIOL\*1070), (BIOL\*2060 or BIOL\*3110)

*Equate(s):* ZOO\*4610

*Restriction(s):* Instructor consent required.

**BIOL\*4700 Field Biology S,F,W (1-6) [0.50]**

Students may apply for 2-week courses in the OUPFB (Ontario Universities Program in Field Biology). This program offers a diversity of field courses in biological subjects ranging from the Arctic to the Tropics, microbes to mammals, and covering marine, freshwater and terrestrial habitats. Costs include food and lodging and may include transportation. Detailed information is available from the Department of Integrative Biology.

*Prerequisite(s):* (BIOL\*1040 or BIOL\*1070), (BIOL\*2060 or BIOL\*3110)

*Equate(s):* ZOO\*4700

*Restriction(s):* Permission of the course coordinator. Instructor consent required.

**BIOL\*4710 Field Biology S,F,W (1-6) [0.25]**

Students may apply for 1-week courses in the OUPFB (Ontario Universities Program in Field Biology). This program offers a diversity of field courses in biological subjects ranging from the Arctic to the Tropics, microbes to mammals, and covering marine, freshwater and terrestrial habitats. Costs include food and lodging and may include transportation. Detailed information is available from the Department of Integrative Biology.

*Prerequisite(s):* (BIOL\*1040 or BIOL\*1070), (BIOL\*2060 or BIOL\*3110)

*Equate(s):* ZOO\*4710

*Restriction(s):* Permission of the course coordinator. Instructor consent required.

**BIOL\*4800 Field Biology S,F,W (1-6) [0.50]**

Students may apply for 2-week courses in the OUPFB (Ontario Universities Program in Field Biology). This program offers a diversity of field courses in biological subjects ranging from the Arctic to the Tropics, microbes to mammals, and covering marine, freshwater and terrestrial habitats. Costs include food and lodging and may include transportation. Detailed information is available from the Department of Integrative Biology.

*Prerequisite(s):* (BIOL\*1040 or BIOL\*1070), (BIOL\*2060 or BIOL\*3110)

*Equate(s):* ZOO\*4800

*Restriction(s):* Permission of the course coordinator. Instructor consent required.

**BIOL\*4810 Field Biology S,F,W (1-6) [0.25]**

Students may apply for 1-week courses in the OUPFB (Ontario Universities Program in Field Biology). This program offers a diversity of field courses in biological subjects ranging from the Arctic to the Tropics, microbes to mammals, and covering marine, freshwater and terrestrial habitats. Costs include food and lodging and may include transportation. Detailed information is available from the Department of Integrative Biology.

*Prerequisite(s):* (BIOL\*1040 or BIOL\*1070), (BIOL\*2060 or BIOL\*3110)

*Equate(s):* ZOO\*4810

*Restriction(s):* Permission of the course coordinator. Instructor consent required.

**BIOL\*4900 Field Biology S,F,W (1-6) [0.50]**

Students may apply for 2-week courses in the OUPFB (Ontario Universities Program in Field Biology). This program offers a diversity of field courses in biological subjects ranging from the Arctic to the Tropics, microbes to mammals, and covering marine, freshwater and terrestrial habitats. Costs include food and lodging and may include transportation. Detailed information is available from the Department of Integrative Biology.

*Prerequisite(s):* (BIOL\*1040 or BIOL\*1070), (BIOL\*2060 or BIOL\*3110)

*Equate(s):* ZOO\*4900

*Restriction(s):* Permission of the course coordinator. Instructor consent required.

## Biomedical Sciences

### Department of Biomedical Sciences

Some Biomedical Science courses are Priority Access Courses and enrollment may be restricted to particular programs or specializations. See department for more information.

*Additional course listings may be found in the course descriptions for Toxicology and Veterinary Medicine.*

#### BIOM\*2000 Concepts in Human Physiology S,F,W (3-0) [0.50]

This is an introductory course that examines the fundamental integrative aspects of human physiological systems and their role in the maintenance of homeostasis. Course content is intended to serve the needs of non-bioscience students and includes the study of aspects of cellular metabolism, nerve and muscle function and general anatomy and function of the cardiovascular, respiratory, gastrointestinal, immune, central and peripheral nervous, endocrine, renal and reproductive systems. This course cannot be used to fulfill requirements for any biological science minor. (Offered through Distance Education format only.)

**Restriction(s):** ANSC\*3080, BIOM\*3100 , BIOM\*3200, HK\*3940, ZOO\*3200, ZOO\*3210. Not available to B.Sc. Students in biological science specializations.

#### BIOM\*3000 Functional Mammalian Neuroanatomy W (3-2) [0.50]

The main objective of the course is to understand the functional organization of the mammalian nervous system. It includes a review of the major cell types found in the nervous system and an overview of the basic physiological principles of brain function followed by a detailed three dimensional and histological examination of the mammalian brain and spinal cord. Emphasis is placed on understanding the relationship between anatomy, physiology and behaviour.

**Prerequisite(s):** 1 of BIOM\*3100 , BIOM\*3200, HK\*3940, PHYS\*2030, PSYC\*2410, ZOO\*3200

#### BIOM\*3010 Comparative Mammalian Anatomy F (2-3) [0.50]

This lecture and laboratory course examines the anatomy of mammals including humans. This course emphasizes the similarities of the basic mammalian plan. Evolutionary patterns, structure-function relationships and functional differences are considered.

**Prerequisite(s):** BIOL\*1040 or (BIOL\*1070, BIOL\*1080)

#### BIOM\*3040 Medical Embryology W (3-3) [0.75]

The patterns and principles of fertilization and normal embryonic and fetal development of mammalian organ systems are covered with a focus on the medical implications. The teratology of structural and functional prenatal anomalies in development is also discussed . There is an additional focus on developing scientific writing using evidence-based persuasive arguments and critical analysis of a primary research article.

**Prerequisite(s):** [BIOL\*1040 or (BIOL\*1070, BIOL\*1090)], (1 of BIOM\*3100 , BIOM\*3200, HK\*3940), (1of BIOM\*3010, HK\*3401/2, ZOO\*2090 is recommended)

#### BIOM\*3090 Principles of Pharmacology W (3-0) [0.50]

This course will introduce students to the basic principles of pharmacology. Topics to be covered include pharmacokinetics and drug-receptor interactions as well as the mechanism of action and toxicity of drugs acting on the cardiovascular and central nervous system.

**Prerequisite(s):** BIOC\*2580, (1of BIOM\*3110 , BIOM\*3200, HK\*3940, ZOO\*3200),

#### BIOM\*3200 Mammalian Physiology F (6-0) [1.00]

This course focuses on the normal functioning of mammals. The physiology of the nervous, endocrine, reproductive, cardiovascular and digestive systems and homeostasis as reflected in respiratory and renal function is treated in a detailed manner. The integrative nature of various physiological systems is highlighted and cellular and molecular information is incorporated to enhance the understanding of these systems. Aspects of medically significant changes in the mammalian physiological systems are also introduced.

**Prerequisite(s):** BIOC\*2580

**Equate(s):** BIOM\*3110

**Restriction(s):** BIOM\*3100 , HK\*3940

#### BIOM\*4030 Endocrine Physiology W (3-0) [0.50]

The course is designed to provide a senior level introduction to the endocrine discipline, focusing largely on mammals, with some examples taken from other vertebrate taxa. The course will give an introduction to the historical developments in the discipline, explore the actions of hormones and other chemical signalling pathways, and examine processes of hormone synthesis and secretion. The focus of the course will be the integrative nature of hormone actions in the regulations of various physiological processes in animal systems, such as metabolic control, growth, and reproduction. The course will also explore aspects of "non-classical" endocrinology, endocrine dysfunctional states and emerging environmental concerns related to endocrine dysfunction.

**Prerequisite(s):** BIOC\*2580, [1 of BIOM\*3100 , BIOM\*3200, HK\*3940, (ZOO\*3200, ZOO\*3210)]

#### BIOM\*4050 Biomedical Aspects of Aging F (3-0) [0.50]

Aging is accompanied by alterations in the physiological and biochemical functioning of body organ systems. The relationship between aging and the cardiovascular, respiratory, digestion/nutrition and reproductive systems will be discussed as will homeostatic functions associated with bone metabolism and fluid balance.

**Prerequisite(s):** 1 of BIOM\*3100 , BIOM\*3200, HK\*3940

#### BIOM\*4070 Biomedical Histology F (3-3) [0.75]

This histology course is designed for students interested in biomedical sciences. Basic tissue types and major organ systems of mammals will be examined using virtual microscopy. Lectures and discussions will focus on the relationship of tissue structure to cell and organ functions and the effects of injury or disease on microscopic structure.

**Prerequisite(s):** (1 of BIOL\*2210 , MCB\*2210 , MCB\*2050), (1of ANSC\*3080, BIOM\*3110 , BIOM\*3200, HK\*3940)

**Restriction(s):** BIOM\*3030 , ZOO\*3000. This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations. See department for more information.

#### BIOM\*4090 Pharmacology F (3-0) [0.50]

Topics covered in this course include drugs used in the treatment of inflammatory, allergic, hormonal, infectious, neoplastic and hemorrhagic/thromboembolic disease. The focus will be on drug targets and mechanisms of action that explain therapeutic and toxicological effects.

**Prerequisite(s):** BIOM\*3090

#### BIOM\*4110 Mammalian Reproductive Biology F (2-2) [0.50]

This multidisciplinary course provides an introduction to various aspects of mammalian reproduction of medical and veterinary significance. The course will cover the normal physiology and gross and micro anatomy of the female and male reproductive systems. Placentation, pregnancy and post-partum physiology will also be addressed. The impact of the reproductive biology on social and economic issues will be discussed.

**Prerequisite(s):** (1 of BIOM\*3010, HK\*3402, ZOO\*2090), (1 of BIOM\*3110 , BIOM\*3200, HK\*3940, ZOO\*3210), (1of BIOM\*3030 , BIOM\*4070, ZOO\*3000) Note: BIOM\*4070 can be taken as a co-requisite.

#### BIOM\*4150 Cancer Biology W (5-0) [0.50]

The main objective of this course is to familiarize students with general concepts in cancer biology. Each topic is presented as an overview, emphasizing recent developments in the field. There is additional focus on developing scientific skills, including critical analysis of current literature and the ability to give logical and concise oral presentations.

**Prerequisite(s):** BIOM\*3040, ( MBG\*2020 or MBG\*2040), ( MCB\*2210 or MCB\*2050), (1of BIOM\*3030 , BIOM\*4070, ZOO\*3000)

#### BIOM\*4180 Cardiology W (3-0) [0.50]

This course will explore the concepts and principles of normal heart function, with a focus on the molecular and cellular basis of cardiac physiology. These elements will be further developed by examining changes that occur in a range of cardiovascular diseases and conditions.

**Prerequisite(s):** (1of BIOM\*3110 , BIOM\*3200, HK\*3940), (1of BIOM\*3010, HK\*3401/2, ZOO\*2090)

**Restriction(s):** Registration in the B.Sc. Major in Bio-Medical Science.

#### BIOM\*4210 Principles & Practice of Health Sciences Research F (3-0) [0.50]

This course will explore a variety of issues related to the scientific ideals and practical realities of health sciences research. Topics will include critical reading of the medical literature, critical thinking, and selected issues related to scientific integrity such as authorship, plagiarism and fabrication of data.

**Prerequisite(s):** 14.00 credits

**Restriction(s):** HK\*4410 . Enrolment restricted to B.Sc. BIOM majors.

#### BIOM\*4220 Current Health Science Research W (0-6) [0.50]

In this course, students will explore various medical research initiatives by attending seminars, meeting with the investigators, and formulating and answering meaningful scientific questions. Students will be exposed to a variety of research seminar styles, develop scientific communication skills and gain experience in the peer-review process.

**Prerequisite(s):** BIOM\*4210 or HK\*4410

**Restriction(s):** Enrolment restricted to B.Sc. BIOM majors. Instructor consent required.



**BIOM\*4420 Research Modules W (0-6) [0.50]**

This course is taught as a series of hands-on modules on various research topics, techniques and approaches that are current in health science laboratories. This course is primarily aimed at students in the Neurosciences, Biomedical Sciences, Human Kinetics and Nutritional and Nutraceutical Sciences programs, who prefer a more structured approach to their research experience.

*Prerequisite(s):* 14.00 credits (1 of: BIOM\*3110 , BIOM\*3200, HK\*3940)

Recommended: BIOM\*4210 or HK\*4410

*Equate(s):* HK\*4420

*Restriction(s):* BIOM\*4510, BIOM\*4521/2, HK\*4360, HK\*4371/2. Instructor consent required.

**BIOM\*4500 Literature-based Research in Biomedical Sciences F (0-6) [0.50]**

This course involves independent literature research of a current topic in any of the biomedical sciences (such as anatomy, physiology, pharmacology, toxicology, genetics, biochemistry). Students will present critical appraisals of primary research literature and are required to submit an annotated bibliography and research proposal in addition to their publication-quality literature review paper. Students work under the supervision of individual faculty. Faculty consent must be obtained prior to being admitted into the course by the course coordinator.

*Prerequisite(s):* 12.00 credits

*Restriction(s):* HK\*4230 Instructor consent required. Enrolment restricted to B.Sc.

BIOM majors or B.Sc. NEUR minors.

**BIOM\*4510 Research in Biomedical Sciences S,F,W (0-12) [1.00]**

In this course students will conduct an individual research project on a current topic in any of the biomedical sciences (such as anatomy, physiology, pharmacology, toxicology, genetics, biochemistry). Students work under the supervision of individual faculty. Faculty consent must be obtained prior to being admitted into the course by the course coordinator.

*Prerequisite(s):* 14.00 credits

*Restriction(s):* BIOM\*4521/2. Instructor consent required. Enrolment restricted to

B.Sc. BIOM majors.

**BIOM\*4521 Research in Biomedical Sciences F (0-12) [1.00]**

This is the first part of the two-semester course BIOM\*4521/2. Refer to BIOM\*4521/2 for the complete course description.

*Prerequisite(s):* 14.00 credits

*Restriction(s):* BIOM\*4510. Instructor consent required. (This is a priority access course. Enrolment may be restricted to particular programs. See department for more information.)

**BIOM\*4521/2 Research in Biomedical Sciences F-W [2.00]**

In this course, students will conduct an extensive individual research project on a current topic in any of the biomedical sciences (such as anatomy, physiology, pharmacology, toxicology, genetics, biochemistry). Students work under the supervision of individual faculty. Students should make arrangements to find their own faculty advisor well in advance of course selection. A departmental registration form must be obtained from the course coordinator and signed by the faculty advisor before students can be admitted into the course. This is a two-semester course offered over consecutive semesters. When you select it you must select BIOM\*4521 in the first semester and BIOM\*4522 in the second semester. A grade will not be assigned in BIOM\*4521 until BIOM\*4522 has been completed.

*Prerequisite(s):* 14.00 credits

*Restriction(s):* BIOM\*4510. Instructor consent required. (This is a priority access course. Enrolment may be restricted to particular programs. See department for more information.)

**BIOM\*4522 Research in Biomedical Sciences W (0-12) [1.00]**

This is the second part of the two-semester course BIOM\*4521/2. Refer to BIOM\*4521/2 for the complete course description.

*Prerequisite(s):* BIOM\*4521.

## Botany

*Department of Integrative Biology*

*Department of Molecular and Cellular Biology*

*Department of Plant Agriculture*

*Additional course listings may be found in the course descriptions for Biology and Plant Biology.*

### **BOT\*1200 Plants and Human Use W (3-0) [0.50]**

This course will examine past and present interactions between humans and plants with emphasis on major changes in civilization and cultures as a result of these interactions. The approach will be to consider several case studies of how unique structural and chemical properties of various plant organs have played a role in their use by humans. Not an acceptable course for students in B.SC. Biological Sciences Programs. Department of Plant Agriculture. (Also offered through Distance Education format.)

*Restriction(s):* BIOL\*1030, BIOL\*1040

### **BOT\*2000 Plants, Biology and People W (3-0) [0.50]**

The course deals with the biology of plant species of historical and cultural importance. It will focus on plants used as a source of drugs, herbal medicines, industrial raw materials, food products, perfumes and dyes. Examples of plant products that will be looked at include cocaine, chocolate, tea, opium, hemp and ginseng. The relevant morphology, physiology, distribution and ethnobotany of these plant species will be discussed. (Offered through Distance Education format only.) Department of Plant Agriculture.

*Prerequisite(s):* BIOL\*1040

*Restriction(s):* BOT\*1200

### **BOT\*2100 Life Strategies of Plants F,W (3-3) [0.50]**

This course introduces the structures and processes used by plants in the greening of our planet, and how and why plants are basic to the functioning of the biosphere. This course includes hands-on experience in examining the cells, tissues and architectures of plants as well as selected processes of plant function. Department of Molecular and Cellular Biology.

*Prerequisite(s):* BIOL\*1040 or (2 of BIOL\*1070, BIOL\*1080, BIOL\*1090)

### **BOT\*3050 Plant Functional Ecology F (3-3) [0.50]**

This course integrates fundamental and applied aspects of plant ecology, focusing on the roles of functional traits, physiological mechanisms, life history strategies, abiotic constraints, and biotic interactions in influencing plant distribution and abundance. Specific topics include physiological ecology, growth and allocation patterns, influence of biotic and trophic interactions [pollinators, pathogens, herbivores, competitors, mutualists, decomposers] on the structure and function of plant communities, and effects of global environmental change. Labs will include a field component that explores variation in functional aspects of plants. This course is especially valuable for students interested in plant or wild life biology and environmental management. Department of Integrative Biology.

*Prerequisite(s):* 7.50 credits including (BIOL\*1040 or BIOL\*1070)

*Restriction(s):* BOT\*2050

### **BOT\*3310 Plant Growth and Development W (3-3) [0.50]**

In this course the unique function and structure of plants is explored in relation to their growth, survival and adaptation to the environment. The control of growth and development by environmental and hormonal signals is explained through lectures and "hands-on" laboratories. Department of Molecular and Cellular Biology.

*Prerequisite(s):* BIOL\*1040 or [(BIOL\*1090, (BIOL\*1070 or BIOL\*1080)]

### **BOT\*3410 Plant Anatomy F (3-3) [0.50]**

The intricate internal structure of plants is explored in this course. The development, pattern and significance of cells, tissues and organs will be emphasized as well as the histological and microscopical methods used to study them. The lab emphasizes interpretation of plant structure as it relates to function. Department of Molecular and Cellular Biology.

*Prerequisite(s):* BIOL\*1040 or (2 of BIOL\*1070, BIOL\*1080, BIOL\*1090)

### **BOT\*3710 Plant Diversity and Evolution W (3-3) [0.50]**

This course integrates mostly fundamental and applied aspects of plant evolution, focusing on the evolutionary history of plants, classification and identification, and hypotheses related to the evolution of plant form and life history. Specific topics include evolutionary process in plants and evolution of physiological, reproductive, behavioural, and morphological traits. Labs will focus on methods and contemporary tools for phylogenetic reconstruction, comparative analyses, identification, and basic morphology/anatomy. This course is especially valuable for students interested in plant or wild life biology and environmental management. Department of Integrative Biology.

*Prerequisite(s):* 7.50 credits including (BIOL\*1040 or BIOL\*1070)

### **BOT\*4380 Metabolism in the Whole Life of Plants W (3-0) [0.50]**

This course follows the developmental changes that take place in plants, and explores the molecular, biochemical and physiological mechanisms that are responsible for development. Emphasis will be placed on the importance of modern experimental methods and critical evaluation of data. Department of Molecular and Cellular Biology.

*Prerequisite(s):* (BIOL\*1040 or BIOL\*1090), BIOC\*2580

## Business

*Department of Business - College of Management and Economics*

### **BUS\*2090 Individuals and Groups in Organizations F,W (3-0) [0.50]**

The course serves as an overview to organizational behaviour. It examines the individual, the group, the organization and how the three interrelate in order to enhance performance and productivity. (Also offered through Distance Education format.) (Last offering - Winter 2014)

*Restriction(s):* BUS\*2000 , BUS\*4000 , HROB\*4000, HTM\*2200 , HTM\*4100 , HTM\*4390 , ISS\*2500

### **BUS\*3000 Human Resources Management F,W (3-0) [0.50]**

This course examines the essential human resource function of planning, staffing, employee training and development, employee assistance programs, the legal environment and employee maintenance in a variety of organizational settings. (Also offered through Distance Education format.) (Last offering - Winter 2015)

*Prerequisite(s):* 1 of ACCT\*2220, AGECE\*2220 , BUS\*2000 , BUS\*2090, BUS\*2220 , HTM\*2030, HTM\*2200

*Equate(s):* HTM\*3000

*Restriction(s):* PSYC\*3070. Priority Access course. Enrolment restricted to particular programs or specializations. See department for more information.

### **BUS\*3320 Financial Management F,W (3-0) [0.50]**

The viewpoint taken in the course is that of the senior financial officer of a business firm. The focus is on the management of cash, accounts receivable, inventory and short and intermediate term liabilities. Emphasis is placed on the analysis and forecasting of financial statements, and financial modeling for planning and controlling the growth of the business enterprise.

*Prerequisite(s):* 1 of ACCT\*2230, AGECE\*2230 , BUS\*2230 , HAFB\*3070 , HTM\*3070

*Equate(s):* AGECE\*3320

*Restriction(s):* Registration in B.Comm. programs, BA Management Economics programs, BA International Development area of emphasis Economic & Business Development or BA European Studies area of emphasis in European Business Studies.

### **BUS\*4250 Business Policy F,W (3-0) [0.50]**

Business policy is a synthesis of the principles of business management with emphasis upon the formation of business decisions and policies. The purpose of this course is to enable the student to draw on analytic tools and factual knowledge from all other courses in analyzing comprehensive business problems. (Last offering - Winter 2014)

*Prerequisite(s):* ( AGECE\*3310 or FARE\*3310), (1 of AGECE\*3320 , AGECE\*3400 , BUS\*3320, FARE\*3400), ECON\*3560

*Equate(s):* AGECE\*4250

*Restriction(s):* Registration in semester 6 or higher. Priority Access course. Enrolment may be restricted to particular programs or specializations. See department for more information.

### **BUS\*4550 Applied Business Project I S,F,W (3-0) [0.50]**

This is a project-based independent study course on a business issue for third or fourth year students in an agreed program of study with the instructor.

*Prerequisite(s):* 10.00 credits

*Restriction(s):* ( AGECE\*4550 or FARE\*4550). Instructor consent required.

### **BUS\*4560 Applied Business Project II S,F,W (3-0) [0.50]**

This course provides an opportunity to conduct a second independent study on a business issue for third or fourth year students in an agreed program of study with the instructor.

*Prerequisite(s):* BUS\*4550

*Restriction(s):* ( AGECE\*4560 or FARE\*4560). Instructor consent required.

## Chemistry

### Department of Chemistry

#### **CHEM\*1040 General Chemistry I F,W (3-3) [0.50]**

This course introduces concepts of chemistry, the central link between the physical and biological sciences. Principles discussed include chemical bonding, simple reactions and stoichiometry, chemical equilibria and solution equilibria (acids, bases, and buffers), and introductory organic chemistry.

*Prerequisite(s):* 4U Chemistry, (or equivalent) or CHEM\*1060

#### **CHEM\*1050 General Chemistry II F,W (3-3) [0.50]**

This course provides an introductory study of the fundamental principles governing chemical transformations: thermodynamics (energy, enthalpy, and entropy); kinetics (the study of rates of reactions); and redox/electrochemistry.

*Prerequisite(s):* CHEM\*1040

#### **CHEM\*1060 Introductory Chemistry F (3-0) [0.50]**

This course stresses fundamental principles of chemistry and is designed for students without Grade 12 or 4U Chemistry or equivalent. Topics include: atomic theory, the periodic table, stoichiometry, properties of gases and liquids, acid-base concepts and chemical equilibria. This course is intended only for students who require the equivalent of Grade 12 or 4U Chemistry in order to proceed to CHEM\*1040. (Offered through Distance Education only.)

#### **CHEM\*1100 Chemistry Today W (3-0) [0.50]**

This chemistry course for non-scientists will outline the involvement of chemistry in our daily lives and will provide an appreciation of chemistry from atoms to important complex molecules. Topics will include energy sources, air and water pollution, natural and synthetic polymers, household chemicals, foods, drugs and biochemicals. (Offered through Distance Education only.)

*Restriction(s):* CHEM\*1040

#### **CHEM\*2060 Structure and Bonding F (3-1.5) [0.50]**

This course covers the applications of symmetry, simple crystal structures and principles of bonding. Molecular orbital theory is used to explain the fundamental relationship between electronic and molecular structure. This course provides the elementary quantum background for an understanding of the electronic structures of atoms and molecules.

*Prerequisite(s):* CHEM\*1050, MATH\*1210, PHYS\*1010

#### **CHEM\*2070 Structure and Spectroscopy S,W (3-1.5) [0.50]**

This course provides an introduction to spectroscopy and its relationship to molecular structure and dynamics. Rotational, vibrational, electronic and magnetic resonance spectroscopies will be studied. Concepts introduced in CHEM\*2060 will be applied to chemical and biochemical problems through spectroscopic techniques. Central to this course is the use of spectroscopy for the determination of molecular structures and the investigation of molecular motions.

*Prerequisite(s):* CHEM\*2060

#### **CHEM\*2400 Analytical Chemistry I S,F,W (3-6) [0.75]**

This course provides instruction in quantitative analysis of important inorganic species in solution by volumetric, gravimetric and spectrophotometric techniques. The students will utilize spreadsheet applications to study solution equilibria and data analysis. This course is intended to build the foundations of good analytical laboratory practice.

*Prerequisite(s):* CHEM\*1050

*Restriction(s):* CHEM\*2480

#### **CHEM\*2480 Analytical Chemistry I S,F,W (3-3) [0.50]**

This course consists of a lecture portion that is the same as CHEM\*2400 and a 3 hour laboratory component.

*Prerequisite(s):* CHEM\*1050

*Restriction(s):* CHEM\*2400

#### **CHEM\*2700 Organic Chemistry I S,W (3-3) [0.50]**

This course is an introduction to organic chemistry, stereochemistry, discussion of the major mechanisms and related reactions: nucleophilic substitution and elimination, electrophilic addition, free radical reactions, electrophilic aromatic substitution, nucleophilic addition and nucleophilic acyl substitution.

*Prerequisite(s):* CHEM\*1050

*Restriction(s):* CHEM\*2300

#### **CHEM\*2820 Thermodynamics and Kinetics F (3-3) [0.50]**

This course examines the laws and applications of chemical thermodynamics and chemical kinetics.

*Prerequisite(s):* CHEM\*1050, (MATH\*1210 or MATH\*2080)

*Restriction(s):* CHEM\*2880

#### **CHEM\*2880 Physical Chemistry F (3-1.5) [0.50]**

This survey course is intended for students who are not specializing in chemistry or chemical physics. Topics include basic thermodynamics, chemical equilibrium, macromolecular binding, chemical kinetics, enzyme kinetics, transport processes, colligative properties and spectroscopy. This course describes macroscopic observable properties of matter in terms of molecular concepts.

*Prerequisite(s):* CHEM\*1050, (1 of MATH\*1000, MATH\*1080, MATH\*1200)

*Restriction(s):* CHEM\*2820

#### **CHEM\*3360 Environmental Chemistry and Toxicology S,W (3-0) [0.50]**

This course examines the chemistry of the natural environment and the influence of pollutants upon the environment. Topics will include methods of introduction of pollutants to, and removal of pollutants from, the environment. (Also listed as TOX\*3360.) (Also offered in Distance Education format)

*Prerequisite(s):* CHEM\*1050

*Equate(s):* TOX\*3360

#### **CHEM\*3430 Analytical Chemistry II: Instrumental Analysis S,W (3-3) [0.50]**

Methods for the separation, identification and quantification of substances in the solid, liquid and vapour states. Emphasis will be placed on modern instrumental methods and trace analysis.

*Prerequisite(s):* (CHEM\*2400 or CHEM\*2480), CHEM\*2070 (may be taken concurrently)

*Restriction(s):* TOX\*3300

#### **CHEM\*3440 Analytical Chemistry III: Analytical Instrumentation F (3-3) [0.50]**

Analytical Instrumentation, data acquisition, processing and applications in Chemistry and Biological Chemistry.

*Prerequisite(s):* CHEM\*3430

#### **CHEM\*3640 Chemistry of the Elements I F (3-3) [0.50]**

A comprehensive introduction to concepts used by inorganic chemists to describe the structure, properties, and reactivity of compounds of the main group elements. The most important concepts covered are: Electronic Structure of Atoms, Symmetry, MO theory, Acids and Bases, Structure of Solids, Trends in the Periodic System.

*Prerequisite(s):* CHEM\*2070

#### **CHEM\*3650 Chemistry of the Elements II W (3-3) [0.50]**

The chemistry and structure of transition metal compounds; electronic spectral and structural properties of transition metal complexes; mechanisms of their substitution and redox reactions. Introduction to organometallic chemistry.

*Prerequisite(s):* CHEM\*3640

#### **CHEM\*3750 Organic Chemistry II S,F (3-3) [0.50]**

A continuation of the coverage of fundamental aspects of organic chemistry using an assimilation of carbonyl chemistry, unsaturated systems and carbon-carbon bond forming processes to acquaint students with methods of organic synthesis. Topics also include an introduction to spectroscopic methods for the identification of organic compounds.

*Prerequisite(s):* CHEM\*2700

#### **CHEM\*3760 Organic Chemistry III W (3-3) [0.50]**

This course provides an in-depth treatment of various aspects of organic chemistry. This will include such topics as the chemistry of heterocycles, polar rearrangements, organic photochemistry, synthetic planning and a detailed discussion of organic spectroscopy.

*Prerequisite(s):* CHEM\*2070, CHEM\*3750

#### **CHEM\*3860 Quantum Chemistry F (3-1) [0.50]**

Elementary quantum mechanics for the understanding of the electronic structure of atoms and molecules.

*Prerequisite(s):* CHEM\*2070, MATH\*2170

#### **CHEM\*3870 Molecular Spectroscopy W (3-3) [0.50]**

This course covers elementary group theory with applications to molecular spectroscopy and provides a continuation of the topics of rotational, vibrational and electronic spectroscopy and their applications in chemistry from CHEM\*2070. (Offered in odd-numbered years.)

*Prerequisite(s):* CHEM\*2070, (MATH\*2150 or MATH\*2160)

#### **CHEM\*4010 Chemistry and Industry W (3-0) [0.50]**

This course examines industrial processes for the production of organic and inorganic chemicals. The environmental impact and the challenges of a large-scale operation will be considered alongside the actual chemical processes involved.

*Prerequisite(s):* (CHEM\*2300 or CHEM\*2700), (CHEM\*3430 or TOX\*3300), (MATH\*1210 or MATH\*2080)

**CHEM\*4400 Advanced Topics in Analytical Chemistry W (3-0) [0.50]**

Recent developments in instrumental methods of chemical analysis. A typical selection will include topics from the areas of surface analysis and the applications of lasers in chemical analysis.

*Prerequisite(s):* CHEM\*3430 or CHEM\*3450

**CHEM\*4620 Advanced Topics in Inorganic Chemistry F (3-0) [0.50]**

This course provides a contemporary treatment of subjects of current interest in modern inorganic chemistry. Possible topics include solid state chemistry, main group chemistry and organometallic chemistry.

*Prerequisite(s):* CHEM\*3650

**CHEM\*4630 Bioinorganic Chemistry W (3-0) [0.50]**

This course covers the role and importance of transition metal systems in biological processes. (Offered in odd numbered years.)

*Prerequisite(s):* BIOC\*2580, CHEM\*3650

*Co-requisite(s):* CHEM\*3650

**CHEM\*4720 Organic Reactivity W (3-0) [0.50]**

This course is an introduction to physical organic chemistry, including discussion of reactive intermediates, substituent effects, medium effects, the mechanisms of organic reactions and the theoretical description of the bonding in organic molecules. (Offered in even-numbered years.)

*Prerequisite(s):* CHEM\*3760

*Co-requisite(s):* CHEM\*3760

**CHEM\*4730 Synthetic Organic Chemistry F (3-0) [0.50]**

This course provides an introduction to synthetic organic chemistry, including discussion of retrosynthetic analysis, modern synthetic methods, organic reaction, and syntheses of natural products. The integration of these topics for the rational design of synthetic schemes will also be discussed.

*Prerequisite(s):* CHEM\*3750

**CHEM\*4740 Topics in Bio-Organic Chemistry F (3-0) [0.50]**

This course covers the principles, methods and techniques of current bio-organic chemistry with emphasis on modern synthetic and analysis methods applied to biological molecules, a molecular based approach to structure recognition, and an introduction to molecular modeling and drug design.

*Prerequisite(s):* BIOC\*2580, CHEM\*3750

**CHEM\*4880 Topics in Advanced Physical Chemistry W (3-0) [0.50]**

This course will cover selected topics in advanced physical chemistry. Possible topics include statistical thermodynamics, advanced quantum chemistry, spectroscopy, and magnetic resonance. (Offered in even-numbered years.)

*Prerequisite(s):* (CHEM\*2820 or PHYS\*3240), CHEM\*3860

**CHEM\*4900 Chemistry Research Project I S,F,W (0-12) [1.00]**

This research project and seminar in chemistry is designed to provide senior undergraduates with an opportunity to conduct research in an area of chemistry. Students must make arrangements with both a faculty supervisor and the course coordinator prior to registration. Students cannot choose a supervisor with whom they already have research experience in another capacity (e.g. a summer research position). The project supervisor must be a faculty member of the Chemistry Department. Students should note that most projects are of two semesters' duration, and should plan their studies on the expectation that they will also register in CHEM\*4910 in a subsequent semester.

*Prerequisite(s):* 5.00 credits in chemistry including (1.50 credits from CHEM\*3430, CHEM\*3640, CHEM\*3650, CHEM\*3750, CHEM\*3760, CHEM\*3870)

*Restriction(s):* Instructor consent required.

**CHEM\*4910 Chemistry Research Project II S,F,W (0-12) [1.00]**

This is a research project and seminar in chemistry. Students must make arrangements with both a faculty supervisor and the course coordinator prior to registration.

*Prerequisite(s):* CHEM\*4900

*Restriction(s):* Instructor consent required.

## Chinese

### *School of Languages and Literatures*

#### **CHIN\*1200 Introductory Chinese I F (3-0) [0.50]**

This introductory course in Mandarin Chinese provides the fundamentals of grammar, structure, and idiom, and due importance to the spoken language. This course is for students with no previous knowledge of the language.

*Restriction(s):* Students with native or near-native ability in Chinese will not be admitted to this course. Instructor consent required to verify student's level.

#### **CHIN\*1210 Introductory Chinese II W (3-0) [0.50]**

This course, a continuation of CHIN\*1200, emphasizes the application of basic grammatical structure in oral work and the comprehension of elementary reading texts. This course is intended for students who have only a basic knowledge of Mandarin Chinese.

*Prerequisite(s):* CHIN\*1200

#### **CHIN\*1280 Conversational Chinese I F (3-0) [0.50]**

The emphasis of this course is intensive practice of conversation and vocabulary acquisition in Mandarin Chinese.

*Restriction(s):* This course is restricted to students who are not fluent in Mandarin Chinese.

#### **CHIN\*1290 Conversational Chinese II W (3-0) [0.50]**

This is a continuation of CHIN\*1280. Additional emphasis will be given to the study of grammatical points in order to enhance listening and speaking skills.

*Prerequisite(s):* CHIN\*1280

*Restriction(s):* This course is restricted to students who are not fluent in Mandarin Chinese.

#### **CHIN\*2010 Chinese Language and Culture F (3-5) [1.00]**

This language course provides the application of basic grammatical structures in relation to conversational Mandarin (Chinese). The course may include the comprehension of elementary reading texts. The course focuses on Chinese, as a language, and its relation to understanding the culture of China. This course is offered as part of the Shanghai Semester.

*Prerequisite(s):* CHIN\*1200 or equivalent

*Restriction(s):* Admission to the Shanghai semester. Instructor consent required.

#### **CHIN\*2200 Intermediate Chinese I F (3-0) [0.50]**

This course supports the further development of the four basic language skills (speaking, writing, reading, and listening) acquired in previous Chinese Language courses and includes a survey of grammar, complex sentences and logical stress.

*Prerequisite(s):* CHIN\*1210

*Restriction(s):* Instructor consent required.

#### **CHIN\*2210 Intermediate Chinese II W (3-0) [0.50]**

This is a continuation of Intermediate Chinese I. Additional emphasis will be given to the study of Chinese characters and grammar.

*Prerequisite(s):* CHIN\*2200

*Restriction(s):* Instructor consent required.

## Classical Studies

### *School of Languages and Literatures*

*Unless otherwise noted, these courses do not require a knowledge of the Greek or Latin languages.*

#### **CLAS\*1000 Introduction to Classical Culture F,W (3-0) [0.50]**

This course provides a wide-ranging look at essential features of Greek and of Roman culture and society. Considerable emphasis will be given to the classical views of the human condition. (Winter semester offering in odd-numbered years.)

#### **CLAS\*2000 Classical Mythology W (3-0) [0.50]**

An examination of the nature and function of myth in Classical Antiquity. The course shows how the narrative and symbolic structure of myths orders individual and communal experience. The myths that have influenced Western civilization receive special emphasis.

#### **CLAS\*2150 Western Art: Greece F (3-0) [0.50]**

A survey of Ancient Greek Art and Archaeology, with stress on form and function plus stylistic trends and aesthetic values. The course will illuminate the cultural, social, and political life in Ancient Greece. (Also listed as ARTH\*2150).

*Equate(s):* ARTH\*2150

#### **CLAS\*2350 The Classical Tradition W (3-0) [0.50]**

This course examines the transmission of Graeco-Roman culture in circumstances radically different from those in which it originated. It highlights the aspects of classical culture most influential in forming the Western tradition. (Offered in odd-numbered years.)

*Prerequisite(s):* CLAS\*1000 or CLAS\*2000

#### **CLAS\*2360 The Classical Tradition (in Latin) W (6-0) [1.00]**

This course augments CLAS\*2350 for Classical Languages students through the reading and study in Latin of certain primary sources, in particular Cicero, Quintilian, Augustine. (Offered in odd-numbered years.)

*Prerequisite(s):* LAT\*2000

*Restriction(s):* Registration in Classical Languages.

#### **CLAS\*3000 The Rise and Fall of Athens F (3-0) [0.50]**

Greek history in the 5th century; the development of Athenian democracy; the Peloponnesian War and the decline of Athenian dominance. Special attention is paid to the literature and thought of the period. (Offered in even-numbered years.)

*Prerequisite(s):* 1 of CLAS\*1000, CLAS\*2000, HIST\*2850

#### **CLAS\*3010 The Roman Revolution W (3-0) [0.50]**

An examination of the collapse of the Roman Republic and the development of the Imperial government under Augustus. The paradox of the external power and inner instability of Rome. (Offered in even-numbered years.)

*Prerequisite(s):* 1 of CLAS\*1000, CLAS\*2000, HIST\*2850

#### **CLAS\*3020 History of the Hellenistic World F (3-0) [0.50]**

The rise and fall of the Hellenistic states from the death of Alexander the Great until the Roman conquest, with political emphasis on the development of the monarchies and cultural emphasis on the Hellenization of the East. (Offered in odd-numbered years.)

*Prerequisite(s):* 1 of CLAS\*1000, CLAS\*2000, HIST\*2850

#### **CLAS\*3030 Epic Heroes and Poems W (3-0) [0.50]**

The nature and significance of the epic hero. Epic as code and as critique of tradition. Oral poetry, and critical problems raised by it. The central texts are The Iliad, The Odyssey, and Virgil's Aeneid; other poems are also studied. (Offered in odd-numbered years.)

*Prerequisite(s):* CLAS\*1000 or CLAS\*2000

#### **CLAS\*3040 Greek Tragedy and Comedy W (3-0) [0.50]**

The nature of tragedy, and the existential and moral questions raised by the plays of Aeschylus, Sophocles, and Euripides. Comedy, fantasy, and society in Aristophanes. (Offered in even-numbered years.)

*Prerequisite(s):* CLAS\*1000 or CLAS\*2000

#### **CLAS\*3050 The Rise and Fall of Athens (in Greek) F (6-0) [1.00]**

This course augments CLAS\*3000 for Classical Languages students through the reading and study in Greek of selected primary sources, such as Herodotus, Thucydides, and Plutarch. (Offered in even-numbered years.)

*Prerequisite(s):* GREK\*2020

*Restriction(s):* Registration in Classical Languages.

#### **CLAS\*3060 The Roman Revolution (in Latin) W (6-0) [1.00]**

This course augments CLAS\*3010 for Classical Languages students through the reading and study in Latin of selected primary sources, notably Sallust, Cicero, Caesar, and Suetonius. (Offered in even-numbered years.)

*Prerequisite(s):* LAT\*2000

*Restriction(s):* Registration in Classical Languages.

#### **CLAS\*3070 History of the Hellenistic World (in Greek) F (6-0) [1.00]**

This course augments CLAS\*3020 for Classical Languages students through the reading and study in Greek of selected Greek sources pertaining to the history of the Hellenistic World, primarily Polybius and Plutarch. (Offered in odd-numbered years.)

*Prerequisite(s):* GREK\*2020

*Restriction(s):* Registration in Classical Languages.

#### **CLAS\*3080 Epic Heroes and Poems (in Greek) W (6-0) [1.00]**

This course augments CLAS\*3030 for Classical Languages students through the reading in Greek of selected books from the Iliad and/or Odyssey. The course will include close study of the epic dialect and features of its formulaic language. (Offered in odd-numbered years.)

*Prerequisite(s):* GREK\*2020

*Restriction(s):* Registration in Classical Languages.

#### **CLAS\*3090 Greek Tragedy and Comedy (in Greek) W (6-0) [1.00]**

This course augments CLAS\*3040 for Classical Languages students through the reading and study in Greek of an extant play. (Offered in even-numbered years.)

*Prerequisite(s):* GREK\*2020

*Restriction(s):* Registration in Classical Languages.

#### **CLAS\*3100 Religion in Greece and Rome F (3-0) [0.50]**

An examination of the varieties of religious experience and of religious activity in Greece and Rome, before the establishment of Christianity. Particular attention is paid both to the relations of religion to state and to the relations of the individual to gods. (Offered in even-numbered years.)

*Prerequisite(s):* CLAS\*1000 or CLAS\*2000

#### **CLAS\*3120 Religion in Greece and Rome (in Latin) F (6-0) [1.00]**

This course augments CLAS\*3100 for Classical Languages students through the reading and study of Latin primary sources. (Offered in even-numbered years.)

*Prerequisite(s):* LAT\*2000

*Restriction(s):* Registration in Classical Languages.

#### **CLAS\*3150 Space: Roman Art and Urbanism W (3-0) [0.50]**

Introduction to Roman art and urbanism from the Early Republic to the end of the imperial period. The course will survey the developments of Roman art with an emphasis on architecture, sculpture and painting. It will illuminate the development of the urban space in the context of cultural, social and political life. (Also listed as ARTH\*3150). (Offered in even-numbered years.)

*Equate(s):* ARTH\*3150

#### **CLAS\*3300 Directed Reading in Classical Languages U (3-0) [0.50]**

This course is designed for students of Classical Languages who are seeking an enriched learning opportunity, through directed reading and/or research in the original language (Greek or Latin). Consult the Classical Languages faculty advisor for information about this opportunity.

*Prerequisite(s):* [LAT\*2000, (1 of CLAS\*2350, CLAS\*3010, CLAS\*3100, CLAS\*4000)], or [GREK\*2020, (1 of CLAS\*3000, CLAS\*3020, CLAS\*3030, CLAS\*3040)]

*Restriction(s):* Registration in Classical Languages; instructor consent required.

#### **CLAS\*4000 Novel and Romance in Antiquity F (3-0) [0.50]**

The historical and formal roots of fiction in the classical prose romances. Special attention is paid to the influence of myth, religion, historiography and ethical biography. Among texts studied are Daphnis and Chloe, Satyricon, and Aithiopika. (Offered in odd-numbered years.)

*Prerequisite(s):* CLAS\*3030 or CLAS\*3040

#### **CLAS\*4010 Novel and Romance in Antiquity (in Latin) F (6-0) [1.00]**

This course augments CLAS\*4000 for Classical Languages students through the reading and study in Latin of an extant novel. (Offered in odd-numbered years.)

*Prerequisite(s):* LAT\*2000

*Restriction(s):* Registration in Classical Languages.

**CLAS\*4150 Research Paper in Classics F,W (3-0) [0.50]**

This course is intended to complement courses in specified studies in classics. It engages the student in research and in critical writing, and permits the examination, in depth, of a topic of importance to the discipline and of interest to the student.

*Prerequisite(s):* 1.50 credits in Classical Studies courses at the 3000 level

**CLAS\*4400 Seminar in Classics W (3-0) [0.50]**

A seminar course complementing courses of specific study in classics. It seeks to define the nature of the discipline, its values and its procedures. Attention will be paid to recent methodological and ideological trends in the discipline.

*Prerequisite(s):* 1.50 credits in Classical Studies at the 3000 level



## Computing and Information Science

### Department of Computing and Information Science

*Note: Credit may be obtained for 1 of CIS\*1000 or CIS\*1200. Students who major or minor in Computing and Information Science may not receive credit for the following courses unless taken to satisfy the requirements of another program: MATH\*1050.*

#### CIS\*1000 Introduction to Computer Applications S,F,W (3-2) [0.50]

This course provides a survey of computer systems and software, including an introduction to computer programming, data organization and the social impact of computing. The course contains an emphasis on application packages for personal and business use. Not recommended for students with previous computer science background. Cannot be taken for credit by students taking a major or minor in Computing and Information Science. (Also offered in Distance Education format.)

*Restriction(s):* CIS\*1200, Not available to students registered in B.A.Sc. Program (Applied Human Nutrition major)

#### CIS\*1200 Introduction to Computing F,W (3-2) [0.50]

This course covers an introduction to computer hardware and software, data organization, problem-solving and programming. The course includes exposure to application packages for personal and business use. For students who wish a balance between programming and the use of software packages. Cannot be taken for credit by students taking a major or minor in Computing and Information Science. (Also offered in Distance Education format.)

*Restriction(s):* CIS\*1000

#### CIS\*1250 Software Design I F (3-2) [0.50]

This is an introductory course which involves a general overview of design and problem solving as it is practiced in different disciplines. The course will include an examination of the qualities of software as the end product of the design process. It will include a study of the pervasiveness of software, and the platform specific considerations. The course has an applied focus and will involve software design and development experiences in teams, a literacy component, and the use of software development tools.

#### CIS\*1500 Introduction to Programming F,W (3-2) [0.50]

Introductory problem-solving, programming and data organization techniques required for applications using a general purpose programming language. Topics include control structures, data representation and manipulation, program logic, development and testing. For students who require a good understanding of programming or are planning on taking additional specialist Computing and Information Science courses. This is the entry point to all CIS programs. (Also offered in Distance Education format.)

*Restriction(s):* CIS\*1650

#### CIS\*1910 Discrete Structures in Computing I W (3-2) [0.50]

An introduction to discrete structures and formal methodologies used in computer science, including Boolean, propositional and predicate logic, finite set theory, functions, relations, and proof techniques.

*Restriction(s):* CIS\*1900

#### CIS\*2030 Structure and Application of Microcomputers F (3-3) [0.50]

This course examines the components of a computer system, including memories, CPU, buses, and input/output subsystems and interface hardware. Programming of these systems is studied, including instruction sets, addressing modes, assembly/machine language programming, development of algorithms for data acquisition, display, and process control.

*Prerequisite(s):* (CIS\*1900 or CIS\*1910), (CIS\*2500 or CIS\*2650)

#### CIS\*2050 Computers and Society S (3-0) [0.50]

Students in this course will investigate and study the social impacts of computing technology. The course will provide a brief introduction to ethics and the history of computing and the Internet. Additional content will focus on areas in which computers and information technology are having an impact on individuals and society including privacy, safety, freedom of speech, intellectual property, work, distribution of wealth, and the environment. This course is intended for students in any discipline. (Offered through Distance Education format only.)

*Restriction(s):* CIS\*3000. This course may not be taken for credit by students in the Software Engineering Major.

#### CIS\*2170 User Interface Design W (3-2) [0.75]

This course is a practical introduction to the area of user interface construction. Topics include user interface components and their application, best practices for user interface design, approaches to prototyping, and techniques for assessing interface suitability.

*Prerequisite(s):* CIS\*1200 or CIS\*1500

#### CIS\*2250 Software Design II W (3-2) [0.50]

This course focuses on the process of software design. Best practices for code development and review will be the examined. The software development process and tools to support this will be studied along with methods for project management. The course has an applied focus and will involve software design and development experiences in teams, a literacy component, and the use of software development tools.

*Prerequisite(s):* CIS\*1250, CIS\*1500

#### CIS\*2430 Object Oriented Programming F (3-2) [0.50]

This course introduces the Object Oriented (OO) approach to programming and algorithm design. Topics will include the creation and use of objects from class libraries, user defined objects, inheritance, modularity, generic code, components, collections and containers, and an introduction to OO design methodologies.

*Prerequisite(s):* CIS\*2500

#### CIS\*2460 Modelling of Computer Systems F (3-2) [0.50]

This course examines discrete simulation based on event queues and random number generation. Methods for generating input data, measuring and evaluating results using standard statistical tests are studied. Topics covered will include model calibration and validation, and algebraic, probabilistic and simple queuing models of software and hardware operation.

*Prerequisite(s):* CIS\*2500

#### CIS\*2500 Intermediate Programming W (3-2) [0.50]

How to interpret a program specification and implement it as reliable code. Experience with pointers, complex data types, and important algorithms. Intermediate tools and techniques in problem-solving, programming and program testing.

*Prerequisite(s):* CIS\*1500

*Equate(s):* CIS\*2650

#### CIS\*2520 Data Structures F (3-2) [0.50]

Basic data structures are studied including: stacks, queues, lists, trees, hashing, search trees, and graphs. Topics include their representation, uses, and algorithms for their traversal and manipulation. The emphasis is on using these structures and assessing the relative effectiveness of alternative implementations.

*Prerequisite(s):* CIS\*2500, (1 of CIS\*1910, ENGG\*1500)

*Equate(s):* CIS\*2420

#### CIS\*2750 Software Systems Development and Integration W (3-2) [0.75]

Techniques and tools used in the development of large software systems. Methods for organizing and constructing modular systems, manipulating files, an introduction to interface design, and use of databases. Software tools for managing projects, database connectivity, configuration management, and system application programmer interfaces.

*Prerequisite(s):* CIS\*2430, CIS\*2520

*Restriction(s):* CIS\*2450

#### CIS\*2910 Discrete Structures in Computing II F (3-2) [0.50]

This course introduces graph theory, combinatorics and other discrete structures used in computer science, including graph representations, traversal and simple graph algorithms, trees, counting strategies, summations, and an introduction to finite probability, recursion, and finite state machine models.

*Prerequisite(s):* CIS\*1500, (CIS\*1910 or ENGG\*1500)

*Restriction(s):* CIS\*1900

#### CIS\*3000 Social Implications of Computing F (4-0) [0.50]

This course focuses on social, ethical, legal and managerial issues in the application of computer science to the information technology industry. Through seminars and case studies, human issues confronting Computer Science professionals will be addressed.

*Prerequisite(s):* 2.00 credits in CIS courses

*Restriction(s):* CIS\*2050 Cannot be taken for credit by students in B.Comp. Software Engineering.

#### CIS\*3090 Parallel Programming F (3-1) [0.50]

This course examines the current techniques for design and development of parallel programs targeted for platforms ranging from multicore computers to high-performance clusters, with and without shared memory. It includes theoretical models for, and hardware effects on, parallel computation, the definitions of speedup, scalability, and data- versus task-parallel approaches. The course will also examine strategies for achieving speedup based on controlling granularity, resource contention, idle time, threading overhead, work allocation, and data localization.

*Prerequisite(s):* (CIS\*2030 or ENGG\*3640), CIS\*3110

**CIS\*3110 Operating Systems W (3-1) [0.50]**

Operating Systems in theory and practice. Components in a system: scheduling and resource allocation; process management, multi-programming, multi-tasking; I/O control and file systems; mechanisms for client-server computing. Examples from contemporary operating systems.

*Prerequisite(s):* (CIS\*2500 or CIS\*2650 ). Recommended (CIS\*2030 or ENGG\*2410).

**CIS\*3120 Digital Systems W (3-2) [0.50]**

This course examines Boolean algebra, minimization of Boolean expressions, design of combinational and sequential logic circuits, memory design, control, ALU, bus design, microprogramming and CPU design.

*Prerequisite(s):* CIS\*2030

**CIS\*3150 Theory of Computation F (3-0) [0.50]**

This course explores the theory of computation including automata theory, Turing machines and their variants, formal languages, parsing, the Halting problem, undecidability, and NP-completeness.

*Prerequisite(s):* ( CIS\*2450 or CIS\*2750), CIS\*3490

*Restriction(s):* CIS\*3620 , CIS\*4600 , CIS\*4620

**CIS\*3190 Software for Legacy Systems W (0-0) [0.50]**

This course is an introduction to legacy software systems used in business, manufacturing, and engineering. Topics include COBOL programming, mainframe systems, and integration of legacy systems with contemporary computing systems. (Offered through Distance Education format only.)

*Prerequisite(s):* CIS\*2500 or work experience in a related field.

**CIS\*3210 Computer Networks F (3-1) [0.50]**

This course covers the high-level (protocol) oriented aspects of computer networks, specifically: application, session, transport and network layers. It includes the internet, socket-level programming, multimedia and quality of service issues. The hardware aspects (switches, LANs, modems, transmission paths) are covered at only a functional level.

*Prerequisite(s):* CIS\*3110

*Restriction(s):* CIS\*4200

**CIS\*3250 Software Design III F (3-3) [0.50]**

This course will examine the historical development of design methodologies and working with legacy systems. It will include an examination of programming paradigms and trends in software design from the past and present. The course has an applied focus and will involve software design and development experiences in teams, a literacy component, and the use of software development tools. (First offering - Fall 2011)

*Prerequisite(s):* CIS\*2250, CIS\*2500

**CIS\*3260 Software Design IV F (3-3) [0.50]**

This course is a study of software architectures and system design methodologies. This will include advanced techniques for project management and experience evaluating software tools. The course has an applied focus and will involve software design and development experiences in teams, a literacy component, and the use of software development tools. (First offering - Fall 2012)

*Prerequisite(s):* CIS\*2430, CIS\*2750, CIS\*3250

**CIS\*3490 The Analysis and Design of Computer Algorithms W (3-2) [0.50]**

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

*Prerequisite(s):* ( CIS\*1900 or CIS\*2910), ( CIS\*2420 or CIS\*2520)

**CIS\*3530 Data Base Systems and Concepts F (3-1) [0.50]**

Review of data organization and data management principles with the perspective of analyzing applications suitable for implementation using a DBMS. Analysis of several data base models, query specification methods, and query processing techniques. Overview of several related issues including concurrency control, security, integrity and recovery. Students are expected to demonstrate concepts through project assignments.

*Prerequisite(s):* ( CIS\*2420 or CIS\*2520), ( CIS\*2450 or CIS\*2750)

**CIS\*3700 Introduction to Intelligent Systems W (3-1) [0.50]**

This course covers the core topics of Artificial Intelligence, namely: agents and environment, search, knowledge representation, reasoning, and learning. The last three topics are covered using logic as the common formalism for coherence. The course introduces a broad range of basic concepts, terminology, and applications, in addition to providing some specific, widely applicable methodologies.

*Prerequisite(s):* (CIS\*3750 or CIS\*3760), (CIS\*2460 or STAT\*2040)

*Restriction(s):* CIS\*4750 , CIS\*4760

**CIS\*3750 System Analysis and Design in Applications F (3-2) [0.75]**

An introduction to the issues and techniques encountered in the design and construction of software systems. The theory and models of software evolution. Topics include requirements and specifications, prototyping, design principles, object-oriented analysis and design, standards, integration, risk analysis, testing and debugging.

*Prerequisite(s):* CIS\*2750

*Restriction(s):* CIS\*3430

**CIS\*3760 Software Engineering W (3-2) [0.75]**

This course is an examination of the software engineering process, the production of reliable systems and techniques for the design and development of complex software. Topics include object-oriented analysis, design and modeling, software architectures, software reviews, software quality, software engineering, ethics, maintenance and formal specifications.

*Prerequisite(s):* CIS\*2750, (CIS\*3110 recommended )

*Restriction(s):* CIS\*3200

**CIS\*4000 Applications of Computing Seminar F,W (0-6) [0.50]**

This capstone course provides students an opportunity to combine their area of application with their studies in computing via a course project and seminar series. Application areas discussed in any particular semester will depend on areas of application selected by students. Students are required to present their work in a seminar and also to participate in the critical analysis and review of the work of other students taking this course.

*Prerequisite(s):* Registration in semester 7 or higher of the B. Comp. Major in Computer Science and completion of a minimum of 2.50 credits in an Area of Application.

**CIS\*4050 Advanced Computer Architectures F (3-1) [0.50]**

Central processor architectures, control and microprogramming, memory systems, special architectures, underlying support for special architectures, architectures suitable for very large scale integration. (Offered in even-numbered years and may be offered in odd-numbered years.)

*Prerequisite(s):* CIS\*2030, CIS\*3110, CIS\*3120

**CIS\*4110 Computer Security W (3-1) [0.50]**

This course is a practical survey of the principles and practice of information security. Topics include but are not limited to encryption (symmetric and public key cryptography, key exchange, authentication), security issues and threats (eavesdropping, impersonation, denial of service, viruses, worms, access violations, PKI), system and network security, intrusion detection, access control (DAC, MAC, RBAC), database security, the common criteria, and threat risk management.

*Prerequisite(s):* CIS\*3110

**CIS\*4150 Software Reliability and Testing F (2-2) [0.50]**

This course serves as an introduction to systematic methods of testing and verification, covering a range of static and dynamic techniques and their use within the software development process. Concepts such as defining necessary reliability, developing operational profiles, techniques to improve and predict software reliability, preparing and executing tests, black box testing, white box testing, unit testing, system testing, and integration testing will be explained.

*Prerequisite(s):* CIS\*3750 or CIS\*3760

**CIS\*4210 Telecommunications W (3-1) [0.50]**

This course covers the low-level and the hardware-oriented aspects of computer communications, specifically the physical, link, and network layers. It includes basic telecommunication technology, local area networks, low level protocols, switching technologies, wireless and mobile networking, data and stream compression, and error coding. (Offered in odd-numbered years.)

*Prerequisite(s):* CIS\*3750 or CIS\*3760

*Restriction(s):* CIS\*4200

**CIS\*4250 Software Design V F (0-6) [0.50]**

This is a capstone course which applies the knowledge gained from the previous Software Design courses to a large team project. The course has an applied focus and will involve software design and development experiences in teams, a literacy component, and the use of software development tools. (First offering - Fall 2013)

*Prerequisite(s):* CIS\*2750, CIS\*3260, CIS\*3750

**CIS\*4300 Human Computer Interaction F (2-2) [0.50]**

This course examines the methods for user interface software design, including interface representations and testing. Topics which will be studied include the evaluation and design of sample application systems, impacts of computer-based information systems on individuals and organizations, implementation and testing tools, and planning of learning stages and design of assistance subsystems.

*Prerequisite(s):* CIS\*3110, (CIS\*3750 or CIS\*3760)

**CIS\*4410 Trends in Distributed Systems W (3-1) [0.50]**

This course examines the technical issues surrounding modern and future distributed commercial enterprises. Special attention is given to new communication modes, high volume, data-intensive systems, distributed transactions and security mechanisms.

*Prerequisite(s):* CIS\*3210, (CIS\*3750 or CIS\*3760)

**CIS\*4430 Information Organization and Retrieval W (3-1) [0.50]**

This course studies advanced techniques for information management. This includes the analysis of advanced indexing structures, information retrieval, feedback strategies, text searchings, automatic indexing, database query optimization and system support, web based retrieval. (Offered in even-numbered years and may be offered in odd-numbered years.)

*Prerequisite(s):* CIS\*3110, CIS\*3530, (CIS\*3750 or CIS\*3760)

**CIS\*4450 Special Topics in Information Science U (3-1) [0.50]**

A variety of advanced topics mainly from areas within general information processing. Subject areas discussed in any particular semester will depend on the interests of the students and the instructor. Students should check with the Department of Computing and Information Science to determine what topic will be offered during specific semesters and which prerequisites, if any, are appropriate.

*Restriction(s):* Instructors consent required.

**CIS\*4500 Special Topics in Computing Science U (3-1) [0.50]**

A variety of advanced topics within Computing Science. Subject areas discussed in any particular semester will depend upon the interests of both the students and the instructor. Students should check with the Department of Computing and Information Science to determine what topic will be offered during specific semesters and which prerequisites, if any, are appropriate.

*Restriction(s):* Instructor consent required.

**CIS\*4650 Compilers W (3-1) [0.50]**

This course is a detailed study of the compilation process. Topics include interpreters, overall design implementation of a compiler, techniques for parsing, building and manipulating intermediate representations of a program, implementation of important features, code generation and optimization.

*Prerequisite(s):* CIS\*2030, CIS\*3110, CIS\*3150

*Restriction(s):* CIS\*3650

**CIS\*4720 Image Processing and Vision W (3-1) [0.50]**

This course is an introduction to the process of image processing. Emphasis is placed on topics such as image enhancement, segmentation morphological analysis, texture analysis, visualization and image transformations. Applications of image processing in medicine, forensics, food and security are surveyed. (Offered in odd-numbered years.)

*Prerequisite(s):* (CIS\*2450 or CIS\*2750), CIS\*3110, (CIS\*2460 or STAT\*2040), (CIS\*3700 recommended)

*Restriction(s):* CIS\*4760

**CIS\*4780 Computational Intelligence F (3-1) [0.50]**

This course introduces concepts of soft computing: modelling uncertainty, granular computing, neurocomputing, evolutionary computing, probabilistic computing and soft computing for software engineering. (Offered in odd-numbered years.)

*Prerequisite(s):* (CIS\*3750 or CIS\*3760) CIS\*3490, (CIS\*2460 or STAT\*2040), (CIS\*3700 recommended)

*Restriction(s):* CIS\*4750

**CIS\*4800 Computer Graphics W (3-1) [0.50]**

This course is an introduction to computer graphics. Topics include graphics programming concepts, geometrical transformations, viewing 3-D projections, raster graphics, sculptured surfaces, visible surface determination, image processing and other special topics. Practical issues will be covered by assignment using currently available graphics equipment. (Offered in even-numbered years.)

*Prerequisite(s):* CIS\*3110, (CIS\*3750 or CIS\*3760)

**CIS\*4820 Game Programming W (3-1) [0.50]**

This course will focus on the components found in modern 3-D game engines. It will emphasize the algorithms and data structures required to create real-time computer graphics, sound and network communications. (Offered in odd-numbered years.)

*Prerequisite(s):* CIS\*3110, (CIS\*3430 or CIS\*3750)

**CIS\*4900 Computer Science Project S,F,W (0-6) [0.50]**

Planning, developing and writing a research proposal under individual faculty supervision. The course, in continuation with CIS\*4910 provides senior undergraduates an opportunity to pursue an independent course of study. The topic selected will be determined by agreement between the student and the faculty member with expertise in the area.

*Prerequisite(s):* 7.00 credits in CIS

*Restriction(s):* Instructor consent required.

**CIS\*4910 Computer Science Thesis S,F,W (0-6) [0.50]**

This course is a continuation of CIS\*4900. The student will conduct and write an undergraduate thesis under the individual supervision of a faculty member. In addition the student is required to present his/her work in a seminar and also participate in the critical analysis and review of the work of other students taking this course.

*Prerequisite(s):* CIS\*4900

*Restriction(s):* Instructor consent required.

## Co-operative Education

### *Co-operative Education & Career Services*

*COOP\*XXXX courses are limited to students registered in a co-operative education program.*

#### **COOP\*1000 Co-op Work Term I F,W,S (3-0) [0.00]**

This is a semester long experience in a paid work setting. Co-op work semesters differ depending on the program and major. Location of the semester is varied. Refer to program of study for the semester in which this is scheduled. Students must obtain a passing grade in order to continue in the Co-op Program.

*Prerequisite(s):* COOP\*1100

#### **COOP\*1100 Introduction to Co-operative Education F,W (1-0) [0.00]**

This course will introduce students to the theory and practice of co-operative education at the University of Guelph. Students will learn to take full advantage of the co-op option. They will acquire practice in the skills required to succeed in the competitive process of securing suitable work terms. Specifically, the course will cover: characteristics and expectations of the "new" world of work, interview skills, resume and cover letter writing, as well as general skills required to be successful in the co-op program. Students also obtain practice in the co-op employment process.

*Prerequisite(s):* 2.00 credits

*Restriction(s):* Enrolment in a co-operative education program

#### **COOP\*2000 Co-op Work Term II F,W,S (3-0) [0.00]**

This is a semester long experience in a paid work setting. Co-op work semesters differ depending on the program and major. Location of the semester is varied. Refer to program of study for the semester in which this is scheduled. Students must obtain a passing grade in order to continue in the Co-op Program.

*Prerequisite(s):* Completion of previous co-op work requirements in COOP\*1000

#### **COOP\*3000 Co-op Work Term III F,W,S (3-0) [0.00]**

This is a semester long experience in a work setting. Co-op work semesters differ depending on the program and major. Location of the semester is varied. Refer to program of study for the semester in which this is scheduled. Students must obtain a passing grade in order to continue in the Co-op Program.

*Prerequisite(s):* Completion of previous co-op work requirements in COOP\*2000

#### **COOP\*4000 Co-op Work Term IV F,W,S (3-0) [0.00]**

This is a semester long experience in a work setting. Co-op work semesters differ depending on the program and major. Location of the semester is varied. Refer to program of study for the semester in which this is scheduled. Students must obtain a passing grade in order to continue in the Co-op Program.

*Prerequisite(s):* Completion of previous co-op work requirements in COOP\*3000

#### **COOP\*5000 Co-op Work Term V F,W,S (3-0) [0.00]**

This is a semester long experience in a work setting. Co-op work semester differ depending on the program and the major. Location of the semester is varied. Refer to program of study for the semester in which this is scheduled. Students must obtain a passing grade in order to continue in the Co-op program.

*Prerequisite(s):* Completion of previous co-op work requirements in COOP\*4000

## Crop Science

Department of Plant Agriculture

### **CROP\*1050 Green Energy - Fuel from Plants W (3-0) [0.50]**

This course is a science-based examination of the potential for fuels derived from crops to contribute to sustainability of the energy supply, conservation of non-renewable resources and the mitigation of global climate change. This course covers fundamental principles underlying crop productivity and the conversion of plant biomass to various biofuels. This course applies scientific principles and quantitative analyses to evaluate the potential economic and environmental benefits of adoption of these alternative fuel sources. (Offered through Distance Education format only.)

*Restriction(s):* Not acceptable for students in the B.Sc., B.Sc.(AGR) or B.Sc.(ENV) programs.

### **CROP\*2110 Crop Ecology W (3-0) [0.50]**

Fundamental ecological principles are applied to managed agricultural ecosystems. Crop selection and management are viewed as influencing interactions among species and the environment. Adaptation and distribution of temperate zone crops are related to both environmental constraints and human intervention.

*Prerequisite(s):* BIOL\*1040 or BIOL\*1070

### **CROP\*2280 Crops in Land Reclamation F (2-2) [0.50]**

The use of vegetation to reclaim land disturbed by human intervention, including mining and extraction, construction of right-of-ways, waste disposal, and logging, are introduced. Fundamentals of soil, plant, and associated microbial relations are reviewed, with emphasis on plant adaptation to soil constraints. Presentations by guest speakers and visits to nearby sites are used to identify the off as well as on-site environmental implications of land disturbance.

### **CROP\*3300 Grain Crops W (3-0) [0.50]**

Management strategies and world production of the major temperate grain crops are studied relative to their botanical and physiological characteristics and to available environmental resources. The utilization of grain crops for human food, livestock feed, and various industrial products are examined. (Offered in odd-numbered years.)

*Prerequisite(s):* 1 of AGR\*2451/2 , AGR\*2470, CROP\*2110

### **CROP\*3310 Protein and Oilseed Crops F (3-0) [0.50]**

Management strategies and world production of the major temperate protein and oilseed crops are studied relative to their botanical and physiological characteristics and to available environmental resources. The utilization of protein and oilseed crops for human food, livestock feed and various industrial products are examined. (Offered in odd-numbered years.)

*Prerequisite(s):* 1 of AGR\*2451/2 , AGR\*2470, CROP\*2110

### **CROP\*3340 Managed Grasslands W (3-2) [0.50]**

Managed forage grasses and legumes provide grazing, conserved feed, and a wider range of services to the environment and society at large. Agro-ecological, genetic, and managerial considerations will be integrated toward addressing questions of ruminant production and environmental management. Species will be distinguished morphologically and physiologically, focusing on adaptation to climatic, edaphic, and managerial constraints. Topics will include: physiological attributes of forage species, sward lifespan, establishment and maintenance practices, forage quality indices and harvest management. (Offered in even-numbered years.)

*Prerequisite(s):* 1 of AGR\*2451/2 , AGR\*2470, CROP\*2110

### **CROP\*4220 Cropping Systems W (3-2) [0.50]**

Design of cropping systems for specific livestock, poultry and cash crop enterprises; integration of all factors affecting crop yields, quality and economy of production such as choice and interchangeability of crops, crop sequence, tillage, pest control, seasonal work programming, harvesting, drying and storage.

*Prerequisite(s):* (2 of CROP\*3300, CROP\*3310, CROP\*3320 , CROP\*3330 ), (SOIL\*3080 or SOIL\*4090)

### **CROP\*4240 Weed Science F (3-3) [0.50]**

Weeds will be studied in relation to agricultural practices. Principles of chemical, mechanical and biological control will be outlined. Laboratories will include weed identification, weed control methods, and demonstrations of the effects of various herbicides.

*Prerequisite(s):* AGR\*2451/2 or AGR\*2470

### **CROP\*4260 Crop Science Field Trip F (0-4) [0.50]**

This field study course is designed to increase the student's knowledge of agricultural production, agricultural policy and agri-business. Students will tour the midwestern United States just prior to the start of the fall semester, visiting cash crop, horticultural and livestock farms, and supporting industries such as processing, manufacturing, elevators and stockyards. A student fee will be assessed to cover transportation and lodging.

*Prerequisite(s):* 12.50 credits including AGR\*2470

*Restriction(s):* A cumulative average of 65% and instructor consent required.

## Economics

*Department of Economics and Finance*

*For courses without semester designations, please check with the department. Advance schedules are available in the department.*

### **ECON\*1050 Introductory Microeconomics S,F,W (3-0) [0.50]**

An introduction to the Canadian economy: price determination, market structure and resource allocation; the behaviour of consumers and firms; market intervention by government. Some of the economic issues addressed may include agricultural price supports, rent control, the NAFTA, environmental regulation, price discrimination, pay equity, and taxation. (Also offered through Distance Education format.)

*Equate(s):* ECON\*1200

### **ECON\*1100 Introductory Macroeconomics S,F,W (3-0) [0.50]**

The Canadian economy: aggregate performance and policy; an analysis of the determinants of national income, employment and the price level, the role of government monetary and fiscal policies in improving the rate of economic growth. (Also offered through Distance Education format.)

*Prerequisite(s):* ECON\*1050

### **ECON\*2000 Economic Problems in Canada U (3-0) [0.50]**

This course is a study of important socio-economic issues in Canada using the basic principles of macro and microeconomics. Topics may include population, poverty, foreign ownership, regional development, etc.

*Prerequisite(s):* ECON\*1050, ECON\*1100

### **ECON\*2100 Economic Growth and Environmental Quality F (3-0) [0.50]**

An examination of the implications of economic growth on the quality of the environment, employing the basic principles of economic analysis. (Also offered through Distance Education format.)

*Prerequisite(s):* ECON\*1050

### **ECON\*2200 Industrial Relations F (3-0) [0.50]**

This is a survey course of the Canadian industrial relations system. Among the topics covered are: the growth and objectives of unions, the legal framework of collective bargaining, the effects of unions on industry and the economy, industrial conflict and public policies.

*Prerequisite(s):* ECON\*1050

### **ECON\*2310 Intermediate Microeconomics S,F,W (3-1) [0.50]**

This course is an analysis of the behaviour of households and firms under alternative assumptions and market conditions. (Also offered through Distance Education format.)

*Prerequisite(s):* ECON\*1050, ECON\*1100, (1 of MATH\*1000, MATH\*1030, MATH\*1080, MATH\*1200)

### **ECON\*2410 Intermediate Macroeconomics S,F,W (3-1) [0.50]**

This course is an analysis of closed economy models of aggregate spending, output, employment, prices and interest rates under alternative assumptions about the nature of labour, product and financial markets. The analysis of theories of consumption, investment and money demand. (Also offered through Distance Education format.)

*Prerequisite(s):* ECON\*1100, (1 of MATH\*1000, MATH\*1030, MATH\*1080, MATH\*1200)

### **ECON\*2420 Canadian Economic History U (3-0) [0.50]**

This course surveys the development of the Canadian economy from the aboriginal economy to the early fur and fish trades, agricultural settlement, industrialization, the Great Depression, growth of the public sector and fast economic growth after World War Two. Particular attention is paid to international economic relations and to regional differences within Canada.

*Prerequisite(s):* ECON\*1050, (ECON\*1100 or HIST\*2450)

### **ECON\*2560 Theory of Finance F,W (3-0) [0.50]**

This course looks at capital budgeting and long-term finance and investment decisions by firms and individuals. It introduces capital asset pricing under uncertainty and the concept of efficient markets. A major emphasis is on corporate finance. (Also offered through Distance Education format.)

*Prerequisite(s):* ECON\*1100, (1 of ECON\*2310, MATH\*1000, MATH\*1030, MATH\*1080, MATH\*1200), (1 of ECON\*2740, PSYC\*2010, STAT\*2040, STAT\*2050, STAT\*2060, STAT\*2080, STAT\*2090, STAT\*2100, STAT\*2120)

*Restriction(s):* ECON\*3460, ECON\*3560

### **ECON\*2650 Introductory Development Economics F (3-0) [0.50]**

This course introduces students to the economic experience of developing countries, the ways in which economists try to understand it, and the implications for policy. The basic tools of economic analysis as taught in the introductory courses are used to analyse topics that may include theories of growth, trade, education, foreign investment, exchange rates, labour markets, the role of government, environmental sustainability and strategies related to agriculture, population, industry and investment.

*Prerequisite(s):* ECON\*1050, ECON\*1100

### **ECON\*2720 Business History F (3-0) [0.50]**

This course surveys the evolution of economic activity and organization from the industrial revolution to the present. Particular attention is given to the changing relationship between technology and business organization, the shift from proprietorship to corporation and the rise of multinational enterprise. Other topics may include the relationship between business and government, the role of the entrepreneur in the process of technical change and the evolution of work patterns and standards of living.

*Prerequisite(s):* ECON\*1050, (ECON\*1100 or any 1.50 credits in history)

### **ECON\*2740 Economic Statistics F,W (3-1) [0.50]**

This course is designed to prepare students conceptually and mathematically for ECON\*2560, Theory of Finance and ECON\*3740, Introduction to Econometrics. Topics include the summation operator, descriptive statistics, frequency distributions, probability and statistical independence, the binomial distribution, algebra of the expectation operator, discrete bivariate distributions, covariance, variance of a linear function of random variables, the normal and t distributions, sampling distributions, point and interval estimation, hypothesis testing and an introduction to ordinary least squares. Additional topics may be included at the instructor's discretion. Examples and assignment questions are drawn from economics and finance.

*Prerequisite(s):* ECON\*1050, ECON\*1100, (1 of MATH\*1000, MATH\*1030, MATH\*1050, MATH\*1080, MATH\*1200)

### **ECON\*2770 Introductory Mathematical Economics F,W (3-1) [0.50]**

This course applies the elements of calculus and matrix algebra to simple microeconomic and macroeconomic problems.

*Prerequisite(s):* ECON\*1050, ECON\*1100, (1 of MATH\*1000, MATH\*1030, MATH\*1080, MATH\*1200)

### **ECON\*3100 Game Theory W (3-1) [0.50]**

The course introduces students to non-cooperative game theory, which is an important method of analysis for economics situations involving small numbers of interacting economic agents. The course is centered on the concept of Nash equilibrium, and applies this equilibrium concept to static and dynamic games with full as well as incomplete information. The purpose of the course is to enable students to take any economic situation, find an economic model (game) that depicts the incentives facing the participants, and analyze the game to predict the behaviour of the economic agents.

*Prerequisite(s):* ECON\*2310, ECON\*2410, (ECON\*2770 or MATH\*1210)

*Restriction(s):* ECON\*3770

### **ECON\*3300 Economics of Health and the Workplace U (3-0) [0.50]**

This course will introduce students to concepts of health economics with particular relevance to workplace issues. Topics to be covered include the determinants of health, the demand for and supply of health care, the market for health care providers, health insurance, public and private, the role of health insurance in the labour market, whether not having to provide comprehensive health insurance to their workers gives Canadian firms an edge over their American competitors, workplace health risks and their effects on working conditions and salaries, workplace wellness programs and their evaluation, and the analysis of the cost effectiveness of health interventions.

*Prerequisite(s):* ECON\*2310, (1 of ECON\*2740, PSYC\*2010, STAT\*2040, STAT\*2050, STAT\*2060, STAT\*2080, STAT\*2090, STAT\*2100, STAT\*2120)

### **ECON\*3460 Introduction to Finance F (3-0) [0.50]**

This course examines some important principles of the theory of finance which underlie investment (capital budgeting) and associated financing decisions of financial managers. These decisions are necessarily interdependent and typically carried out under conditions of uncertainty regarding the future values of key economic variables, for example, cash flows. Problems, illustrations and short case studies are used to demonstrate how finance theory can be applied and assist financial managers to make optimal decisions. (Not open to B.Comm. MEIF or MEIF:C students.) (Last Offering - Fall 2013)

*Prerequisite(s):* ECON\*1050, ECON\*1100, (1 of ECON\*2740, PSYC\*2010, STAT\*2060, STAT\*2080)

*Restriction(s):* For B.Comm. students only. But, B.Comm.(MEIF) not allowed to take this course.

**ECON\*3500 Urban Economics U (3-0) [0.50]**

This course is designed to apply the basic principles of intermediate economic theory to problems facing urban areas with emphasis on Canada. Topics to be covered will include such things as housing, urban poverty, municipal financing, transportation.

*Prerequisite(s):* ECON\*2310

**ECON\*3520 Labour Economics U (3-0) [0.50]**

A study of the labour market, wage determination and the relationship between wages, employment, and prices.

*Prerequisite(s):* ECON\*2310, (1 of ECON\*2740, PSYC\*2010, STAT\*2040, STAT\*2050, STAT\*2060, STAT\*2080, STAT\*2090, STAT\*2100, STAT\*2120)

**ECON\*3530 Industrial Organization U (3-0) [0.50]**

This course examines industries in which firms have the potential to exercise market power. Topics include how the competitive environment affects the behaviour of firms, measuring the extent of market power on welfare. The performance of markets under monopolies, dominant firms, cartels and oligopolies is examined and related aspects of Canadian competition policy and regulations are discussed.

*Prerequisite(s):* ECON\*2310, (ECON\*2770 or MATH\*1210)

**ECON\*3560 Theory of Finance F,W (3-0) [0.50]**

Capital budgeting and long-term finance and investment decisions by firms and individuals. Introduction to capital asset pricing under uncertainty and to concept of efficient markets. Major emphasis is on corporate finance. (Also offered through Distance Education format.) (Last offering - Summer 2011)

*Prerequisite(s):* ECON\*2310, (1 of ECON\*2740, PSYC\*2010, STAT\*2040, STAT\*2050, STAT\*2060, STAT\*2080, STAT\*2090, STAT\*2100, STAT\*2120)

**ECON\*3580 Economics of Regulation U (3-0) [0.50]**

A study of the economic reasons for government intervention in the marketplace. Emphasis will be placed on the role of crown corporations, regulatory agencies, regulation rules and public sector price-setting in the Canadian economy.

*Prerequisite(s):* ECON\*2310

**ECON\*3610 Public Economics U (3-0) [0.50]**

This course examines the interventionist role of government in the economy. It examines several sources of market failure which are used to justify government intervention. These include public goods, externalities and redistribution. The course also evaluates alternative sources of government revenue from the perspectives of both equity and efficiency. These include the personal and corporate income taxes, sales taxes and wealth taxes.

*Prerequisite(s):* ECON\*2310

**ECON\*3620 International Trade U (3-0) [0.50]**

An introduction to the general equilibrium analysis of international trade, international factor movements and commercial policy. Special emphasis is given to Canada's international trade relationships.

*Prerequisite(s):* ECON\*2310

**ECON\*3660 Economics of Equity Markets U (3-0) [0.50]**

This course studies the economic literature regarding the determination of security prices and the operation of the stock market. (Also offered through Distance Education format.)

*Prerequisite(s):* ECON\*2310, (ECON\*2560 or ECON\*3560)

**ECON\*3710 Advanced Microeconomics F,W (3-1) [0.50]**

This course provides an in-depth treatment of consumer and producer theory leading to the general equilibrium model of the economy and the study of welfare economics.

*Prerequisite(s):* ECON\*2310, (ECON\*2770 or MATH\*1210). A grade average of 70% or more in these courses is recommended.

**ECON\*3720 History of the World Economy Since 1850 U (3-0) [0.50]**

The focus of the course is the study of the evolution of the world economy since 1850. Topics may include the costs and benefits of empire to Britain, Anglo-German trade rivalry, the rise to prominence of "settler colonies", economic growth in the Third World, reparations and war debt, agricultural overproduction, origins of the Great Depression, the 1945-1973 boom in world production and trade.

*Prerequisite(s):* ECON\*1050, ECON\*1100, (1 of ECON\*2310, EURO\*1050, HIST\*2450, HUMN\*2070, IDEV\*2010, IDEV\*2500)

**ECON\*3730 Europe and the World Economy to 1914 U (3-0) [0.50]**

This course surveys the world economy with a particular focus on the industrial revolution in Europe, demographic change, the rise to prominence of the 'settler colonies', the origins of international inequality and the experience of globalization during the later nineteenth century. Particular attention is given to international trade, capital flows and migration.

*Prerequisite(s):* ECON\*1050, ECON\*1100, (1 of ECON\*2310, EURO\*1050, EURO\*2070, HIST\*2450, HUMN\*2070, IDEV\*2010, IDEV\*2500)

**ECON\*3740 Introduction to Econometrics F,W (3-1) [0.50]**

This computer-based course involves the specification and estimation of economic models and the testing of economic hypotheses using appropriate test statistics. Topics include the summation operator, expectation operator, ordinary least squares estimation, dummy variables, seasonality, multicollinearity, heteroskedasticity, autocorrelation, data sources (including uses of the Data Resource Centre). Additional topics may be included at the instructor's discretion. Heavy emphasis will be placed on applications and writing up results. Some use of spreadsheet software (e.g. QuattroPro, Excel) and statistical software (e.g. TSP, SHAZAM) will be required.

*Prerequisite(s):* ECON\*2310, ECON\*2410, (1 of ECON\*2740, STAT\*2040, STAT\*2060, STAT\*2080), (ECON\*2770 or MATH\*1210)

**ECON\*3760 Fundamentals of Derivatives W (3-0) [0.50]**

This course covers the fundamentals of derivatives with emphasis on theory and empirical applications in the context of corporate price risk management. Issues of corporate governance and business ethics as they relate to price risk management will be considered.

*Prerequisite(s):* ECON\*2310, (1 of ECON\*2560, ECON\*3460, ECON\*3560)

*Restriction(s):* AGECE\*4240, FARE\*4240

**ECON\*3810 Advanced Macroeconomics W (3-0) [0.50]**

This course provides an advanced study of a wide range of issues in intertemporal macroeconomics. When constructing macroeconomic models in this course we will explicitly take into account microeconomic foundations. The models constructed will be used to study short-run fluctuations (or business cycles) and long term growth, and to explain cross country income disparities. Topics also include open economy macroeconomic issues.

*Prerequisite(s):* ECON\*2410, (ECON\*2740 or STAT\*2040), (ECON\*2770 or MATH\*1210)

*Equate(s):* ECON\*3600

**ECON\*3860 International Finance F (3-0) [0.50]**

This course focuses on international macroeconomic issues: the balance of payments; models of exchange rate determination; foreign exchange risk and covered interest arbitrage; alternative exchange rate regimes; small versus large economies; monetary and fiscal policy in an open economy. (First offering - Fall 2012)

*Prerequisite(s):* ECON\*2410, (ECON\*2560 or ECON\*3560)

*Equate(s):* ECON\*3600

**ECON\*3960 Money, Credit and the Financial System U (3-0) [0.50]**

This course explores the economics of banking, other financial institutions and credit markets.

*Prerequisite(s):* ECON\*2410, (ECON\*2560 or ECON\*3560)

*Equate(s):* ECON\*3510

**ECON\*4400 Economics of Organizations and Corporate Governance U (3-0) [0.50]**

This course introduces students to the latest developments in the economic analysis of the inside workings of firms. The course is centered on the concept of organizational structure, which is made up of three variables: allocation of decision rights, performance evaluation and performance incentives. 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. (Offered through Distance Education only.)

*Prerequisite(s):* ECON\*2310 Students must have completed a minimum of 12 credits.

**ECON\*4500 Topics in Urban Economics U (3-0) [0.50]**

This course will investigate selected theoretical and applied topics in urban economics in depth. Among topics which might be treated are location theory, the theory of spatial structure, transportation economics, the economics of housing, the economics of land use regulation, urban public finance.

*Prerequisite(s):* ECON\*3740, (ECON\*3710 or ECON\*3500)

**ECON\*4560 Advanced Topics in Finance U (3-0) [0.50]**

This course will examine selected advanced topics in finance, such as optimal capital structure under asymmetric information; theoretical and empirical analysis of mergers and acquisitions; asset pricing theory; pricing derivative securities; and financial econometrics.

*Prerequisite(s):* (ECON\*2560 or ECON\*3560), ECON\*3710, (1 of ECON\*3100, ECON\*3770, ECON\*3810, ECON\*4700), ECON\*3740, (2 of ECON\*3510, ECON\*3660, ECON\*3760, FARE\*4240, ECON\*3860, ECON\*3960)

**ECON\*4640 Applied Econometrics I F (3-0) [0.50]**

This course discusses the classical linear regression model and its extensions including generalized least squares and the theory and application of F tests. The maximum likelihood principle is introduced, as are alternative approaches to testing, e.g. LM, LR and Wald tests. Additional topics may be included at the instructor's discretion. Matrix algebra is used and proof of the Gauss-Markov theorem is included, but discussion of proofs is in general limited in order to allow substantial applications to data using statistical software such as TSP, SHAZAM, SAS, STATA.

*Prerequisite(s):* ECON\*3740

*Equate(s):* ECON\*4740

**ECON\*4660 Financial Markets Risk Management U (3-0) [0.50]**

This course covers the advanced theory and applications of financial derivatives (for underlying assets such as equity and debt instruments, and exchange rate instruments) as it relates to the financial strategy of the firm. Specific emphasis will be devoted to the development of a comprehensive and coherent set of risk management policies and controls.

*Prerequisite(s):* 1 of AGE\*4240, ECON\*3510, ECON\*3760, ECON\*3960, FARE\*4240

**ECON\*4700 Advanced Mathematical Economics F (3-1) [0.50]**

This course provides students with the necessary mathematical skills required to build rigorous models in economics, including differential and integral calculus, optimization and comparative statics analysis and advanced topics in linear algebra. It continues in the second half with application to modelling in a particular area of economics. The specific area will vary from year to year, and can include such topics as general equilibrium modelling, mathematical Finance models, or economics of the environment.

*Prerequisite(s):* (ECON\*3600 or ECON\*3810), ECON\*3710, ECON\*3740

**ECON\*4710 Advanced Topics in Microeconomics F (3-0) [0.50]**

An intensive study of the scope, methodology, and content of contemporary microeconomics; selected topics in partial and general equilibrium analysis.

*Prerequisite(s):* ECON\*3710

**ECON\*4720 Topics in Economic History U (3-0) [0.50]**

This course uses economic theory to analyse the process of historical economic change.

*Prerequisite(s):* 12.50 credits including (1 of ECON\*2310, ECON\*2720, ECON\*3720, ECON\*3730)

**ECON\*4750 Topics in Public Economics U (3-0) [0.50]**

This course examines selected topics related to the expenditure and taxation functions of government. Topics may include issues in public good theory such as the free rider problem, the problem of eliciting truthful revelation of preferences and the use of taxes as a corrective device for externalities. The course may also address optimal taxation as well as tax evasion. Throughout this course the trade-off between efficiency and equity is emphasized.

*Prerequisite(s):* ECON\*3710

**ECON\*4760 Topics in Monetary Economics U (3-0) [0.50]**

Selected topics in monetary economics such as theories of the demand for and supply of money, the nature and role of private banks and central banks, the transmission processes of monetary policy are examined.

*Prerequisite(s):* (ECON\*3600 or ECON\*3810), ECON\*3740, (1 of ECON\*3510, ECON\*3710, ECON\*3960)

**ECON\*4780 Topics in Industrial Organization U (3-0) [0.50]**

Selected topics in the theoretical and empirical study of the organization and performance of firms and markets are covered in this course. Topics may include: strategic behaviour of firms such as actions to deter entry of rivals, pre-emptive choice of location and product quality, and research and development; the regulation of firms under uncertainty; econometric analysis of the use of market power; and modern advances in the theory of the firm.

*Prerequisite(s):* ECON\*3530, ECON\*3740

**ECON\*4790 Topics in Labour Market Theory U (3-0) [0.50]**

Selected topics in advanced labour market theory with emphasis on empirical evidence for the Canadian labour market are covered in this course.

*Prerequisite(s):* ECON\*3740, (ECON\*3710 or ECON\*3520)

**ECON\*4800 Competitiveness and Strategic Advantage U (3-0) [0.50]**

This course is about the creation and maintenance of long-term vision for the corporation from the perspective of the general manager. It is concerned with both the determination of strategic direction and the management of the strategic process.

*Prerequisite(s):* 14.50 credits including (AGE\*3320 or BUS\*3320), ECON\*2310, (ECON\*2560 or ECON\*3560)

**ECON\*4810 Advanced Topics in Macroeconomics W (3-0) [0.50]**

This course explores the theory of complex aggregate economic models; their assumptions, construction, and use in the analysis of macroeconomic activity.

*Prerequisite(s):* (ECON\*3600 or ECON\*3810), ECON\*3710, ECON\*3740

**ECON\*4830 Economic Development U (3-0) [0.50]**

A study of the theories, problems and policies of economic growth with special reference to underdeveloped countries.

*Prerequisite(s):* ECON\*2310

**ECON\*4840 Applied Econometrics II W (3-0) [0.50]**

This is a continuation of ECON\*4640 and deals with asymptotic theory, maximum likelihood estimation, instrumental variables, simultaneous equation models and selected topics such as models for limited dependent variables, models for panel data, ARCH models, units roots and error correction models. There will be applications to data using statistical software.

*Prerequisite(s):* ECON\*4640

**ECON\*4860 Seminar in Current Economic Problems U (3-0) [0.50]**

In a seminar setting, selected contemporary economic problems are examined.

*Prerequisite(s):* (ECON\*3600 or ECON\*3810), ECON\*3710, ECON\*3740

**ECON\*4880 Topics in International Economics U (3-0) [0.50]**

Selected topics involving the advanced analysis of the causes and effects of trade and financial flows and international factor movements are covered in this course.

*Prerequisite(s):* (ECON\*3600 or ECON\*3810), (ECON\*3710 or ECON\*3620)

**ECON\*4890 History of Economic Thought U (3-0) [0.50]**

A study of the development of economic theory, the tools of economic analysis, and the evaluation of economics as a science, together with an analysis of the circumstances affecting this development.

*Prerequisite(s):* ECON\*2310, ECON\*2410

**ECON\*4900 Special Study in Economics S,F,W (3-0) [0.50]**

The special study option is designed to provide senior undergraduate students with an opportunity to pursue an independent course of study. The subject matter will be related to regular 4000 level courses. Students will be required to submit a major paper/report on the subject matter studied. Formal agreement between the student and instructor of the course is required as well as the approval of the department chair or designate.

*Prerequisite(s):* (ECON\*3600 or ECON\*3810), ECON\*3710, ECON\*3740

**ECON\*4910 Special Study in Economics S,F,W (3-0) [0.50]**

Same description as for ECON\*4900.

**ECON\*4930 Environmental Economics U (3-0) [0.50]**

This course is an advanced treatment of the interrelationship between economic activities and the state of the natural environment from an economics perspective.

*Prerequisite(s):* 14.50 credits including ECON\*2310, ECON\*2410, ECON\*2770



## Environmental Design and Rural Development

*School of Environmental Design and Rural Development*

### EDRD\*1400 Introduction to Design W (3-0) [0.50]

This course is designed to increase visual awareness and recognition of natural and planned design elements in the environment. Students will investigate the roles of designers and seek to develop an understanding of design as an applied process that responds to human needs.

*Equate(s):* MCS\*1400

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

### EDRD\*2020 Interpersonal Communication F (3-0) [0.50]

This course introduces to dyadic and small-group communication. The focus is on communication style and effectiveness with attention to verbal and nonverbal communication, listening behaviour and conflict. (Offered through Distance Education only.)

### EDRD\*2650 Introduction to Planning and Environmental Law F,W (3-0) [0.50]

The goal of the course is to introduce the students to the principles and processes that govern the management of land use and the protection of the environment. This will be done through an examination of the key legislation and regulations applied to land use and the environment. (Offered through Distance Education format only.)

*Prerequisite(s):* 5.00 credits

### EDRD\*3000 Program Development and Evaluation W (3-0) [0.50]

Concepts and processes of program development and evaluation of rural extension programs. Programs designed with client involvement, situational analysis and priority setting will receive particular attention.

*Prerequisite(s):* 10.00 credits

*Equate(s):* REXT\*3000

### EDRD\*3050 Agricultural Communication I F (3-0) [0.50]

Practical and effective ways of communicating information to a broad audience via the media, focusing mainly on print media (newspapers and magazines) and agricultural media. Strong emphasis on writing and preparing ready-to-use material and strategies for getting it published. (Students will develop an understanding of the news/communications business and find where they can fit into it or use it to their advantage to get a job. Contact with professionals will be a major part of the course).

*Prerequisite(s):* 10.00 credits

*Equate(s):* REXT\*3050 , REXT\*4050

### EDRD\*3120 Educational Communication F (3-0) [0.50]

This course addresses the communication concepts and practices within the formal and non-formal educational contexts. Communication is central to teaching and learning because communication mediates a conscious effort either on the part of the learners to learn, or on the part of the teachers to provide and transfer knowledge, attitudes and skills. (Offered through Distance Education only.)

*Prerequisite(s):* 5.00 credits

*Restriction(s):* REXT\*3100

### EDRD\*3140 Organizational Communication S (3-0) [0.50]

This course explores the application of communication process theory to organizations with special emphasis on internal organizational processes experienced at individual, group and organizational levels. Students examine communication in different organizational contexts including civil society, government, business and transnational corporations. (Offered through Distance Education only.)

*Prerequisite(s):* 5.00 credits

*Restriction(s):* REXT\*3040

### EDRD\*3160 International Communication W (3-0) [0.50]

This course examines the role of communication in global development. Emphasis is on the application of interpersonal, intercultural communications and the mass media in the development process. (Offered through Distance Education only.)

*Prerequisite(s):* 10.00 credits

*Restriction(s):* REXT\*3060

### EDRD\*3400 Sustainable Communities W (2-1) [0.50]

The structure, function and trends affecting agri-food community settings including historical, ecological and social factors, institutions, agencies and change processes are discussed. The agricultural role of the Provincial Government and the contemporary impact of the agro-industrial complex on Ontario communities will be considered mainly from a comparative perspective. Related topics will include physical infrastructure, political conflicts, labour markets, settlement patterns, housing, gender relations, landscape management, quality of life, sustainability and the promotion of community leadership.

*Prerequisite(s):* AGR\*1250 or 10.00 credits

*Restriction(s):* AGR\*3400

### EDRD\*3450 Watershed Planning Practice F,W (3-0) [0.50]

An introduction to the principles and practice of watershed-based planning, with an emphasis on Ontario, but with reference to other parts of Canada, the U.S. and international contexts. History of water resource use and abuse, basic concepts of hydrology, water resource management, ecosystem approaches, and planning theory are also included. (Offered through Distance Education format only.)

*Prerequisite(s):* 10.00 credits or instructor consent

*Equate(s):* UNIV\*3400

### EDRD\*3500 Recreation and Tourism Planning F,W (3-0) [0.50]

Application of planning theory to recreation and tourism in the private and public sectors, approaches to implementing plans, and strategies for involving stakeholders in the planning process. Focus will also be on the impact of various approaches to planning recreation and tourism. (Offered through Distance Education only.)

*Prerequisite(s):* 10.00 credits

*Equate(s):* UNIV\*3500

### EDRD\*4010 Tourism Planning in the Less Developed World W (3-0) [0.50]

This course will provide a discussion and investigation of tourism from an interdisciplinary point of view. The subject of tourism development cuts across many disciplines and is fundamental to a variety of scholars and practitioners working in tourism and development generally. While a variety of important theories and planning practices from a variety of disciplines have been selected for study, planning and community development theory will provide the overarching perspective. The features of planning theories and models stress analysis and intervention into human and environmental systems. This perspective begins with the view that tourism is a complicated human construct and as such needs to be structured and guided in order to maximize the benefits to all stakeholders in the system. (Offered through Distance Education only.)

*Prerequisite(s):* 5 credits

### EDRD\*4020 Rural Extension in Change and Development F (3-0) [0.50]

The planning and management of development programs with emphasis on the role of non-formal education and counselling in influencing behavioral change and adoption of innovation. Case studies include cross cultural and international considerations.

*Prerequisite(s):* 10.00 credits

*Equate(s):* REXT\*4020

### EDRD\*4060 Agricultural Communication II W (3-0) [0.50]

Application of practical and effective writing and communication techniques, mainly through the production of print publications and the further development and application of journalistic writing and editing skills. Special emphasis on issues important to the agri-food industry.

*Prerequisite(s):* 1 of EDRD\*3050, REXT\*3050 , equivalent

*Equate(s):* REXT\*4060

### EDRD\*4120 Leadership Development in Small Organizations F (3-0) [0.50]

The main theories of leadership will be discussed with exploration of the current literature, practice leadership skills and perform relevant activities in an on-line environment. Emphasis will be placed on the communication challenges facing leaders in small organizations and the importance of developing a culture of shared leadership. (Offered through Distance Education only.)

*Prerequisite(s):* 10.00 credits

*Restriction(s):* REXT\*4100

### EDRD\*4500 Planning Industrial Ecology: Design for Sustainability W (3-0) [0.50]

To create ecologically informed and professionally skilled scientists, engineers, planners, and managers by providing them with: systems-analytic frameworks to critically examine processes, products, infrastructure, management systems and public policies from the perspective of environmental sustainability; and the skill set to guide the design of appropriate responses. Course requires a science background, minimum OAC Chemistry or Physics. (Offered through Distance Education only.)

*Prerequisite(s):* 10.00 credits

*Equate(s):* UNIV\*4500

## Engineering

### School of Engineering

*Students who are not registered in the B.Eng. degree program may take no more than 3.00 Engineering (ENGG\*XXXX) credits.*

*Some ENGG\* courses have priority access restrictions. Enrolment in these courses is restricted to students registered in B.Eng. Degree program. All other students will require a waiver form to be signed by the B.Eng. Program Counsellor.*

#### ENGG\*1070 Occupational Health and Safety W (2-0) [0.25]

This course presents the legal implications of occupational health and safety as expressed in the Environmental and Occupational Health and Safety Act, and exposes students to methodologies designed to ensure compliance with the Act. The course stresses safety initiatives and deals with specific safety issues such as noise levels, biosafety, hazardous waste management, safety in the workplace, radiation safety and industrial safety.

*Prerequisite(s):* 10.00 credits

*Restriction(s):* Registration in the B.Eng. Program

#### ENGG\*1100 Engineering and Design I F (2-4) [0.75]

Introduction to engineering and design by means of selected problems. Students integrate basic science, mathematics, and complementary studies to develop and communicate engineering solutions to specific needs using graphical, oral, and written means. Application of computer-aided drafting, spreadsheets, and other tools to simple engineering design problems. The practice of professional engineering and the role of ethics in engineering.

*Restriction(s):* Registration in the B.Eng. Program

#### ENGG\*1210 Engineering Mechanics I F,W (3-1) [0.50]

The fundamental principles of Newtonian mechanics; statics of particles in 2-D space; equilibrium of rigid bodies in 2-D; distributed forces; friction, linear and angular momentum of rigid bodies; conservation of energy; principles of impulse and momentum; and, plane motion of rigid bodies.

#### ENGG\*1500 Engineering Analysis W (3-1) [0.50]

This course deals with engineering applications of matrix algebra, vector spaces and computer techniques to solve linear systems. Topics include linear transformations, eigenvalues and eigenvectors, diagonalization and their applications. Additional topics include complex variable algebra, multi-variable functions, partial derivatives, maxima and minima.

*Prerequisite(s):* MATH\*1200

*Restriction(s):* MATH\*2150

#### ENGG\*2030 Traditional Energy Sources W (3-2) [0.50]

Traditional energy sources are studied from the standpoint of their historical development, the basic physical and chemical processes which underlie their use, to the infrastructure necessary for their exploitation. The maintenance of this infrastructure is examined along with estimated engineering lifetime. The course focuses on electric energy generated by both hydro and fossil fuel combustion, nuclear energy, fossil fuels, and locally used sources such as wood and peat.

*Prerequisite(s):* CHEM\*1040, ENGG\*2120

*Restriction(s):* PHYS\*3080

#### ENGG\*2050 Emerging Energy Systems W (3-3) [0.75]

The basic principles and design of emerging energy systems are covered. The systems which form the basis of the course are solar thermal systems, solar photovoltaic systems, fuel cells, biofuels and wind energy technology. Mechanisms for storing energy generated from each of these systems are studied.

*Prerequisite(s):* ENGG\*2030, PHYS\*1010

#### ENGG\*2100 Engineering and Design II F,W (2-4) [0.75]

This course is a progression in engineering design skills with particular emphasis on computer usage in design, oral communication of solutions and team skills. Computer usage in design will include advanced CAD/CAM/CAE tools; and database management software. An introduction to safety in engineering practice and design, and the concept of sustainable development are covered.

*Prerequisite(s):* Completion of 4.0 credits including ENGG\*1100

#### ENGG\*2120 Material Science F (3-2) [0.50]

Study of the mechanical, electrical, magnetic, optical and thermal properties of solids. Atomic order and disorder in solids, single-phase metals, and multiphase materials (their equilibria and micro-structure) are examined as a basis for understanding the causes of material properties. Interwoven throughout the course is an introduction to materials selection and design considerations.

*Prerequisite(s):* CHEM\*1040, PHYS\*1130

#### ENGG\*2160 Engineering Mechanics II F (3-1) [0.50]

Fundamental principles of the mechanics of deformable materials; stress and strain; Mohr's circle for transformation of stress and strain; deflection under load; design of beams, shafts, columns and pressure vessels; failure theory and design.

*Prerequisite(s):* ENGG\*1210, ENGG\*1500, 0.50 credits in calculus

#### ENGG\*2230 Fluid Mechanics W (3-2) [0.50]

Analysis of steady ideal and viscous fluid flow systems using the Continuity, Bernoulli and Momentum equations. Boundary layer theory is treated in terms of viscous and pressure drag, lift and its importance in heat and mass transfer. Dimensional analysis and dynamic similitude are studied to provide an understanding of flow systems analysis and modeling. Introduction to pipe flow and open channel flow.

*Prerequisite(s):* ENGG\*1210, MATH\*1210

#### ENGG\*2340 Kinematics and Dynamics W (3-3) [0.50]

The course will cover kinematic and dynamic analysis including graphical and analytical methods for kinematic analysis of space, and mechanisms and elementary body motion in space, static and dynamic force analyses of mechanisms, gyroscopic forces, dynamics of reciprocating and rotating machinery, cam and gear mechanisms and specifications. Vibration analysis will deal with free and forced vibration of underdamped lumped systems with multidegrees of freedom, analytical and numerical techniques of solution, viscous damping, vibrational isolation, vibration measurement and control.

*Prerequisite(s):* ENGG\*2160

#### ENGG\*2400 Engineering Systems Analysis F (3-1) [0.50]

Analytical description and modeling of engineering systems such as mechanical, electrical, thermal, hydraulic biological and environmental systems. Applications of multivariable calculus, linear algebra and differential equations to simulate and analyse such systems.

*Prerequisite(s):* ENGG\*1210, ENGG\*1500, MATH\*1200, MATH\*1210, PHYS\*1130

*Co-requisite(s):* MATH\*2270

#### ENGG\*2410 Digital Systems Design Using Descriptive Languages F (3-3) [0.50]

Review of Boolean algebra and truth tables, Karnaugh maps. Design, synthesis and realization of combinational circuits. Design, synthesis and realization of sequential circuits. VHDL: structural modeling, data flow modeling, synchronous & asynchronous behavior descriptions, algorithmic modeling. Designing with PLDs. Digital design with SM charts. Designing with PGAs and complex programmable logical devices. Hardware testing and design for testability. Hierarchy in large designs. The course will primarily be concerned with the design of multi-input, multi-output digital controllers which provide the central control signals that orchestrate the collection of hardware devices (from SSI to VLSI) found in a digital system. An introduction to FPGA-based, as well as microprocessor-based digital systems design will be given. Design examples will include systems such as UART, microcontroller CPU, ALU and data acquisition system.

*Prerequisite(s):* ( CIS\*1650 or CIS\*1500), PHYS\*1130

#### ENGG\*2450 Electric Circuits W (3-2) [0.50]

This course explores the fundamentals of electric circuit analysis. Course topics include: lumped circuit abstraction; circuit elements and their characteristics; Ohm's and Kirchhoff's laws; resistive circuits; nodal and mesh analysis; linearity and superposition principles; fundamental circuit theorems; introduction to the ideal operational amplifier model; energy storage elements and dynamics of first and second order circuits; alternate-current circuits and sinusoidal steady-state analysis with phasor methods; fundamentals of magnetically coupled circuits.

*Prerequisite(s):* ENGG\*2400, (PHYS\*1010 or PHYS\*1130)

#### ENGG\*2550 Water Management W (3-0) [0.50]

The influence of fundamental engineering and hydrologic principles on the choices available for management of water on a watershed basis is demonstrated for representative techniques used in management for water supply, irrigation, flood control, drainage and water pollution control. Selected problems are studies to reveal the technical, environmental, legal, jurisdiction, political, economic and social aspects of water management decisions.

*Prerequisite(s):* (CHEM\*1040 or CHEM\*1310 ), GEOG\*2000

#### ENGG\*2560 Environmental Engineering Systems W (3-2) [0.50]

Analysis techniques for natural and engineered systems including chemical, physical and biological processes. Mass balance analysis for steady state and unsteady state situations. Analysis under both equilibrium and non-equilibrium conditions. Reactor types including batch, plug-flow, CSTR. Noise pollution, control and prevention.

*Prerequisite(s):* CHEM\*1050, MATH\*2270

**ENGG\*2660 Biological Engineering Systems I W (3-1) [0.50]**

This course deals with the mathematical description and identification of biological systems; through mass and energy balances; reactions in biological systems; biomedical, food, and bio-processing applications.

*Prerequisite(s):* ENGG\*2400, MATH\*2270, (1 of BIOL\*1030, BIOL\*1070, BIOL\*1080, BIOL\*1090, MICR\*1020 )

**ENGG\*3030 Energy Distribution F (3-2) [0.50]**

The course deals with the design, modelling and optimization of the most common methods of energy distribution. Major topics to be discussed include electric grid systems and their interaction, feed into grid systems from intermittent power sources, pipeline transportation of gases and fluids, surface transportation on both land and sea. Students will be required to design a distribution system for a specific power source in a given geographic area. (First offering - Fall 2012)

*Prerequisite(s):* ENGG\*2030, ENGG\*2450, ENGG\*3240, ENGG\*3410

**ENGG\*3050 Embedded Reconfigurable Computing Systems W (3-2) [0.50]**

This course introduces the students to the analysis, synthesis and design of embedded systems and implementing them using Field Programmable Gate Arrays. Topics include: review of digital design concepts; Programmable Logic Devices; Field Programmable Logic Devices; physical design automation (partitioning, placement and routing); Hardware Descriptive Languages; VHDL; Verilog; High Level Languages; System-C; Handle-C; Fixed Point and Floating Point Arithmetic; Hardware Accelerators; Reconfigurable Instruction Set Computers; Hardware Software Co-design techniques; Application of Field Programmable Logic in Embedded Systems.

*Prerequisite(s):* ENGG\*3380, ENGG\*3450

**ENGG\*3070 Integrated Manufacturing Systems W (3-2) [0.50]**

Common production machines and manufacturing systems are dealt with, particularly automated systems, robotics, computer control and integration techniques, materials handling, inspection processes and process control. The course addresses societal and environmental issues related to manufacturing.

*Prerequisite(s):* ENGG\*2120, ENGG\*2450

*Co-requisite(s):* ENGG\*3410

**ENGG\*3100 Engineering and Design III W (3-2) [0.75]**

This course combines the knowledge gained in the advanced engineering and basic science courses with the design skills taught in ENGG\*1100 and ENGG\*2100 in solving open-ended problems. These problems are related to the student's major. Additional design tools are presented, including model simulation, sensitivity analysis, linear programming, knowledge-based systems and computer programming. Complementing these tools are discussions on writing and public speaking techniques, codes, safety issues, environmental assessment and professional management. These topics are taught with the consideration of available resources and cost.

*Prerequisite(s):* Registration in the B.Eng. program and completion of 6.00 credits of ENGG courses including ENGG\*2100

*Restriction(s):* Students must have a minimum cumulative average of 60% or higher in ALL ENGG courses. Restriction waiver requests are handled by the Director, School of Engineering, or designate.

**ENGG\*3120 Computer Aided Design and Manufacturing F (3-2) [0.75]**

The course presents the elements of solid modelling, creation of parts of increasing complexity and the assembly of parts to form a final design, along with mechanism simulation. The operation and programming of CNC machines is covered. (First offering - Fall 2012)

*Prerequisite(s):* ENGG\*2100, ENGG\*3280

**ENGG\*3150 Engineering Biomechanics W (3-2) [0.50]**

Basic concepts of biological material structure, properties, adaptation and remodeling; viscoelasticity in biological materials and techniques for modeling viscoelastic material behaviour; 2-dimensional and 3-dimensional joint kinematic analysis techniques; muscle mechanics and optimization techniques; current techniques in laboratory instrumentation and biomedical applications.

*Prerequisite(s):* ENGG\*2160

*Restriction(s):* ENGG\*2150

**ENGG\*3160 Biological Engineering Systems II F (3-2) [0.50]**

Mass transfer in biological systems: concepts; gas-liquid mass transfer; membrane transport processes; and heterogeneous reactions. Applications may include fermenter aeration, tissue perfusion, mass transfer limitations in biofilms, microbial flocs and solid tumours, protein recovery and drug delivery.

*Prerequisite(s):* ENGG\*2230, ENGG\*2660

**ENGG\*3170 Biomaterials F (3-2) [0.50]**

Physical properties of natural and synthetic (e.g. stainless steel, polymers) materials used in biological engineering applications. Topics will include microstructure and mechanical properties of typical biomaterials, quantification of advanced material properties and behaviours, fabrication, compatibility, biodegradation and mechanical failure. Typical applications will include processing of biomaterials as well as equipment and implant design.

*Prerequisite(s):* ENGG\*2120

**ENGG\*3180 Air Quality F (3-2) [0.50]**

The study of the transport, transformation and deposition processes associated with air pollutants. The chemical and biological nature, impacts, and sources of air pollutants. The physical aspects of the atmospheric boundary layer. The mathematical treatment of diffusion in a homogeneous field in a boundary layer. Regulatory approaches worldwide and their use of air quality modeling. The use of models for the design of stacks and monitoring networks.

*Prerequisite(s):* ENGG\*2230, (ENGG\*2560 or ENGG\*2660)

*Co-requisite(s):* ENGG\*3260

**ENGG\*3190 Logic Synthesis W (3-2) [0.50]**

This course presents automatic logic synthesis techniques for computer-aided design (CAD) of very large-scale integrated (VLSI) circuits and systems. Topics covered are: two-level Boolean network optimization, multi-level Boolean network optimization, technology mapping for library-based designs and field-programmable gate-array (FPGA) designs, and state-assignment and re-timing for sequential circuits. The course will also cover various representations of Boolean functions such as binary decision diagrams (BDDs) and discuss their applications to logic synthesis. (First offering - Winter 2013)

*Prerequisite(s):* ENGG\*2410

**ENGG\*3210 Communication Systems W (3-2) [0.50]**

This course is an introduction to the fundamentals of data communication and computer networking. The data communication basics will cover signal transmission and signal encoding techniques such as: multiplexing techniques, signaling, encoding and decoding, error detection and recovery, sliding window techniques. Computer networking basics will cover: communication network components and topologies, multiple access design issues and performance analysis, switching, routing, services and applications, and security. The course will also cover the mathematical tools (Fourier transform, etc.) used in signal analysis.

*Prerequisite(s):* MATH\*2130, STAT\*2120

**ENGG\*3240 Engineering Economics F (3-0) [0.50]**

Principles of project evaluation; analysis of capital and operating costs of engineering alternatives, benefit-cost ratio; break-even studies, evaluations recognizing risk, replacement and retirement of assets; tax considerations, influence of sources of funds.

*Prerequisite(s):* MATH\*1210

*Restriction(s):* Registration in the Engineering program.

**ENGG\*3260 Thermodynamics F (3-2) [0.50]**

This course covers macroscopic thermodynamics and its applications to engineering practice. Topics include properties of pure substances and equilibrium, the First Law of thermodynamics (energy transfer and energy balance in closed and flow systems), the Second Law of thermodynamics and its applications (entropy analysis of closed and flow systems, quantification of irreversibilities and inefficiencies, quality of energy, etc.), thermodynamic cycles and exergy.

*Prerequisite(s):* CHEM\*1040, ENGG\*2230, ENGG\*2400, MATH\*2270

**ENGG\*3280 Machine Design F (3-5) [0.75]**

The course focuses on the important elements of machine design including the influence of design on the manufacturing process chosen to produce a given part. The various fabrication processes used for metals, ceramics, polymers and composites are studied. Failure mechanisms are dealt with along with safety factors and reliability. The design of important machine components is studied, and common failure mechanisms of these components are related to design. A significant part of the course deals with life cycle analysis of manufactured products.

*Prerequisite(s):* ENGG\*2120, ENGG\*2230, ENGG\*2340, ENGG\*2400, ENGG\*2450

**ENGG\*3340 Geographic Information Systems in Environmental Engineering F (3-0) [0.50]**

Geographical information system structure and functions. Data structuring and application program development. Data input, display and analysis. Applications in environmental engineering and natural resource development/management. Students will be able to use a GIS software package to build geographical information systems.

*Prerequisite(s):* (CIS\*1500 or CIS\*1600 ), (1 of MATH\*1000 , MATH\*1080, MATH\*1200)

**ENGG\*3370 Applied Fluids and Thermodynamics W (3-2) [0.50]**

This course builds on the fundamentals of fluid dynamics and thermodynamics introduced in previous courses by looking at relevant applications. Topics to be covered include: heating, ventilation and air conditioning (HVAC); heat engine systems such as the Carnot cycle for refrigeration and heat pumps and the Rankine cycle for vapour power systems; compressible flow, turbomachinery such as pumps, turbines, and propellers; and an introduction to combustion.

*Prerequisite(s):* ENGG\*2230, ENGG\*3260

*Co-requisite(s):* ENGG\*3430

**ENGG\*3380 Computer Organization and Design W (3-2) [0.50]**

This course contains a detailed examination of modern computer organization and techniques for microprocessor architecture design. Topics include - CPU design; instruction set design, addressing modes, operands; data flow design: internal bus structure, data flow signals, registers; control sequence design: hardwired control, decoding, microprogramming; architecture classes: CISC, RISC, and DSP; Memory organization; performance. Students must complete a term project that includes design, implementation, and demonstration of a CPU using a hardware descriptive language like VHDL.

*Prerequisite(s):* ENGG\*2410

**ENGG\*3390 Signal Processing F (3-2) [0.50]**

This course will establish the fundamental analysis and design techniques for signal processing systems. Topics covered include: definition and properties of linear time-invariant systems; impulse response and convolution; continuous-time Laplace transform, Fourier series, Fourier transform; discrete-time Fourier transform, discrete-time Fourier series, fast Fourier transform, Z transform; complex frequency response; filter analysis and design for both continuous and discrete time systems. Students will be able to design continuous-time filters and both design and implement discrete-time digital filters using computer-based tools.

*Prerequisite(s):* ENGG\*2400

**ENGG\*3410 Systems and Control Theory W (3-2) [0.50]**

Modeling, performance analysis and control with potential application to engineering, physical and biological systems. Topics include modeling in time, Laplace and frequency domains. Performance and stability by methods of Hurwitz, Routh, Bode, and Nyquist. Control by ON/OFF and PID Controllers.

*Prerequisite(s):* ENGG\*2400, MATH\*2270

*Co-requisite(s):* ENGG\*2450

**ENGG\*3430 Heat and Mass Transfer W (3-1) [0.50]**

Analysis of steady and transient thermal systems involving heat transfer by conduction, convection and radiation and of mass transfer by molecular diffusion and convection. Other topics include the thermal analysis of heat exchangers and heat transfer systems involving a change of state.

*Prerequisite(s):* ENGG\*2230, ENGG\*3260, MATH\*2270

**ENGG\*3450 Electrical Devices F (3-2) [0.50]**

Semiconductors materials, Silicon, Germanium and other semi-conductors' material, Doping and effects of extrinsic material introduction, conduction in metals and semi-conductors, electrical and thermal characteristics of diodes and transistors; principles of modern electronic devices and their applications in circuits; diodes; bipolar and field effect transistors; circuit integration; operational amplifiers; logic gates.

*Prerequisite(s):* ENGG\*2450

**ENGG\*3470 Mass Transfer Operations W (3-2) [0.50]**

Application of mass transfer principles in natural and engineered systems. Mass transport in the multi-media fate of contaminants in and between air, water and land. Design and analysis of separation processes for emission and pollutant prevention.

*Prerequisite(s):* ENGG\*2230, ENGG\*3260, MATH\*2270

*Co-requisite(s):* ENGG\*3430

**ENGG\*3490 Introduction to Mechatronic Systems Design W (3-2) [0.75]**

This course covers the design of mechatronic systems, which are synergistic, combinations of components and controls drawn from mechanical engineering, electronics, control engineering, and computer science. The course emphasizes the integration of these areas through the design process employing the two skills of (1) modeling, analysis, control design, and computer simulation of dynamic systems, and (2) experimental validation of models, analysis and the understanding of the key issues of hardware implementation. The two skills are developed through assignments emphasizing analytical analysis with complementary laboratory exercises. The material covered includes mechatronic system design; a review of kinematics, electronics, modeling, simulation, signals and control; control architectures; sensors including vision; and actuators.

*Prerequisite(s):* ENGG\*3450

*Co-requisite(s):* ENGG\*3410

*Restriction(s):* ENGG\*3400

**ENGG\*3510 Electromechanical Devices F (3-3) [0.50]**

The aim of this course is to develop an understanding of the electromechanical principles and their applications as electromechanical devices used in engineering. The course covers magnetic fields of currents and coils; magnetic materials; magnetic circuits; induced, electric and magnetic fields (EMF), inductance, transformers magnetic forces, permanent magnets and electromagnets. The course examines the principles of variable-reluctance devices, stepper motors, moving-coil devices, direct current (DC) and alternating current (AC) motors.

*Prerequisite(s):* ENGG\*2160, ENGG\*2450, PHYS\*1010

**ENGG\*3570 MEMS and Microfabrication F (3-2) [0.50]**

This course presents a broad survey of micro-electro-mechanical systems (MEMS) and microfabrication technologies. It covers silicon and non-silicon microfabrication techniques for microsensors, microactuators, and nanotechnology. It introduces CAD tools and mechanical and electrical issues in designing devices such as micromotors, grippers, accelerometers, and pressure sensors. It discusses limitations and challenges in design and fabrication of MEMS and enables the application of general micromachining principles to developing novel devices. (First offering - Fall 2012)

*Prerequisite(s):* ENGG\*2450, PHYS\*1010

**ENGG\*3590 Water Quality F (3-3) [0.50]**

This course builds on the student's experience in chemistry, biology, physics and fluid mechanics, and provides an engineering perspective on: (i) standard methods of water quality analysis for physical, chemical and biological characteristics of water; (ii) significance and interpretation of analytical results, (iii) modeling of water quality in natural systems and (iv) introduction to engineered water and wastewater treatment systems.

*Prerequisite(s):* ENGG\*2230, ENGG\*2560, (1 of BIOL\*1040, BIOL\*1090, MICR\*1020, MICR\*2420), STAT\*2120

**ENGG\*3640 Microcomputer Interfacing F (3-3) [0.50]**

This course focuses on the subject of interfacing microcomputers to external equipment. Topics include peripheral devices, hardware interfaces, device driver software and real time programming. Advanced programming: debugging of embedded systems, data structures and subroutine calls, high-level system programming. Interrupts and resets, real time events, signal generation and timing measurements. Synchronous and asynchronous serial communication. Parallel I/O ports and synchronization techniques. I/O interfacing, microcomputer busses, memory interfacing and direct memory access (DMA). Data acquisition topics include signal conditioning analog to digital conversion and digital signal processing.

*Prerequisite(s):* ENGG\*2410, ENGG\*2450

*Restriction(s):* ENGG\*4640

**ENGG\*3650 Hydrology F (3-1) [0.50]**

Quantitative study of natural water circulation systems with emphasis on basic physical principles and interrelationships among major processes; characteristics of mass and energy; inputs to and output from watersheds; factors governing precipitation occurrence, evaporation rates, soil-water storage changes, groundwater recharge and discharge, run-off generation; methods of streamflow analysis; mathematical modeling.

*Prerequisite(s):* (ENGG\*2230 or MET\*2030), (MATH\*1210 or MATH\*2080), (STAT\*2120 or STAT\*2040), and competency in computing

**ENGG\*3670 Soil Mechanics F (3-2) [0.50]**

Relations of soil physical and chemical properties to strength; soil water systems and interactive forces. Visco-elastic property and pressure-volume relationships of soil systems. Stress-strain characteristics of soil under dynamic loads. Application of engineering problems. Laboratory and field investigation methods.

*Prerequisite(s):* ENGG\*2120, ENGG\*2230

**ENGG\*3700 Optimization for Engineers F (3-2) [0.50]**

This course serves as an introduction to combinatorics and optimization and discusses classical direct search-for-optimum methods for constrained optimization, including linear and quadratic programming, and others. Topics to be covered include: complexity theory, linear integer programming technique, constrained/unconstrained optimization and heuristic search techniques such as tabu search, genetic algorithms, particle swarm optimization, simulated annealing and GRASP.

*Prerequisite(s):* CIS\*1500, MATH\*2130, MATH\*2270

**ENGG\*3830 Bio-Process Engineering F (3-1) [0.50]**

Application of engineering principles to the processing of biological products in the biological and food industry. Analysis and design of unit processes such as sedimentation, centrifugation, filtration, milling and mixing involving rheology and non-Newtonian fluid dynamics of biological materials. Analysis of heat and mass balances for drying evaporation, distillation and extraction.

*Prerequisite(s):* ENGG\*2230, ENGG\*2660

*Co-requisite(s):* ENGG\*3260

**ENGG\*4030 Manufacturing System Design W (3-3) [0.75]**

Students work in groups to design a manufacturing system to produce a specific product. Choices must be made about the materials to be used, the methods to manufacture each part of the product and the final assembly and/or packaging process. Attention is paid to economics and efficiency of the overall manufacturing system. (First offering - Winter 2013)

*Prerequisite(s):* ENGG\*3070, ENGG\*3120, ENGG\*3510, ENGG\*4460

*Co-requisite(s):* ENGG\*4050, ENGG\*4280

**ENGG\*4040 Medical Imaging Modalities F (3-2) [0.50]**

The course will cover the basic knowledge of medical imaging systems, how they operate and to what uses they can be applied. Systems covered will include x-ray radiography, computed tomography, magnetic resonance imaging, positron emission tomography, gamma cameras, and ultrasound imaging. Emphasis will be on the underlying physics and computation, highlighting factors affecting image quality, patient safety, and clinical use. (First offering - Fall 2013)

*Prerequisite(s):* MATH\*1210, PHYS\*1130

*Restriction(s):* Instructor consent required.

**ENGG\*4050 Quality Control W (3-2) [0.50]**

The basic techniques and regulations surrounding quality control in a generic manufacturing environment are covered. The topics covered include the statistics of sampling, sampling rates and measurements. Destructive and non destructive methodologies of product examination are discussed. The student is exposed to relevant ISO and related regulations, and through case studies is given the opportunity to see how these regulations are implemented in local industries. (First offering - Winter 2013)

*Prerequisite(s):* STAT\*2120

**ENGG\*4060 Biomedical Signals Processing W (3-2) [0.50]**

This course will cover the generation of biomedical signals, detection and measurement, and processing. The physiology of electrical signal generation will cover ionic transport in cellular membranes and propagation of electrical signals in cells and tissues. The range of biomedical signals covered includes such common signals as the electromyogram (EMG), the electrocardiogram (ECG), the electroencephalogram (EEG). Detection and measurement will cover electrode technology, instrumentation amplifiers and safety concerns. Processing includes filtering, frequency content analysis, removal of artifacts, signal correlation, and event detection (First offering - Winter 2014)

*Prerequisite(s):* ENGG\*3390

*Restriction(s):* Instructor consent required.

**ENGG\*4080 Micro and Nano-Scale Electronics F (3-2) [0.50]**

The purpose of this course is to describe the operating principles of analog integrated micro and nano electronic circuits and to teach how to design and use such circuits systems. Course topics include: device and circuit fabrication in silicon and non-silicon based technologies; operation and layout of active and passive elements; analog and switched-capacitor filters; analog-to-digital and digital-to-analog converters; amplifiers; oscillators and circuits for radio-frequency and optical communications; readout channels for integrated sensors, and analog integrated circuits for mechatronics and bioengineering. The main emphasis is on device models, circuit operation, and design techniques.

*Prerequisite(s):* ENGG\*3450

**ENGG\*4090 Food and Beverage Engineering W (3-3) [0.75]**

Students work in groups to design a system for manufacturing a specific food or beverage product. Choices are made about the specific processes to be used, the final packaging and marketing of the product. Attention is paid to the economics and efficiency of the overall production process. (First offering - Winter 2013)

*Prerequisite(s):* ENGG\*3070, ENGG\*3510, MICR\*1020

*Co-requisite(s):* ENGG\*2660, ENGG\*4050, ENGG\*4280

**ENGG\*4110 Biological Engineering Design IV F,W (3-5) [1.00]**

This is the capstone design course for the Biological Engineering program. Teams normally of 3-4 students apply engineering analysis and design principles to a problem in a biological system or process. A completely specified solution at the level of preliminary or final design is required, including assessment of socio-economic and environmental impact. This is a small group design that requires reports and a poster presentation to a professional standard. Ethics and legal case studies relevant to professional engineering practice are presented during the lectures.

*Prerequisite(s):* All 1000 and 2000 level core credits, ENGG\*3100.

*Restriction(s):* Registration in semester 8 (last semester) of the B.Eng. program and in a max. of 3.25 credits registration. Students must have a minimum cumulative average of 60% or higher in ALL ENGG courses. Instructor consent required. Restriction waiver requests are handled by the Director, School of Engineering, or designate.

**ENGG\*4120 Engineering Systems and Computing Design IV F,W (3-5) [1.00]**

This is the capstone design course for the Engineering Systems and Computing program. Teams normally of 3-4 students apply engineering analysis and design principles to a problem involving control system, computer hardware or computer software technology. A completely specified solution at the level of preliminary or final design is required, including assessment of socio-economic and environmental impact. This is a small group design that requires reports and a poster presentation to a professional standard. Ethics and legal case studies relevant to professional engineering practice are presented during the lectures.

*Prerequisite(s):* All 1000 and 2000 level core credits, ENGG\*3100.

*Restriction(s):* Registration in semester 8 (last semester) of the B.Eng. program and in a max. of 3.25 credits registration. Students must have a minimum cumulative average of 60% or higher in ALL ENGG courses. Instructor consent required. Restriction waiver requests are handled by the Director, School of Engineering, or designate.

**ENGG\*4130 Environmental Engineering Design IV F,W (3-5) [1.00]**

This is the capstone design course for the Environmental Engineering program. Teams normally of 3-4 students apply engineering analysis and design principles to an environmental engineering problem. A completely specified solution at the level of preliminary or final design is required, including assessment of socio-economic and environmental impact. This is a small group design that requires reports and a poster presentation to a professional standard. Ethics and legal case studies relevant to professional engineering practice are presented during the lectures.

*Prerequisite(s):* All 1000 and 2000 level core credits, ENGG\*3100.

*Restriction(s):* Registration in semester 8 (last semester) of the B.Eng. program and in a max. of 3.25 credits registration. Students must have a minimum cumulative average of 60% or higher in ALL ENGG courses. Instructor consent required. Restriction waiver requests are handled by the Director, School of Engineering, or designate.

**ENGG\*4150 Water Resources Engineering Design IV F,W (3-5) [1.00]**

This is the capstone design course for the Water Resources Engineering program. Teams normally of 3-4 students apply engineering analysis and design principles to a problem involving water resources or wastewater engineering. A completely specified solution at the level of preliminary or final design is required, including assessment of socio-economic and environmental impact. This is a small group design that requires reports and a poster presentation to a professional standard. Ethics and legal case studies relevant to professional engineering practice are presented during the lectures. (First offering Winter 2013)

*Prerequisite(s):* All 1000 and 2000 level core credits, ENGG\*3100.

*Restriction(s):* Registration in semester 8 (last semester) of the B.Eng. program and in a max. of 3.25 credits registration. Students must have a minimum cumulative average of 60% or higher in ALL ENGG courses. Instructor consent required. Restriction waiver requests are handled by the Director, School of Engineering, or designate.

**ENGG\*4160 Mechanical Engineering Design IV F,W (3-5) [1.00]**

This is the capstone design course for the Mechanical Engineering program. Teams normally of 3-4 students apply engineering analysis and design principles to a mechanical engineering problem. A completely specified solution at the level of preliminary or final design is required, including assessment of socio-economic and environmental impact. This is a small group design that requires reports and a poster presentation to a professional standard. Ethics and legal case studies relevant to professional engineering practice are presented during the lectures. (First offering Winter 2013)

*Prerequisite(s):* All 1000 and 2000 level core courses and ENGG\*3100

*Restriction(s):* Registration in semester 8 (last semester) of the B.Eng. program with a maximum 3.25 credits registration. Students must have a minimum cumulative average of 60% or higher in n ALL ENGG courses. Instructor consent required. Restriction waiver requests are handled by the Director, School of Engineering, or designate.

**ENGG\*4170 Computer Engineering Design IV F,W (3-5) [1.00]**

This is the capstone design course for the Computer Engineering program. Teams of normally 3-4 students apply engineering analysis and design principles to a computer engineering problem. A completely specified solution at the level of preliminary or final design is required, including assessment of socio-economic and environmental impact. This is a small group design that requires reports and a poster presentation to a professional standard. Ethics and legal case studies relevant to professional engineering practice are presented during the lectures. (First offering - Winter 2014)

*Prerequisite(s):* All 1000 and 2000 level core courses and ENGG\*3100

*Restriction(s):* Registration in semester 8 (last semester) of the B.Eng. program with a maximum 3.25 credits registration. Students must have a minimum cumulative average of 60% or higher in n ALL ENGG courses. Instructor consent required. Restriction waiver requests are handled by the Director, School of Engineering, or designate.

**ENGG\*4180 Biomedical Engineering Design IV F,W (3-5) [1.00]**

This is the capstone design course for the Biomedical Engineering program. Teams normally of 3-4 students apply engineering analysis and design principles to a biomedical engineering problem. A completely specified solution at the level of preliminary or final design is required, including assessment of socio-economic and environmental impact. This is a small group design that requires reports and a poster presentation to a professional standard. Ethics and legal case studies relevant to professional engineering practice are presented during the lectures. (First offering - Winter 2014)

*Prerequisite(s):* All 1000 and 2000 level core courses and ENGG\*3100

*Restriction(s):* Registration in semester 8 (last semester) of the B.Eng. program with a maximum 3.25 credits registration. Students must have a minimum cumulative average of 60% or higher in n ALL ENGG courses. Instructor consent required. Restriction waiver requests are handled by the Director, School of Engineering, or designate.

**ENGG\*4220 Interdisciplinary Mechanical Engineering Design W (3-3) [0.75]**

This is a general design course for students registered in the B. Eng. major in mechanical engineering who wish to develop a broad based mechanical engineering foundation. Students work in groups to develop a general mechanical engineering design. Special attention is paid to the sustainability of the design, its economic feasibility and overall efficiency. (First offering - Winter 2013)

*Prerequisite(s):* ENGG\*3100

**ENGG\*4250 Watershed Systems Design W (3-2) [0.75]**

This course is a hydrological analysis of watershed systems including stream flow for design of structures and channels, flood warning, flood plain mapping and low-flow characteristics. Hydraulic analysis is applied to the design of dams, reservoirs, control structures, energy dissipation structures, bridges and culverts. An analysis of steady flow profiles, flood waves, and sediment transport is applied in the design of natural and constructed channels and protective works for rivers to achieve environmentally sustainable land use in watershed systems.

*Prerequisite(s):* ENGG\*2230, ENGG\*3650

**ENGG\*4260 Water and Wastewater Treatment Design W (3-2) [0.75]**

Application of design principles for a variety of water purification systems, including drinking water, municipal wastewater, industrial wastewater and agricultural wastewater. This involves the design of physical, chemical and biological unit operations, and evaluating the optimum combination to satisfy the given design constraints and criteria. The optimum designs integrate engineering science, basic science, economics, and occupational health and safety for the workers and the public.

*Prerequisite(s):* ENGG\*3100, ENGG\*3590

**ENGG\*4280 Digital Process Control Design W (3-2) [0.75]**

Design, analysis synthesis and simulation of process control and automation systems. Automation hardware, process compensation techniques and P.I.D. controllers, design and dynamics of final control elements, computer control and the microprocessor.

*Prerequisite(s):* ENGG\*3410

**ENGG\*4300 Food Processing Engineering Design F (3-2) [0.75]**

Formulation of mathematical models to describe food processing operations and the response of foods to such operations. Process evaluation, development and computer-aided design of operations such as thermal processes and food freezing. The influence of water activity and structure on the enzymatic, cellular, organic and structural systems of foods. The properties of powders and particulate foods and mechanical operations with solid foods.

*Prerequisite(s):* ENGG\*3260, ENGG\*3830

**ENGG\*4310 Wind and Solar Energy Design W (3-3) [0.75]**

Students are required to design a wind and a solar energy system with output specifications determined by the instructor. Each design team will generate a proposal followed by the construction of a working prototype. The project will be staged with deliverables due on specified dates. (First offering - Winter 2013)

*Prerequisite(s):* ENGG\*2050, ENGG\*2450, ENGG\*3100

*Co-requisite(s):* ENGG\*4350

**ENGG\*4330 Air Pollution Control F (3-2) [0.75]**

Analysis and design of atmospheric pollution control techniques. Techniques considered include both in-process solutions as well as conventional end-of-pipe treatments. Pollutants covered include gaseous, particulate, metals and trace organics.

*Prerequisite(s):* ENGG\*3180, ENGG\*3260

**ENGG\*4340 Solid and Hazardous Waste Management F (3-2) [0.50]**

Solid waste generation rates and waste composition. Integrated waste management: collection, recovery, reuse, recycling, energy-from-waste, and landfilling. Biological treatment of the organic waste fraction - direct land application, composting, anaerobic digestion. Environmental impact of waste management and sustainable development. Cross media issues related to solid waste disposal. An introduction to hazardous waste management and treatment methods.

*Prerequisite(s):* ENGG\*2560 or ENGG\*2660

**ENGG\*4350 Energy Economics W (3-2) [0.50]**

The economics of energy production, delivery and distribution are studied in a lecture and case study format. Some of the major considerations include the economic-political relationship in the petroleum industry as well as the economics surrounding the production and delivery of bio-fuels and electricity. The various energy sources are studied from the viewpoint of the capital investment necessary to produce and deliver energy (First offering - Winter 2013)

*Prerequisite(s):* ENGG\*2050, ENGG\*3240

**ENGG\*4360 Soil-Water Conservation Systems Design F (3-2) [0.75]**

Properties of soils and land use governing the occurrence and magnitude of overland flow, soil erosion, infiltration, percolation of soil water, and variations in soil water storage. Design of soil and water management systems and structures to control soil erosion and protect water quality for environmentally and economically sustainable land use planning. Design of surface and subsurface drainage systems for rural land. Design of sprinkler and trickle irrigation systems.

*Prerequisite(s):* ENGG\*2230, ENGG\*3650, ENGG\*3670

**ENGG\*4370 Urban Water Systems Design F (3-2) [0.75]**

Estimation of water quantity and quality needed for urban water supply and drainage. Design of water supply, pumping systems, pipe networks and distributed storage reservoirs from analysis of steady and transient, pressurized and free surface flow. Rates of generation of flows and pollutants to sanitary and storm sewers, design of buried pipe and open channel drainage systems with structures for flow and pollution control. Modeling of water systems for sustainable urban development.

*Prerequisite(s):* ENGG\*2230, ENGG\*3650

**ENGG\*4380 Bioreactor Design W (3-2) [0.75]**

Topics in this course include: modeling and design of batch and continuous bioreactors based on biological growth kinetics and mass balances; gas-liquid mass transfer for aeration and agitation; instrumentation; and control.

*Prerequisite(s):* ENGG\*3160

**ENGG\*4390 Bio-instrumentation Design F (3-2) [0.75]**

Theory and selection criteria of devices used in measurements in biological systems; design of complete measurement systems including transducers, signal conditioning and recording components; error analysis. Differences between measurements in biological and physical systems.

*Prerequisite(s):* ENGG\*3450

**ENGG\*4400 Biomechanical Engineering Design F (3-2) [0.75]**

Concept development, design, modeling, manufacture and testing of medical implants and tools. This course will investigate the biomechanical factors influencing design, regulatory issues, current development trends, and the possible future of medical implant technology.

*Prerequisite(s):* ENGG\*2120

*Co-requisite(s):* ENGG\*3170

**ENGG\*4420 Real-time Systems Design F (3-3) [0.75]**

Hard versus soft real-time systems. Real-time issues in computer architecture. Clocks and timing issues. Correctness and predictability. Structuring and describing real-time software. Clock Synchronization. Real-time objects and atomicity. Validation of timing constraints. Formal Real-time systems design and analysis techniques: process-based, event-based, and Petri Nets. Resource management and control. Real-time scheduling and task allocation (Uni-processor and Multi-processor). Design for dependability, reliability and fault tolerance. Real-time programming using ADA. Survey of Real-time operating systems. Scenarios of real-time systems.

*Prerequisite(s):* CIS\*3110

**ENGG\*4430 Neuro-Fuzzy and Soft Computing Systems W (3-0) [0.50]**

Introduction to Fuzzy systems; Fuzzy Sets; Fuzzy Rules and Fuzzy Reasoning; Fuzzy Inference Systems; Fuzzy Control; Introduction to Neural and Automata Networks; Neural Network Paradigms; Supervised Learning Neural Networks, Learning from Reinforcement, Unsupervised Learning and Other Neural Networks; Neurocontrol; System Identification; Controller Training, Robust Neurocontrol; Adaptive Neuro-Fuzzy Inference Systems, Coactive Neuro-Fuzzy Modeling; Reinforcement Learning Control, Gradient-Free Optimization, Feedback Linearization and Sliding Control; Applications: Quality Assurance, Decision Aid Systems, Automatic Character Recognition, Inverse Kinematics Problems, Automobile MPG (Miles Per Gallon) Prediction, System Identification, Channel Equalization, Adaptive Noise Cancellation, Process Control.

*Prerequisite(s):* ENGG\*3410

*Co-requisite(s):* ENGG\*4280

**ENGG\*4440 Computational Fluid Dynamics W (3-2) [0.50]**

Computational methods for fluid mechanics form the core of the course. The concepts of modelling are covered including numerical analysis, the governing equations for fluid problems and finite discretization methods. Mathematical models for turbulence are presented and the student is exposed to the use of commercial software for the solution of complex problems in fluid dynamics. (First offering Winter 2013.)

*Prerequisite(s):* ENGG\*2230, ENGG\*3370

**ENGG\*4450 Large-Scale Software Architecture Engineering F (3-2) [0.50]**

This course introduces the students to the analysis, synthesis and design of large-scale software systems at the architectural level. This is in contrast to the algorithmic and data structure viewpoint of most software systems. Large-scale software systems are complex, execute on many processors, under different operating systems, use a particular or many language(s) of implementation, and typically rely on system layers, network connectivity, messaging and data management and hardware interfacing. The material covered includes architectural styles, case studies, architectural design techniques, formal models, specifications and architectural design tools. The laboratory sessions will expose the students to analyzing and redesigning an existing large-scale software system.

*Prerequisite(s):* ( CIS\*2420 or CIS\*2520), ENGG\*2100

**ENGG\*4460 Robotic Systems F (3-3) [0.50]**

This course covers robot technology fundamentals, mathematical representation of kinematics, planning and execution of robot trajectories, introduction to robot languages, programming of robotic systems, different application domains for robots (e.g. assembly, manufacturing, medical, services, etc.), and robot sensors. The goal of this course is to provide students with a comprehensive background, approaches and skills to apply robotics technology to real world engineering applications and problems.

*Prerequisite(s):* ENGG\*1500, ENGG\*2400

**ENGG\*4470 Finite Element Analysis F (3-2) [0.50]**

The theory of finite element analysis is presented including element derivation and solution procedures. Students use a finite element package to solve problems based on static and dynamic applications in mechanical systems. Examples are chosen from classical machines as well as biological systems.

*Prerequisite(s):* ENGG\*2340, MATH\*2130, MATH\*2270

**ENGG\*4480 Advanced Mechatronic Systems Design W (3-3) [0.75]**

The aim of this course is to build on the ideas and concepts introduced in ENGG\*3490. The course covers signal conditioning, system calibration, system models, dynamic models, large scale systems, networking, microprocessors, programmable logic controllers, communication systems and fault finding. (First offering Winter 2013.)

*Prerequisite(s):* ENGG\*3490, ENGG\*3640, ENGG\*4460

**ENGG\*4510 Assessment & Management of Risk W (3-1) [0.50]**

This course will develop the bases by which risk to human health and the environment can be assessed. Issues of hazardous waste cleanups, permitting of water and air discharges, food safety, flood protection, as examples, are addressed. The course also examines how decisions are made to manage the risks to acceptable levels.

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

**ENGG\*4540 Advanced Computer Architecture W (3-2) [0.50]**

This course covers topics such as: basics of pipeline structure, advanced pipelining and instruction level parallelism, multiprocessor and thread-level parallelism, memory-hierarchy design (main memory, virtual memory, caches), storage systems, interconnection networks, multiprocessor architectures (centralized and distributed). Advanced topics related to new emerging computer architectures will also be presented. The emphasis in each topic is on fundamental limitations and the trade-offs involved in designing computer systems, including memory and processing bandwidth, network bandwidth and latency, synchronization, and storage system bandwidth and latency. (First offering Winter 2013.)

*Prerequisite(s):* ENGG\*3210, ENGG\*3380

**ENGG\*4550 VLSI Digital Design W (3-2) [0.50]**

This course introduces the students to the analysis, synthesis and design of Very Large Scale integration (VLSI) digital circuits and implementing them in silicon. The topics of this course are presented at three levels of design abstraction. At device level: MOS diode; MOS (FET) transistor; interconnect wire. At circuit level: CMOS inverter; static CMOS gates (NAND, NOR); dynamic gates (NAND, NOR); static latches and registers; dynamic latches and registers; pipelining principles and circuit styles; BICMOS logic circuits. At system level; implementation strategies for digital ICs; interconnect at system level; timing issues in digital circuits (clock structures); the adder; the multiplier; the shifter; memory design and array structure; low power design circuits and architectures.

*Prerequisite(s):* ENGG\*2410, ENGG\*2450, ENGG\*3450

**ENGG\*4560 Embedded System Design W (3-3) [0.75]**

This course introduces the basic principles of embedded system design. It utilizes advanced hardware/software abstractions to help design complex systems. Topics include: design of embedded CUPs; embedded architecture cores; system-on-chip designs and integration using processor cores and dedicated core modules; embedded computing platforms; embedded programming design and analysis; processes and operating systems; networks for embedded systems; distributed embedded architectures; design examples that target robotics, automobile, and communication systems.

*Prerequisite(s):* ENGG\*4550

*Co-requisite(s):* ENGG\*3050

**ENGG\*4650 Integrated Sensors and Photonic Devices F (3-2) [0.50]**

This course presents an overview and the principles of operation of integrated solid-state sensors and sensing systems. It studies the microstructures for the measurement of visible and infrared radiation, pressure, acceleration, temperature, gas purity, and ion concentrations. Topics include transduction mechanisms, design parameters, fabrication technologies, and applications. The course will also explore the theoretical and practical aspects of current photonic devices and applications based on linear and nonlinear optics. (First offering - Fall 2013)

*Prerequisite(s):* CHEM\*1040, ENGG\*2450, PHYS\*1010

**ENGG\*4660 Medical Image Processing W (3-2) [0.50]**

This course covers the fundamentals of medical imaging from both the processing of digital images and the physics of image formation. Image processing topics covered include: fundamentals of resolution and quantization; linear systems as applied to multi-dimensional continuous and discrete systems including the relationship between the point spread functions and modulation transfer function; point operations such as contrast enhancement, histogram equalization, and H and D curves, geometric operations for distortion correction, including interpolation methods; linear filtering in both the spatial and spatial-frequency domains; and image restoration and inverse filtering. The physics of the following imaging modalities with emphasis on the parameters which effect image quality will be covered: x-ray radiology, MRI, ultrasound, and nuclear medicine.

*Prerequisite(s):* ENGG\*3390

**ENGG\*4680 Multidisciplinary Engineering Design W (2-4) [0.75]**

This is a general design course for students registered in the B. Eng. major in Biomedical Engineering and who do not wish to develop a strong specialization in one of the specific areas of the program. Students work in groups to develop a general Biomedical engineering design. Special attention is paid to the sustainability of the design, its economic feasibility and overall efficiency. (First offering - Winter 2013)

*Prerequisite(s):* ENGG\*3100

**ENGG\*4720 Physical Design Automation W (3-2) [0.50]**

This course presents the applications of a number of important optimization techniques (such as linear programming, integer programming, simulated annealing, and genetic algorithms) to various design-automation problems, including: logic partitioning, floorplanning, placement, global routing, detailed routing, compaction, and performance-driven layout. (First offering - Winter 2013)

*Prerequisite(s):* CIS\*2500, CIS\*3490, ENGG\*3700



## English

### School of English and Theatre Studies

1. ENGL\*1080 and ENGL\*2080 provide a strong foundation for English studies at the University level and are required courses for students intending to major or minor in English. These linked courses expose students not only to a broad range of texts from different countries and historical periods but also to some of the exciting developments in the discipline.
2. Honours major students are required to take the seminar courses ENGL\*2120, ENGL\*2130, ENGL\*3940, ENGL\*3960, preferably in their 3rd, 4th, 5th and 6th semesters. ENGL\*1080 is a pre-requisite to ENGL\*2120 and ENGL\*2130; ENGL\*2080 is a pre-requisite to ENGL\*3940 and ENGL\*3960.
3. Honours major students are required to take **two** 4000-level seminars, preferably in their 7th and 8th semesters. The prerequisites for the 4000-level seminars are ENGL\*2080 plus **one** of ENGL\*2120, ENGL\*2130 plus **one** of ENGL\*3940, ENGL\*3960.
4. Honours minor students are required to take the seminar course ENGL\*2120 and **one** of ENGL\*2130, ENGL\*3940, ENGL\*3960, preferably in their 3rd to 6th semester.
5. Many English lecture courses are offered on alternate years only and many English seminars have variable content. For more information, students should consult the School's home page at <http://www.arts.uoguelph.ca/sets/>.
6. Many English lecture courses are reading-intensive while seminar courses are writing and presentation-intensive. Honours major students are advised to take **two** lectures and **one** seminar per semester beginning in their 3rd semester.
7. WRITING- AND PRESENTATION-INTENSIVE: Seminars emphasize written and oral work to help students develop the critical reading and writing skills essential to their learning throughout the curriculum.
8. READING-INTENSIVE: Lectures emphasize breadth of reading, contexts, and comparisons, to help students develop the knowledge base essential to their understanding of the field. In order to allow essay-writing to be concentrated in seminars, assignments in lecture courses will not predominantly take the traditional essay form but a range of other formats.

#### ENGL\*1080 Literatures in English I: Reading the Past F,W (3-0) [0.50]

This course is focused on the disciplinary skill of close reading and is intended for students planning to specialize in the study of English Literature. Through a series of case studies, the course introduces students to a range of historical and national writings in prose, poetry, and drama, and to some of the key terms and concepts in contemporary literary studies. Lectures and discussions address selected works from the Middle Ages onwards, the periods in which these works were produced, and some of the ways in which these texts have been or could be interpreted. ENGL\*1080 and its companion course, ENGL\*2080, are required for a major or minor in English. Students are encouraged to enrol in ENGL\*2080 in the semester after they have completed ENGL\*1080. Reading - and writing-intensive course.

*Equate(s):* ENGL\*1060

*Restriction(s):* Registration in the English major, minor or area of concentration, or in semesters one or two of the BA or BAS program.

#### ENGL\*1200 Reading the Contemporary World F,W (3-0) [0.50]

This course, which is designed primarily for those not planning a specialization in English, introduces students to literary texts and persuasive forms of writing, bringing to the fore some of the links between language and contemporary social and political issues. Course materials will represent diversity in terms of national origins, gender, race, and class. The course emphasizes the use of figurative language as well as the development of students' critical reading and writing skills. Students planning to major or minor or pursue an area of concentration in English must take ENGL\*1080 and ENGL\*2080, but may also take ENGL\*1200 and count it as an elective lecture. (Also offered in Distance Education format.)

#### ENGL\*1410 Major Writers U (3-0) [0.50]

This course, which is designed primarily for those not planning a specialization in English, offers an introduction to the study of literature through a chronological consideration of works by selected major authors from the Middle Ages to the present century, in relation to their social, intellectual and literary backgrounds. The course emphasizes the use of figurative language as well as the development of students' critical reading and writing skills. Students planning to major or minor or pursue an area of concentration in English must take ENGL\*1080 and ENGL\*2080, but may also take ENGL\*1410.

#### ENGL\*2040 Latina/o Literature and Cultural Production: Intro F (3-0) [0.50]

This survey course introduces students to the terms, methodologies, and debates that form the interdisciplinary critical practice of Latina/o Studies. The course takes a pan-Latina/o approach to the study of English-language and cultural production by various Latina/os primarily in the U.S. Because different Latina/o groups have been concentrated in particular U.S. regions and cities, the approach allows students to study how Latina/o literature and art have shaped the politics and culture of different regions and cities. Reading-intensive course. (Offered in odd-numbered years.)

*Prerequisite(s):* 1 of THST\*1040, ENGL\*1080, ENGL\*1200

#### ENGL\*2080 Literatures in English II: Finding a Critical Voice F,W (3-0) [0.50]

This course revisits the historical, national, and genre sweep of ENGL\*1080 by conducting a range of specific, more in-depth studies of particular works (including some of the texts examined in ENGL\*1080) in their historical moments. Seminars help students to develop a range of critical approaches through oral presentations and essay-writing. Students are encouraged to enrol in ENGL\*2080 in the semester after they have completed ENGL\*1080.

*Prerequisite(s):* ENGL\*1080

*Equate(s):* ENGL\*2060

#### ENGL\*2120 Seminar: Critical Practices F,W (3-0) [0.50]

This course guides students through a range of critical approaches and explores their implications for readings of a limited number of literary texts. The seminar's main areas of concentration are: (1) close reading, centering on the way a particular poem, work of fiction, or play works in its details and overall structure; (2) critical approaches and methodologies; (3) critical writing and discussion. (Choices of approaches and texts will be determined by individual instructors.) Writing- and presentation-intensive course.

*Prerequisite(s):* ENGL\*1080

#### ENGL\*2130 Seminar: Literature and Social Change F,W (3-0) [0.50]

This course explores the social and cultural work that literary texts perform. Seminars will illuminate such categories as gender, sexuality, nation, race, ethnicity, and class; particular ways in which they are written into a limited number of literary works; and some of the critical debates surrounding our interpretations of those processes. (Choices of approaches and texts will be determined by individual instructors.) Writing- and presentation-intensive course.

*Prerequisite(s):* ENGL\*1080

#### ENGL\*2190 Representation and Sexuality W (3-0) [0.50]

This variable-content course offers a historically grounded introduction to the critical study of sexuality and representation in literature and related media. The course may engage with a specific time-period or genre, or it may concentrate directly on the problem of theorizing sexual difference in relation to other literary and cultural forces. (Offered in odd-numbered years.)

*Prerequisite(s):* 1 of ENGL\*1080, ENGL\*1200, ENGL\*1410, WMST\*1000

#### ENGL\*2200 Postcolonial Literatures F (3-0) [0.50]

This course introduces significant issues, perspectives, and voices within the study of the postcolonial literatures in English. The course may include literature from Africa, Australia, Canada, the Caribbean, India and the Pacific. Reading-intensive course.

*Prerequisite(s):* 1 of ENGL\*1080, ENGL\*1200, ENGL\*1410

#### ENGL\*2230 Popular Genres F (3-0) [0.50]

This variable-content course introduces students to the focused study of a selected popular genre of literature, film, or other related media. The course explores the emergence and development of the popular genre chosen for that semester's study, such as science fiction, detective fiction, romance, the western, film noir, or the fairy tale; diverse critical approaches to the genre; and some meanings of the term "popular". Reading-intensive course. (Offered in even-numbered years.)

*Prerequisite(s):* 1 of ENGL\*1080, ENGL\*1200, ENGL\*1410

#### ENGL\*2550 North American Native Literatures W (3-0) [0.50]

This course explores selected issues, perspectives, and voices within the study of Native literatures and their contexts in North America. One purpose of the course is to raise questions about the meaning of the U.S. - Canadian border for Native writers. Reading-intensive course.

*Prerequisite(s):* 1 of ENGL\*1080, ENGL\*1200, ENGL\*1410

#### ENGL\*2640 Culture, Location, Identity: Minoritized Literatures in Canada and Beyond F (3-0) [0.50]

This course will open up debates around emergent issues, perspectives, and voices in the literatures of minoritized cultures particularly within the North American context. Questions about the meanings of various borders for understanding Canadian negotiations of identity, culture, and location will remain a consistent feature of this variable content course. Reading-intensive course. (Also offered in Distance Education format.)

*Prerequisite(s):* 1 of ENGL\*1080, ENGL\*1200, ENGL\*1410



**ENGL\*2740 Children's Literature F,W (3-0) [0.50]**

This course serves as an introduction to the critical study of children's literature and culture. Focusing on selected genres of, issues in, or theoretical approaches to literature for children, this variable-content course explores shifting (and often conflicting) conceptions of childhood, in general, and of children as readers and cultural consumers. Reading-intensive course.

*Prerequisite(s):* 1 of ENGL\*1080, ENGL\*1200, ENGL\*1410

**ENGL\*2880 Women in Literature W (3-0) [0.50]**

This variable-content course will involve the study and discussion of poems, stories, novels and plays by or about women. Reading-intensive course.

*Prerequisite(s):* 1 of ENGL\*1080, ENGL\*1200, ENGL\*1410, WMST\*1000

**ENGL\*2920 Creative Writing: Fiction U (3-0) [0.50]**

An introduction to creative writing through practical experiment, discussion, and the technical examination of models. Since admission to the course depends on the approval of the instructor, students must submit examples of their work to the instructor prior to registration. This course will be offered annually in either Fall or Winter. Check with the School.

*Prerequisite(s):* 1 of ENGL\*1080, ENGL\*1200, ENGL\*1410

*Restriction(s):* Instructor consent required.

**ENGL\*2940 Creative Writing: Poetry U (3-0) [0.50]**

As for ENGL\*2920. (Note especially that students must submit examples of their work to the instructor prior to registration.) This course will be offered annually in either Fall or Winter. Check with the School.

*Prerequisite(s):* 1 of ENGL\*1080, ENGL\*1200, ENGL\*1410

*Restriction(s):* Instructor consent required.

**ENGL\*3020 Shakespearean Contexts F (3-0) [0.50]**

A study of a selection of Shakespeare's plays and poems in conjunction with a wide range of other texts. These may include, at the instructor's choice, 'source' narratives, subsequent adaptations, and plays and poems by predecessors or contemporaries, as well as other writings that shed light upon discursive contexts, performance practices, authorial and playhouse revision, issues of gender and subjectivity, and the reception of these plays by early modern audiences and readers. Reading-intensive course. (Offered in even-numbered years.)

*Prerequisite(s):* 1.00 credits in English or (THST\*2010, THST\*2120)

**ENGL\*3040 U.S. Latina/o Literature F (3-0) [0.50]**

This course focuses on an English-language literature of a particular Latina/o community (e.g. Chicana/os, Cuban Americans, Puerto Ricans) in the United States. Students will be introduced to theoretical approaches and a wide range of genres, including narrative fiction, autobiography, literary journalism, and poetry. Reading-intensive course. (Offered in even-numbered years.)

*Prerequisite(s):* (1 of THST\*1040, ENGL\*1080, ENGL\*1200), ENGL\*2040

**ENGL\*3080 History of the English Language U (3-0) [0.50]**

This course introduces the key historical developments of the English language and the primary tools for the study of language. Topics to be discussed may include: the origins of and precursors to the English language; the phonology, lexicon, and grammar of English; the persistence of language change; the historical factors that affect language change; the origins and implications of language variety; the formation of prestige dialects; and the current state of the English language in Canada and the world. Reading-intensive course.

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3120 Shakespearean Receptions F (3-0) [0.50]**

The course will examine a selection of Shakespeare's plays and poems in the light of contemporary reassessments of his place in the canon. For purposes of comparison, plays by contemporaries of Shakespeare may also be studied along with adaptations of Shakespeare chosen from a number of different historical contexts. Close readings of these texts will be organized around such topics as Shakespearean adaptations, constructions of gender and subjectivity, Shakespeare and canon-formation, Shakespeare and critical theory, the politics of Shakespearean interpretation, Shakespeare in contemporary media culture, and changing performance practices. Reading-intensive course. (Offered in odd-numbered years.)

*Prerequisite(s):* 1.00 credits in English or (THST\*2010, THST\*2120)

**ENGL\*3170 Elizabethan Literary Culture: Chastity and Power W (3-0) [0.50]**

This course examines the literary culture associated with Elizabeth I. Issues, including gender and sexuality, power, and religion, will be explored through a wide range of sixteenth- and early-seventeenth century poems (these will be chosen from such writers as Skelton, Wyatt, Surrey, Mary Stuart, the Sidneys, Spenser, Marlowe, Shakespeare, Raleigh, Aemilia Lanyer, Mary Wroth, Elizabeth I, Jonson, Donne, and Herbert). Reading-intensive course. (Offered in odd-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3190 Poetics and Politics in Early Modern England F (3-0) [0.50]**

This course examines the intimate connections between poetics and politics in Elizabethan, Jacobean, and Civil War and Commonwealth literature. The texts to be studied may include plays and poems, as well as essays, political, historical, and theological writings, and works of prose fiction. Close readings of these texts will focus on such issues as kingship, transgression, rhetoric, religion, rights, and the relation between political subjection and literary subjectivity; the literary contributions will be studied in the light of a range of different approaches. Reading-intensive course. (Offered in odd-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3220 Representing Britain: 18th- & 19th- Century Literature F (3-0) [0.50]**

This course explores selected topics in the interrelation of literature and politics from the late seventeenth to the nineteenth century in Britain. Areas of focus may include: the literature of civil war, constitutionalism and revolution; satire and society; writings emerging from suffrage reform and agitation, the colonization of Ireland, the construction of political subjectivity, political paranoia, conspiracy and sedition. Reading-intensive course. (Offered in odd-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3260 Writing Gender & Family: 18th- and 19th- Century Literature W (3-0) [0.50]**

This course will explore texts which engage with such matters as the shifting constructions of the family, changing sexual practices, ideals of femininity and masculinity, and the significance of the separation of spheres in eighteenth- and nineteenth-century writing. Focal points may include: the role of desire in narrative; literary representations of gender and economics, of gender and medicine, and of pivotal figures such as the prostitute, the governess, the rake, or the gentleman. Reading-intensive course. (Offered in odd-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3280 Old English Literature U (3-0) [0.50]**

This course will focus on the language, literature, and culture of Anglo-Saxon England (7th to 11th centuries). In addition to acquiring the basics of Old English and engaging in translation exercises with passages from Anglo-Saxon texts, students will read a selection of texts in modern English translation; these may include Beowulf, "The Battle of Maldon", elegies such as "The Seafarer", riddling poems and religious poems. (Offered in alternate years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3300 Restoration to Romanticism: Forging the Nation F (3-0) [0.50]**

Drawing upon a range of literary texts from a variety of genres, this course will explore the politics of language and style in a series of cultural debates that shaped British national character from the late seventeenth to the late eighteenth centuries. Selected topics may include: literary representations of religious establishment and dissent; the division of power; the question of minority cultures; revolution and reaction; the problem of economic stability. Reading-intensive course. (Offered in even-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3320 Romanticism to Victorianism: Culture and Conformity F (3-0) [0.50]**

This course explores the key texts in various genres of British cultural debates of the late eighteenth to the late nineteenth century. Focal points may include: literary representations of family and society; science and narrative; Britain's "others"; class and conflict; protest and power; the roots of modernism; European influences. Reading-intensive course. (Offered in odd-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3340 British Imperial Culture F (3-0) [0.50]**

This multi-genre course introduces students to the literature of British imperialism in the eighteenth and nineteenth centuries. The course will consider the changing relationship between nation, empire, and colony by examining literary representations of such topics as: orientalism; travel writing; the construction of race; the representation of trade; the popular literature of empire; children's literature; the question of the other. Reading-intensive course. (Offered in even-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3360 Scottish Literary Cultures F (3-0) [0.50]**

This course explores selected issues and ideas within this national literature, from the sixteenth to the early twentieth centuries, but with a primary focus on literature of the eighteenth and nineteenth centuries. Special attention is given to issues relating to nationhood, identity, religion, colonialism, gender, and class in relation to selected examples from literary texts and folktales. Reading-intensive course. (Offered in even-numbered years.) (Also offered in Distance Education format.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3380 Studies in the History of Literary Production W (3-0) [0.50]**

This course will examine a range of issues arising from the materiality of book production and circulation. Topics may include serialization; mass production and circulation; patronage; reviewing; circulating libraries; licensing; censorship; children's literature; periodicals; gift books; letters; and other aspects of publishing and the public sphere. Reading-intensive course. (Offered in odd-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3420 20th- & 21st-Century Drama W (3-0) [0.50]**

This course offers a selective study of 20<sup>th</sup>- and/or 21<sup>st</sup>-century play-scripts written in English. Students are advised to consult the web-descriptions for the particular focus of the course's offering. (Offered in even-numbered years.)

*Prerequisite(s):* 1.00 credits in English or (THST\*2010, THST\*2120)

**ENGL\*3460 Literature in London U (2-3) [0.50]**

A study of British literature in its social and historical context. Reading of particular works will be supplemented by visits to sites of literary interest, the use of special library and museum collections, and attendance at public lectures and performances. For London Semester students only.

*Prerequisite(s):* Admission to the London Semester.

**ENGL\*3470 Twentieth-Century British Literature I W (3-0) [0.50]**

This multigenre course explores aesthetic and socio-cultural movements (including modernism) in British literature from the turn of the century to mid-century. Reading-intensive course. (Offered in odd-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3480 Twentieth-Century British Literature II F (3-0) [0.50]**

This multigenre course explores aesthetic and socio-cultural movements (including postmodernism) in British literature from mid-century to the present. Reading-intensive course. (Offered in odd-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3540 Writing the United States W (3-0) [0.50]**

This multigenre course explores the relationship between literary production and political power from the emergence of U.S. culture through the long nineteenth century. Areas of focus may include national fantasy; the literatures of war, imperial expansion, captivity, and genocide; narratives of race and immigration; the cult of domesticity; and the rise of mass culture. Reading-intensive course. (Offered in even-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3550 Modern United States Literatures W (3-0) [0.50]**

This multigenre course explores powerful examples of modern United States literatures, from about the First World War to the present. The selection is wide, including both traditional and experimental forms; female and male writers from various ethnic and racial groups; and a range of cultural issues. Reading-intensive course. (Offered in odd-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3560 Medieval Literature W (3-0) [0.50]**

This course will introduce students to a range of medieval texts written in English and other languages and will explore the contexts of their composition and transmission. The texts to be studied may include histories, lais, lyrics, sagas, saints' lives, romances, miracle stories, fabliaux, play cycles, and others. Reading-intensive course. (Offered in even-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3570 Chaucer in Context F (3-0) [0.50]**

This course will introduce students to significant aspects of Chaucer's writing read in the context of works by Chaucer's precursors and near contemporaries. Reading-intensive course. (Offered in even-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3630 Writing Canada: Forging the Nation W (3-0) [0.50]**

This multigenre course focuses on Canadian literature to World War One, examining cultural contestation in the Canadian settler colony among the Canadian, U.S., British, and indigenous peoples. Topics may include the rise of nationalist discourse, race and nation, landscape and the sublime, gothic, sentimental, and historical fiction, children's literature, slavery and resistance narratives, travel and captivity narratives. Reading-intensive course. (Offered in odd-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3670 Twentieth-Century Canadian Literature and Criticism F (3-0) [0.50]**

This multigenre course examines formations of, and resistances to, ideas of national consciousness and cultural identity in Canadian literature and criticism in English from the beginnings of the twentieth century to the 1960s. Reading-intensive course. (Offered in even-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3680 20th- & 21st-Century Canadian Literature and Criticism F (3-0) [0.50]**

This course examines Canadian literature and criticism in English, since the 1960s, in relation to a variety of social, cultural, and historical contexts. Reading-intensive course. (Offered in odd-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3690 History of Literary Criticism F (3-0) [0.50]**

This course introduces students to the major critics and texts formative in the development of an English critical tradition. The study will begin with Plato and Aristotle, and proceed from the Renaissance through to modernist critical theory. (Offered in odd-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3750 Studies in Postcolonial Literatures W (3-0) [0.50]**

This course is a concentrated study in a major sub-area of postcolonial literature. Specific topics will vary each year, but may involve focus on a particular genre or region such as Africa, Australia, Canada, the Caribbean, India, and the Pacific. Reading-intensive course. (Offered in even-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3760 Atlantic and Mediterranean Worlds W (3-0) [0.50]**

A variable content course aimed at considering the intercultural effects which emerge from transnational, colonial, imperial, and/or diasporic relations, through literatures in English addressing the Atlantic, the Mediterranean, and contiguous lands. Texts will be selected from among the rich array of poetry, fiction, memoirs, letters, travel accounts, period histories and ethnographies, autobiographies and folkloric records that formed the literary culture of this period. Attention may be paid to diverse forms of oral and written expression, linguistic changes, the Creole continuum, the evolution of national and racial stereotypes, and religious syncretism. Reading-intensive course. (Offered in even-numbered years.)

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3860 Topics in Literary and Cultural Studies U (3-0) [0.50]**

These variable-content courses provide opportunities for topics in cross-period studies, inter- and transdisciplinary studies and cultural studies, among others that are not available in regular offerings. Consult the School for specific offerings in a given semester. Reading-intensive course.

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3870 Topics in Literary and Cultural Studies U (3-0) [0.50]**

These variable-content courses provide opportunities for topics in cross-period studies, inter- and transdisciplinary studies and cultural studies, among others that are not available in regular offerings. Consult the School for specific offerings in a given semester. Reading-intensive course.

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3880 Topics in Literary and Cultural Studies U (3-0) [0.50]**

These variable-content courses provide opportunities for topics in cross-period studies, inter- and transdisciplinary studies and cultural studies, among others that are not available in regular offerings. Consult the School for specific offerings in a given semester. Reading-intensive course.

*Prerequisite(s):* 1.00 credits in English.

**ENGL\*3940 Seminar: Form, Genre, and Literary Value F,W (3-0) [0.50]**

This seminar focuses on textual conventions such as form, style, and genre as they inform the interaction between reader and text. The impact of these conventions on the processes of literary production, reception, the production of meaning, and the assessment of literary value will be explored in relation to a limited number of literary works. (Choice of focus and texts to be determined by individual instructors.) Writing- and presentation-intensive course.

*Prerequisite(s):* ENGL\*2080

**ENGL\*3960 Seminar: Literature in History F,W (3-0) [0.50]**

This course explores the processes by which specific texts or genres emerge from particular historical moments and by which we attempt to reconstruct those historically specific connections. Seminars will focus on such topics as the archive surrounding one text, problems of period and canon, or genres and historical change. (Choice of period and texts will be determined by individual instructors.) Writing- and presentation-intensive course.

*Prerequisite(s):* ENGL\*2080

**ENGL\*4240 Medieval & Early Modern Literatures U (3-0) [1.00]**

This seminar provides the opportunity for intensive study of British literature from the beginnings to 1660. Students are advised to complete a 3000-level lecture course in this subject area prior to enrolling in the 4000-level course.

*Prerequisite(s):* ENGL\*2080, (ENGL\*2120 or ENGL\*2130), (ENGL\*3940 or ENGL\*3960)

*Restriction(s):* ENGL\*4040 Restricted to students in the English major, who have completed 14.00 credits with an average of 70% in all course attempts in English.

**ENGL\*4250 18th- & 19th-C Literatures U (3-0) [1.00]**

This seminar provides the opportunity for intensive study of British literature from 1660 to 1900. Students are advised to complete a 3000-level lecture course in this subject area prior to enrolling in the 4000-level course.

*Prerequisite(s):* ENGL\*2080, (ENGL\*2120 or ENGL\*2130), (ENGL\*3940 or ENGL\*3960)

*Restriction(s):* ENGL\*4050 Restricted to students in the English major, who have completed 14.00 credits with an average of 70% in all course attempts in English.

**ENGL\*4270 United States Literatures U (3-0) [1.00]**

This seminar provides the opportunity for intensive study of United States literatures. Students are advised to complete a 3000-level lecture course in this subject area prior to enrolling in the 4000-level course.

*Prerequisite(s):* ENGL\*2080, (ENGL\*2120 or ENGL\*2130), (ENGL\*3940 or ENGL\*3960)

*Restriction(s):* ENGL\*4070 Restricted to students in the English major, who have completed 14.00 credits with an average of 70% in all course attempts in English/

**ENGL\*4280 Canadian Literatures U (3-0) [1.00]**

This seminar provides the opportunity for intensive study of Canadian literatures. Students are advised to complete a 3000-level lecture course in this subject area prior to enrolling in the 4000-level course.

*Prerequisite(s):* ENGL\*2080, (ENGL\*2120 or ENGL\*2130), (ENGL\*3940 or ENGL\*3960)

*Restriction(s):* ENGL\*4080 Restricted to students in the English major, who have completed 14.00 credits with an average of 70% in all course attempts in English.

**ENGL\*4310 Special Studies in English U (3-0) [1.00]**

A seminar designed to provide students in semesters 7 and 8 with an opportunity to pursue studies in an area or areas of language or literature not available in other courses. The course may be taught by a visiting professor or members of the school.

*Prerequisite(s):* ENGL\*2080, (ENGL\*2120 or ENGL\*2130), (ENGL\*3940 or ENGL\*3960)

*Restriction(s):* ENGL\*4100, ENGL\*4110 Restricted to students in the English major, who have completed 14.00 credits with an average of 70% in all course attempts in English.

**ENGL\*4320 Special Studies in English U (3-0) [1.00]**

This is a seminar designed to provide students with an opportunity to pursue studies in an area or areas of language or literature not available in other courses. The course may be taught by a visiting professor or members of the school.

*Prerequisite(s):* ENGL\*2080, (ENGL\*2120 or ENGL\*2130), (ENGL\*3940 or ENGL\*3960)

*Restriction(s):* ENGL\*4100, ENGL\*4110 Restricted to students in the English major, who have completed 14.00 credits with an average of 70% in all course attempts in English.

**ENGL\*4400 Postcolonial Literatures U (3-0) [1.00]**

This course provides the opportunity for intensive study of a representative selection of literature in English by writers from Africa, India, the Caribbean, Australia, and the Pacific. Students are advised to complete a 3000-level lecture course in this subject area prior to enrolling in the 4000-level course.

*Prerequisite(s):* ENGL\*2080, (ENGL\*2120 or ENGL\*2130), (ENGL\*3940 or ENGL\*3960)

*Restriction(s):* ENGL\*4200 Restricted to students in the English major, who have completed 14.00 credits with an average of 70% in all course attempts in English.

**ENGL\*4410 Modern & Contemporary Literatures U (3-0) [1.00]**

This course provides the opportunity for a study of significant works in fiction, poetry, and drama that demonstrate new approaches in form and content characteristic of 20<sup>th</sup>- and 21<sup>st</sup>-century writings in English. Students are advised to complete a 3000-level lecture course in this subject area prior to enrolling in the 4000-level course.

*Prerequisite(s):* ENGL\*2080, (ENGL\*2120 or ENGL\*2130), (ENGL\*3940 or ENGL\*3960)

*Restriction(s):* ENGL\*4210 Restricted to students in the English major, who have completed 14.00 credits with an average of 70% in all course attempts in English.

**ENGL\*4420 Women's Writings U (3-0) [1.00]**

This course provides for intensive study of issues relating to the aesthetic strategies, such as those associated with structure, imagery, and language, devised by women writers to reflect women's experience and perceptions. Students are advised to complete a 3000-level lecture course in this subject area prior to enrolling in the 4000-level course.

*Prerequisite(s):* ENGL\*2080, (ENGL\*2120 or ENGL\*2130), (ENGL\*3940 or ENGL\*3960)

*Restriction(s):* Restricted to English and Women's Studies majors; ENGL\*4210 Restricted to students in the English major, who have completed 14.00 credits with an average of 70% in all course attempts in English.

**ENGL\*4500 Non-fiction Prose U (3-0) [1.00]**

This course offers an intensive study of non-fiction prose. Topics to be explored may include the roles and contexts of public and/or private writing, the role of literary criticism in reading texts sometimes marked as non-literary, the history of non-fictional prose forms, or the formal or ideological uses of the distinctions between fact and fiction.

*Prerequisite(s):* ENGL\*2080, (ENGL\*2120 or ENGL\*2130), (ENGL\*3940 or ENGL\*3960)

*Restriction(s):* ENGL\*4300 Restricted to students in the English major, who have completed 14.00 credits with an average of 70% in all course attempts in English.

**ENGL\*4720 Creative Writing: Prose/Poetry U (3-0) [0.50]**

A development and extension of the creative writing/reading skills and techniques introduced in ENGL\*2920 and ENGL\*2940. This course will involve the generation and revision of challenging new work, sophisticated critique of the work of other students, and focused discussion of the cultural, social, and political issues in which the practice of creative writing is enmeshed. Admission to the course is normally dependent on the successful completion of ENGL\*2920 or ENGL\*2940 and, following the submission of a portfolio of new work, the approval of the instructor.

*Prerequisite(s):* ENGL\*2920 or ENGL\*2940

*Restriction(s):* Instructor consent required.

**ENGL\*4810 Directed Reading S,F,W (3-0) [0.50]**

This course is intended particularly as preparation for ENGL\*4910. The student will design a course of readings and assignments with the instructor, whose consent must first be obtained. This option is intended only for students who have performed particularly well within the honours program. Exceptional students may take ENGL\*4810 in preparation for a ENGL\*4910 creative writing project, on the approval of the instructor.

*Prerequisite(s):* ENGL\*2080, (ENGL\*2120 or ENGL\*2130), (ENGL\*3940 or ENGL\*3960)

*Restriction(s):* Instructor consent required.

**ENGL\*4880 20th- & 21st-Century Poetry U (3-0) [1.00]**

This seminar provides opportunities to study English-language modern and contemporary poetry. Students are advised to complete a 3000-level lecture course in this subject area prior to enrolling in the 4000-level course.

*Prerequisite(s):* ENGL\*2080, (ENGL\*2120 or ENGL\*2130), (ENGL\*3940 or ENGL\*3960)

*Restriction(s):* ENGL\*4680 Restricted to students in the English major, who have completed 14.00 credits with an average of 70% in all course attempts in English.

**ENGL\*4890 Contemporary Literary Theory U (3-0) [1.00]**

This course will study the major branches of contemporary literary theory. Topics covered will include structuralism, reader-oriented theory, feminist theory, new historicist and materialist critique, postcolonialist critique, and deconstruction.

*Prerequisite(s):* ENGL\*2080, (ENGL\*2120 or ENGL\*2130), (ENGL\*3940 or ENGL\*3960)

*Restriction(s):* ENGL\*4690 Restricted to students in the English major, who have completed 14.00 credits with an average of 70% in all course attempts in English.

**ENGL\*4910 Honours English Essay S,F,W (3-0) [0.50]**

A major essay (approx. 25 pages) on some subject of special interest to the student is prepared and written under the direction of a faculty member. Consent of the instructor must be obtained and the subject must be approved by the School prior to the semester in which the course is to be taken. This option is intended only for students who have performed particularly well within the honours program. Exceptional students may use ENGL\*4910 for creative writing, on the approval of the instructor.

*Prerequisite(s):* ENGL\*2080, (ENGL\*2120 or ENGL\*2130), (ENGL\*3940 or ENGL\*3960)

*Restriction(s):* Instructor consent required.

## Environmental Biology

Department of Plant Agriculture

*School of Environmental Sciences*

*Additional course listings may be found in the course descriptions for Microbiology, Plant Biology, Toxicology and Zoology.*

### ENVB\*2030 Current Issues in Forest Science F (3-0) [0.50]

This course focuses on the analysis of current issues in forest science from a variety of perspectives. Aspects of natural and managed forest dynamics, ecology and diversity are discussed. Relationships between important tree species and their preferred environments are covered, with emphasis on Canada's forests. The course also explores the role of forests in the global context.

*Prerequisite(s):* BIOL\*1040 or (2 of BIOL\*1070, BIOL\*1080, BIOL\*1090)

### ENVB\*2040 Plant Health and the Environment W (3-0) [0.50]

This is an interdisciplinary course on the nature and importance of diseases, insects and abiotic stresses on plant productivity and quality. A case history approach will be used to illustrate the biology of plant pests, the principles of pest population management, and related topics.

*Prerequisite(s):* BIOL\*1040 or (2 of BIOL\*1070, BIOL\*1080, BIOL\*1090)

### ENVB\*2100 Problem-Solving in Environmental Biology W (2-2) [0.50]

This course provides an introduction to current issues and problems in environmental biology. Methodologies of addressing environmental issues and concerns will be critically examined. Project design, information retrieval and organization, and the interpretation of statistical data will be covered. Oral and written presentations, both individual and group will be emphasized.

*Prerequisite(s):* BIOL\*1040, (CHEM\*1050 or CHEM\*1310), MATH\*1080

### ENVB\*2210 Introductory Apiculture F,W (3-0) [0.50]

This course is designed to acquaint the student with the broad field of beekeeping. It will include honey bee biology and behaviour, management for honey production, products of the hive, pests and enemies and the value of bees as pollinators of agricultural crops. (Also offered through Distance Education format.)

### ENVB\*3000 Nature Interpretation F,W (2-3) [0.50]

An exploration of communication and experiential learning theories and their application to natural history interpretation and environmental education program design. Students will develop and present interpretive materials and a program within the context of the existing nature interpretation program at The Arboretum. (Also offered through Distance Education format.)

*Prerequisite(s):* 1 of BIOL\*2060, BOT\*2050, BIOL\*3110

### ENVB\*3010 Climate Change Biology F (3-0) [0.50]

This course examines the impacts of climate change on living organisms, biological communities and ecosystems. The course focuses on what is known, and what is not known, about the ways in which the suite of changing climate variables influence biological systems.

*Prerequisite(s):* (BIOL\*1040 or BIOL\*1070), (1 of BIOL\*2060, BIOL\*3110, BOT\*2050), CHEM\*1050

### ENVB\*3030 Pesticides and the Environment W (3-0) [0.50]

This course examines the role and use of pesticides by various facets of society and the effect of these pesticides on biological activities in the environment. Preparation of a research proposal is required for the course. (Offered through Distance Education only.)

*Prerequisite(s):* [BIOL\*1040 or (2 of BIOL\*1070, BIOL\*1080, BIOL\*1090)], (CHEM\*1040 or CHEM\*2300)

### ENVB\*3040 Natural Chemicals in the Environment F (3-0) [0.50]

This course explores the roles of naturally occurring chemicals in the inter-relationships of organisms, and the historical and current uses of natural chemicals by humans for agricultural and medicinal purposes. (Offered through Distance Education only.)

*Prerequisite(s):* BIOL\*1040 or (2 of BIOL\*1070, BIOL\*1080, BIOL\*1090)

### ENVB\*3090 Insect Diversity and Biology W (3-3) [0.50]

This course is an overview of insect diversity and biology emphasizing groups of importance in conservation biology, outdoor recreation and economic entomology. Labs focus on insect identification and the development of a small insect collection.

*Prerequisite(s):* BIOL\*1040 or (2 of BIOL\*1070, BIOL\*1080, BIOL\*1090)

### ENVB\*3160 Management of Turfgrass Diseases F (2-2) [0.50]

In this course ecology of turfgrass diseases and cultural methods of management will be emphasized, in addition to field recognition and microscopic diagnosis of diseases. Advances in biological and chemical control measures and their impact on turfgrass ecosystems and surrounding environments will also be discussed.

*Prerequisite(s):* HORT\*2450

*Restriction(s):* DTM\*3200

### ENVB\*3210 Plant Pathology F (2-3) [0.50]

This course examines the nature of disease in plants, including their causal agents, etiology, biology, epidemiology, and management. Emphasis is placed on the historical and social importance of plant diseases, and on current issues in plant health. Each student is required to make a collection of 20 plant disease specimens. Students must contact the course instructor before starting their collection.

*Prerequisite(s):* BIOL\*1040 or BIOL\*1070

### ENVB\*3230 Agroforestry Systems F (2-2) [0.50]

The planned and systematic integration of trees into the agricultural landscape can potentially result in sustainable environmental, ecological, economic and social benefits. The key aspects of deriving these benefits, associated science and management considerations, application potentials at the landscape level and adoption challenges will be discussed. Common temperate and tropical agroforestry systems (e.g. intercropping of trees and crops) will be discussed. Emphasis will be given to successful research and development case studies.

*Prerequisite(s):* ENVB\*2030

### ENVB\*3250 Forest Health and Disease F (2-2) [0.50]

The impact of beneficial and pathogenic microorganisms on forest health, and the biology and management of tree diseases in natural and urban ecosystems is covered in this course. Emphasis will be placed on ecological processes, host-pathogen interactions, mutualistic associations, wood decay, and human impacts on tree health.

*Prerequisite(s):* ENVB\*2030 or BOT\*2100

### ENVB\*3270 Forest Biodiversity W (4-0) [0.50]

This course examines biodiversity in forest ecosystems at a variety of scales from genes to landscapes. Relationships between biodiversity and forest ecosystem structure, function, and stability are explored. Approaches to conserving biodiversity in managed forests are discussed and evaluated. Analysis of the relevant scientific literature and practical experience with methods of quantifying biodiversity are emphasized in the weekly seminar.

*Prerequisite(s):* ENVB\*2030, (1 of BOT\*2050, BIOL\*2060, BIOL\*3110)

### ENVB\*3280 Waterborne Disease Ecology F (3-2) [0.50]

This course examines emerging and re-emerging waterborne diseases (bacterial, protozoan, and viral) as a function of environmental change (including chemical and biological pollution and climate change). Waterborne diseases, in freshwater and marine ecosystems, will be examined from historical and contemporary issues as they relate to public and environmental health from regional, national, and international perspectives. Topics presented within the course will include current waterborne diseases of humans and aquatic fauna, detection of waterborne pathogens, microbial evolution, microbial physiology, water regulations and protection of drinking water.

*Prerequisite(s):* BIOC\*2580, (MBG\*2000 or MBG\*2040)

### ENVB\*3330 Ecosystem Processes and Applications W (3-0) [0.50]

An ecosystem approach that treats living organisms and physical elements of the environment as components of a single, integrated system is introduced in this course. The important processes that characterize ecosystems, tracing water, carbon and nutrients from their abiotic sources to their cycles through plants, animals and decomposers will be examined. Human activity is a dominant influence on these cycles and this influence is surveyed in several highly impacted ecosystems.

*Prerequisite(s):* [BIOL\*1040 or (2 of BIOL\*1070, BIOL\*1080, BIOL\*1090)], (1 of BIOL\*2060, BIOL\*3110, BOT\*2050), CHEM\*1050

### ENVB\*4020 Water Quality and Environmental Management F (3-3) [0.50]

This course will introduce the student to issues pertaining to water quality, how to assess impacts in aquatic systems, and strategies for the management of water resources. Examples and case studies will draw from agricultural, industrial and municipal sources. Topics include: historical perspectives, current issues in water pollution, methods to assess water quality, restoration and rehabilitation of impacted aquatic habitats, and risk assessment and management of water resources.

*Prerequisite(s):* BIOL\*2060 or (ENVM\*1100, ENVM\*1150)

**ENVB\*4040 Behaviour of Insects W (4-0) [0.50]**

This course investigates the behaviour of insects within an ecological and evolutionary framework. Topics range from basic behavioral principles to the complex behaviour exhibited by the social insects.

*Prerequisite(s):* 1 of BIOL\*3110, ENVB\*3090

**ENVB\*4070 Biological and Cultural Control of Plant Diseases W (3-0) [0.50]**

This course explores current concepts and approaches to managing plant pathogens and diseases in crops and natural plant communities by measures that have minimal impact on the environment. Topics include naturally-occurring biological control such as suppressive soils and induced host resistance, use of microbial agents and their modes of action, transgenic disease resistance, use of organic soil amendments and mulches to promote microbial diversity and suppress pathogens, and effects of sanitation, crop sequences, tillage, flooding, soil solarization and other cultural practices on microbial communities, including pathogens and on disease epidemics. Department of Plant Agriculture.

*Prerequisite(s):* 1 of BIOL\*3050, ENVB\*3210, MICR\*3220

**ENVB\*4100 Integrated Management of Invasive Insect Pests W (3-3) [0.50]**

This course explores the concept of integrated pest management as it applies to the mitigation of invasive insect pests associated with agricultural and forest ecosystems. (Offered in even-numbered years).

*Prerequisite(s):* 1 of CROP\*3300, CROP\*3310, ENVB\*2030, ENVB\*3090, HORT\*3230, HORT\*3280, HORT\*3350, HORT\*3510

**ENVB\*4130 Chemical Ecology: Principles & Practice W (3-0) [0.50]**

Chemicals mediate interactions between individuals of a species and between organisms and their host plants. These interactions can be manipulated and exploited to manage pest populations through the use of pheromones, allelochemicals and host plant resistance. The nature of these interactions (from behavioural to evolutionary), biological and chemical methods used in their investigation, and the application of chemical ecology to insect pest and plant disease management will be covered. (Offered in odd-numbered years.)

*Prerequisite(s):* ENVB\*3040

**ENVB\*4220 Biology of Aquatic Insects F (2-3) [0.50]**

This course is a study of the adult and immature forms of aquatic insects. Students are required to present a collection of at least 200 insect specimens identified to genus. (Offered in odd-numbered years.)

*Prerequisite(s):* ENVB\*3090

**ENVB\*4240 Biological Activity of Pesticides W (3-0) [0.50]**

A study of the fate and mode of action of pesticides, e.g., insecticides, herbicides and fungicides.

*Prerequisite(s):* 0.50 credits in biochemistry

**ENVB\*4260 Field Entomology F,W (1-6) [0.50]**

This course is taught in late April or May. Students may enroll in either the preceding Winter semester or following Fall semester. The course provides an introduction to insect sampling, observation, identification, and experimentation in field settings. Student activities are divided equally between observing, collecting and identifying specimens from more than 20 families and an experimental component involving one or more studies to test hypotheses about the ecology or behaviour of insects. There are occasional lectures and discussions to highlight particularly interesting observations of insects. Student evaluation is based on the student's insect collection and associated logbook, a written paper describing their experiment, contributions to class discussions and activities, and peer evaluation. The field site is generally in the USA or South America. Course fees cover costs of room, board, supplies, and transportation to the field site(s). This course must be recorded as part of the student's Fall or Winter course selection and tuition and compulsory fees will be calculated accordingly. Detailed information is available from the Office of the Director - School of Environmental Sciences.

*Prerequisite(s):* ENVB\*3090 or ENVB\*4040

*Restriction(s):* Instructor consent required.

**ENVB\*4270 Insect Biosystematics W (2-3) [0.50]**

A study of the lesser known groups of native insects and an introduction to taxonomic procedure and the principles of insect systematics. Students are required to assemble their own insect collections prior to registering in this course. The laboratory portion of the course will focus on identification of student insect collections.

*Prerequisite(s):* ENVB\*3090

**ENVB\*4550 Toxicological Risk Characterization W (3-0) [0.50]**

This is a biologically based, advanced course that will give students working knowledge of current processes and techniques for toxicological risk characterization. The course material will cover the topics of problem definition, effect characterization, exposure characterization, risk assessment, and risk management decision making. (Also listed as TOX\*4550.)

*Prerequisite(s):* ENVB\*3030, TOX\*2000

*Equate(s):* TOX\*4550

**ENVB\*4780 Forest Ecology F (3-3) [0.50]**

Principles of forest ecology with emphasis on the ecological principles needed for sound forest management. Biotic and abiotic components of forest ecosystems will be discussed in the context of energy flow, nutrient cycling, forest succession and appropriate silvicultural systems.

*Prerequisite(s):* ENVB\*2030, (1 of BOT\*2050, BIOL\*2060, BIOL\*3110)

## Environmental Management

### School of Environmental Sciences

#### ENVM\*1000 Introductory Environmental Science F (3-2) [0.50]

Students will explore a broad range of environmental issues facing society today with particular focus on Canadian and local agriculture. This course will provide an understanding of the living and non-living factors as well as social and economic constraints involved in correctly identifying and resolving environmental issues. The interdisciplinary approach of environmental science is reinforced with real life case studies designed to challenge students to critically assess alternatives and/or possible solutions.

*Restriction(s):* Registered in B.B.R.M.

*Location(s):* Ridgetown

#### ENVM\*1020 Introduction to Environmental Microbiology W (2-3) [0.50]

This course will introduce the students to Environmental Microbiology. Topics of discussion will include water and wastewater systems, soils and sediments; as well as the importance of bacteria in disease, nutrition, food and food processing. Students will be introduced to various methods of environmental monitoring such as sampling and testing of public drinking water, how to monitor for cleanliness in food processing facilities as well as water ways used for recreational purposes. Student immunization records are required. See course instructor.

*Restriction(s):* Registered in B.B.R.M. Environmental Management. Instructor consent required.

*Location(s):* Ridgetown

#### ENVM\*1050 Surveying and GIS F (3-2) [0.50]

This course covers the basic principals of surveying, map reading and production. The student will learn how to read maps, take precise measurements, use basic survey instruments and create maps and site plans. The student will learn the basics of Geographic Information System (GIS) and the Global Positioning System (GPS) and use these tools to organize and store spatial data. The students will use Remote Sensing techniques for a range of applications.

*Restriction(s):* Registered in B.B.R.M.

*Location(s):* Ridgetown

#### ENVM\*1070 Nutrient Management W (3-2) [0.50]

This course will examine the best management practices associated with nutrient management on farms. Emphasis will be placed on the components and development of a nutrient management plan and the safe utilization of various nutrient sources (fertilizers, manures and biosolids) in agricultural production systems.

*Restriction(s):* Registered in B.B.R.M.

*Location(s):* Ridgetown

#### ENVM\*1090 Occupational Health and Safety F (3-2) [0.50]

This course explores issues and legal requirements involved in promoting safe communities and work places. Technical, legislative, political, ethical and personal issues are explored. Students will examine and evaluate topics including the Workplace Hazardous Material Information System, Material Safety Data sheets, and the responsibilities of Joint Health and Safety Committees and confined space entry. Hazards to human health resulting from exposure to a variety of physical and chemical hazards found in the workplace will be examined.

*Restriction(s):* Registered in B.B.R.M.

*Location(s):* Ridgetown, Kemptville

#### ENVM\*1100 Ecology F (3-2) [0.50]

This course is an introduction to the science of ecology - the study of interactions between organisms and their environments. Major topics include adaptation, populations, communities, biodiversity, ecosystems and competition. Students will analyze the effects of climate change and human activities on ecological processes. A detailed analysis of case studies of several environmental problems will be carried out, using ecological principles.

*Restriction(s):* Registered in B.B.R.M.

*Location(s):* Ridgetown

#### ENVM\*1120 Environmental Monitoring W (2-3) [0.50]

This course will introduce the Environmental Management students to various methods used to measure environment impact. Students will achieve a summary understanding of the various government and municipal agency threshold limits and guidelines of the studied environmental parameters such as water quality, vegetation, terrestrial and social impact analysis. Student immunization records required for this course. See course instructor.

*Restriction(s):* Registered in B.B.R.M. Instructor consent required.

*Location(s):* Ridgetown

#### ENVM\*1130 Introduction to Renewable Energy F (3-2) [0.50]

Students will develop a working knowledge of the major renewable sources of energy under development today. The focus will be Ontario, although examples from around the world will be discussed. Students will compare "green" technologies to traditional energy sources in order to understand the technological, economic and social issues surrounding the growth of each of the renewable energy types.

*Restriction(s):* Registered in B.B.R.M:Environmental Management major.

*Location(s):* Ridgetown

#### ENVM\*1150 Water Resource Management W (3-2) [0.50]

This course will focus on the significance of the various elements of the hydrologic cycle (e.g. precipitation, runoff, infiltration, groundwater recharge and discharge, etc.). The student will examine common water quality standards and the most significant quality problems including causes and pathways that contaminants follow to reach surface water and groundwater, with special focus on agricultural impacts. The course will introduce water and wastewater treatment systems.

*Restriction(s):* Registered in B.B.R.M.

*Location(s):* Ridgetown

#### ENVM\*2020 Environmental Law F (3-2) [0.50]

This course will introduce the student to the Canadian legal process. Topics will include how new laws and regulations are developed, drafted, passed and administered in Ontario and across Canada. The course will focus on environmental legislation at both the federal and provincial levels of government.

*Restriction(s):* Registered in B.B.R.M.

*Location(s):* Ridgetown

#### ENVM\*2050 Agriculture and Environmental Stewardship F (3-2) [0.50]

This course examines the impact and role of farming in the agro-ecosystem. Lectures and case studies will be used to explore potential pathways of soil degradation and environmental contamination from agriculture, site assessment of environmental risk associated with specific farm operations and the utilization of best management practices for the conservation of soil, water and other natural resources.

*Prerequisite(s):* SOIL\*2010

*Restriction(s):* Registered in B.B.R.M.

*Location(s):* Ridgetown

#### ENVM\*2060 Sewage and Wastewater Treatment F (2-3) [0.50]

This course provides the student with the basic design concepts and operational techniques of industrial and municipal wastewater treatment systems. Treatment processes, optimization and testing methodologies as well as auditing and analytical/operational calculations, legal requirements and operator responsibilities will be addressed.

*Prerequisite(s):* ENVM\*1120

*Restriction(s):* Registered in B.B.R.M.

*Location(s):* Ridgetown

#### ENVM\*2070 Water Treatment F (2-3) [0.50]

This course provides the student with the basic design concepts and operational techniques of industrial and municipal water treatment systems. Treatment processes for ground and surface water, optimization and testing methodologies as well as auditing and analytical/operational calculations, legal requirements of water taking and operator responsibilities will be addressed.

*Prerequisite(s):* ENVM\*1020 is strongly recommended, ENVM\*1120

*Restriction(s):* Registered in B.B.R.M. Environmental Management

*Location(s):* Ridgetown

#### ENVM\*2080 Industrial Waste Management W (3-2) [0.50]

The course is designed to give students a thorough understanding of the field of industrial waste management. From a regulatory perspective topics include Ontario non hazardous waste Statutes and Regulations. The course explores the various sub-sets within the field of industrial waste management. Topic areas include municipal and industrial recycling and waste minimization programs with emphasis on the development and design of programs that collect wastes generated in the Industrial, Commercial and Institutional sectors. Waste minimization, ISO 14001 and Environmental Management Systems methodologies are explored.

*Prerequisite(s):* 3.00 credits.

*Restriction(s):* Registered in B.B.R.M.

*Location(s):* Ridgetown

**ENVM\*2090 Spills Response Planning W (3-2) [0.50]**

This course explores both the moral and ethical questions pertaining to the management and abatement of spills reporting, spills remediation and prevention strategies. The course will introduce students to the field of spill response and spill response planning. The current Province of Ontario Spills Legislation will provide the legislative framework for this course. Students will examine the development of industrial contingency and emergency planning.

*Prerequisite(s):* 3.00 credits

*Restriction(s):* Registered in B.B.R.M.

*Location(s):* Ridgetown

**ENVM\*2500 Integrated Project (Environmental) W (2-3) [0.50]**

Students will integrate the skills and knowledge gained in earlier courses in analysing the environmental systems of an industry, municipality, agri-business and/or agricultural enterprise. The students will work in teams to complete a detailed Environmental Management System and create environmental policies and action plans.

*Prerequisite(s):* Minimum of 5.00 credits in the B.B.R.M. program.

*Restriction(s):* Registered in B.B.R.M.

*Location(s):* Ridgetown



## Environmental Sciences

### School of Environmental Sciences

Department of Food, Agricultural and Resource Economics

*The program in Environmental Sciences is interdisciplinary, involving courses from several different departments. See the B.Sc.(Env.) program information in Section X--Undergraduate Degree Programs.*

#### ENVS\*1020 Introduction to Environmental Sciences F (3-2) [0.50]

Students will be shown how to recruit their skills as scientists to identify, characterize, and analyze environmental problems. The course will emphasize the history of environmental science by focusing on how problems were first identified and then solved at different stages of human understanding of biology, chemistry, physics, economics, law, and religion. Students will be taught to communicate their understanding of environmental science to specialized audiences and to the public.

*Restriction(s):* Registration in the B.Sc. (Env.) program.

#### ENVS\*2150 Terrestrial Systems F (3-2) [0.50]

In this course students will be taught how to apply quantitative methods to the analysis of terrestrial systems of the earth from many simultaneous perspectives. The material will include the physical, chemical and biological components of landforms and how they interact with humans. The economic, social and policy implications of humans interacting with terrestrial systems will also be emphasized. The history of the analysis of terrestrial systems will be systematically included in the material.

*Prerequisite(s):* ENVS\*1020, GEOG\*1300

*Restriction(s):* Registration in the B.Sc. (Env.) program will be restricted to only those students who have declared a major.

#### ENVS\*3100 Internship/Externship in Environmental Sciences S,F,W (0-6) [0.50]

This is a student initiated experiential learning opportunity to be undertaken either on or off campus, and developed in consultation with the Director of the School of Environmental Sciences. Details of the proposed activities will be outlined in a learning contract initiated by the student and agreed by the Director and an appointed project advisor prior to the commencement of the work experience. The supervisor will also provide a description of the project and/or the work experience. This course is intended for experiential learning which does not fit under an academic independent study and which is not part of the co-op work term. A pass/fail grade will be assigned upon completion of the course.

*Prerequisite(s):* 12.50 credits including ENVS\*1020

*Restriction(s):* Director consent required.

#### ENVS\*3150 Aquatic Systems W (3-2) [0.50]

In this course students will be taught how to apply quantitative methods to the analysis of aquatic systems of the earth from many simultaneous perspectives. The material will include the physical, chemical and biological components of the various liquid surficial structures and processes and also how they interact with humans. The economic, social and policy implications of humans interacting with aquatic systems will also be emphasized. The history of the analysis of aquatic systems will be systematically included in the material.

*Prerequisite(s):* 11.00 credits including ENVS\*1020, ENVS\*2150, CHEM\*1050

*Restriction(s):* Registration in the B.Sc. (Env.) program.

#### ENVS\*3410 Independent Research I S,F,W (0-6) [0.50]

In this course the student will undertake an independent research project of a practical or theoretical nature that relates to environmental sciences and is conducted under the supervision of a faculty member. This course introduces third year students to independent research. Projects may be designed to be completed in a single semester, or they may be designed to be completed over two semesters, in conjunction with ENVS\*3420. Students must make arrangements with both a faculty supervisor and the course coordinator at least one semester in advance. A school registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the course is taken.

*Prerequisite(s):* Must have completed a minimum of 10.00 credits. Minimum cumulative average of 70%.

*Restriction(s):* ENVS\*3430. Instructor consent required. Restricted to students in BBRM:EM, BSES, BSAG or BSCH.

#### ENVS\*3420 Independent Research II S,F,W (0-6) [0.50]

In this course the student will undertake an independent research project of a practical or theoretical nature that relates to environmental sciences and is conducted under the supervision of a faculty member. This course introduces third year students to independent research. Projects may be a continuation of research conducted in ENVS\*3410, or they may be on a separate research topic. Students must make arrangements with both a faculty supervisor and the course coordinator at least one semester in advance. A school registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the course is taken.

*Prerequisite(s):* ENVS\*3410. Must have completed a minimum of 10.00 credits. Minimum cumulative average of 70%.

*Restriction(s):* ENVS\*3430. Instructor consent required. Registration in BBRM:EM, BSES, BSAG or BSCH.

#### ENVS\*3430 Independent Research S,F,W (0-12) [1.00]

In this course the student will undertake an independent research project of a practical or theoretical nature that relates to environmental sciences and is conducted under the supervision of a faculty member. This course introduces third year students to independent research. This project course is designed to allow students to complete a longer, more in-depth project within a single semester. Students must make arrangements with both a faculty supervisor and the course coordinator at least one semester in advance. A school registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the course is taken.

*Prerequisite(s):* Must have completed a minimum of 10.00 credits. Minimum cumulative average of 70%.

*Restriction(s):* ENVS\*3410, ENVS\*3420. Instructor consent required. Registration in BBRM:EM, BSES, BSAG or BSCH.

#### ENVS\*4011 Project in Environmental Sciences F (0-1) [0.00]

First part of the two-semester course ENVS\*4011/2. Refer to ENVS\*4011/2 for course description.

*Prerequisite(s):* Registration in semester 6 or 7 of the B.Sc.(Env.) degree program.

#### ENVS\*4011/2 Project in Environmental Sciences F-W [0.50]

The course permits the student the opportunity to integrate both the skills and knowledge acquired in earlier courses through application to current environmental problems and issues. Group research problems and exposure to critical environmental policy issues will form the core elements of the course. Students must be registered and attend preliminary organizational meetings scheduled in the Fall semester. This is a two-semester course offered over consecutive semesters. When you select it you must select ENVS\*4011 in the Fall semester and ENVS\*4012 in the Winter semester. A grade will not be assigned to ENVS\*4011 until ENVS\*4012 is completed.

*Prerequisite(s):* Registration in semester 6 or 7 of the B.Sc.(Env.) degree program.

#### ENVS\*4012 Project in Environmental Sciences W (0-3) [0.50]

Second part of the two-semester course ENVS\*4011/2. Refer to ENVS\*4011/2 for course description.

*Prerequisite(s):* ENVS\*4011

#### ENVS\*4300 Environmental Law & Regulation F (5-0) [0.50]

In this course, students will be asked to recruit their expertise in all of the basic and applied sciences to the task of understanding, participating in, and modifying where necessary the economic and legal systems of the world to deal with human exploitation of the earth. The course will include a discussion of the history of the success and failure of different economic and legal models and their impact on the sustainability of the earth's resources. Department of Food, Agricultural and Resource Economics.

*Prerequisite(s):* 14.00 credits

*Restriction(s):* Registration in the B.Sc. (Env.) program.

#### ENVS\*4410 Advanced Independent Research I S,F,W (0-12) [1.00]

In this course the student will undertake an independent research project of a practical or theoretical nature that relates to environmental sciences and is conducted under the supervision of a faculty member. This course is designed to provide a research intensive experience. The greater credit weighting allows the student to explore their research topic in greater depth. Projects may be designed to be completed in a single semester, or they may be designed to be completed over two semesters, in conjunction with ENVS\*4420. Students must make arrangements with both a faculty supervisor and the course coordinator at least one semester in advance. A school registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the course is taken.

*Prerequisite(s):* (ENVS\*3410, ENVS\*3420) or ENVS\*3430. Must have completed a minimum of 15.00 credits. Minimum cumulative average of 70%.

*Restriction(s):* ENVS\*4430. Instructor consent required. Registration in BSES, BSAG, BSCH or BBRM.

**ENVS\*4420 Advanced Independent Research II S,F,W (0-12) [1.00]**

In this course the student will undertake an independent research project of a practical or theoretical nature that relates to environmental sciences and is conducted under the supervision of a faculty member. This course is designed to provide a research intensive experience. The greater credit weighting allows the student to explore their research topic in greater depth. This course may be used to extend the research completed in ENVS\*4410, or it may be used to gain experience in a different research area. Students must make arrangements with both a faculty supervisor and the course coordinator at least one semester in advance. A school registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the course is taken.

*Prerequisite(s):* ENVS\*4410. Must have completed a minimum of 15.00 credits. Minimum cumulative average of 70%.

*Restriction(s):* ENVS\*4430. Instructor consent required. Registration in BSES, BSAG, BSCH or BBRM.

**ENVS\*4430 Advanced Independent Research S,F,W (0-24) [2.00]**

In this course the student will undertake an independent research project of a practical or theoretical nature that relates to environmental sciences and is conducted under the supervision of a faculty member. This course is designed to provide a research intensive experience that is completed in a single semester. Students must make arrangements with both a faculty supervisor and the course coordinator at least one semester in advance. A school registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the course is taken.

*Prerequisite(s):* (ENVS\*3410, ENVS\*3420) or ENVS\*3430. Must have completed a minimum of 15.00 credits. Minimum cumulative average of 70%.

*Restriction(s):* ENVS\*4410, ENVS\*4420. Instructor consent required. Registration in BSES, BSAG, BSCH or BBRM.

## Equine

*Ontario Agricultural College, Department of Poultry Sciences*

### EQN\*1020 Equine Management I F (1-2) [0.00]

This course provides hands-on learning in essential horse care and handling techniques. The emphasis is on daily and routine care of the horse. Safety is stressed throughout. Students may expect early morning and some weekend assignments. Depth of study is not meant to be exhaustive but rather to cultivate absolute proficiency in handling skills.

*Restriction(s):* Registration in B.B.R.M. Equine Management

*Location(s):* Kemptville

### EQN\*1030 Equine Management II W (1-2) [0.00]

This course provides hands-on learning in essential horse care and handling techniques. Safety is stressed throughout. Students may expect early morning and some weekend assignments. Depth of study is not meant to be exhaustive but rather to cultivate absolute proficiency in handling skills.

*Prerequisite(s):* EQN\*1020

*Restriction(s):* Registration in B.B.R.M. Equine Management

*Location(s):* Kemptville

### EQN\*1050 Equine Facility Management and Design W (3-2) [0.50]

This course presents aspects of the building, renovating and management of equine facilities including site planning and engineering aspects of construction. Design of facilities, including unique features, are discussed in relation to management. Special consideration is given to environmental control, waste management and environmental stewardship.

*Equate(s):* EQN\*1040

*Restriction(s):* Registration in B.B.R.M. Equine Management

*Location(s):* Kemptville

### EQN\*1060 Equine Event Management I F (1-3) [0.50]

This course will introduce skills required to organize equine events, such as horse shows and clinics. Major topics include event planning, and managing event staff and volunteers. Required activities outside of regularly scheduled class hours will be assigned. Students will assist in the planning and staging of Equestrian Centre activities.

*Restriction(s):* Registration in B.B.R.M. Equine Management

*Location(s):* Kemptville

### EQN\*1070 Equine Event Management II W (1-3) [0.50]

This course will further develop the skills required to organize equine events, such as horse shows and clinics. Major topics include regional impact, marketing and budgeting. Required activities outside of regularly scheduled class hours will be assigned. Students will assist in the planning and staging of Equestrian Centre activities.

*Prerequisite(s):* EQN\*1060

*Restriction(s):* Registration in B.B.R.M. Equine Management

*Location(s):* Kemptville

### EQN\*1100 Introduction to Equine Industry Trends and Issues F (3-0) [0.50]

This course introduces students to selected current global, national and regional issues in the horse industry. A balanced examination of the various commercial uses of horses, including PMU farming and the horsemeat trade, will challenge students to evaluate the current state of the industry.

*Restriction(s):* Registration in B.B.R.M. Equine Management

*Location(s):* Kemptville

### EQN\*2020 Stable Management F (2-2) [0.50]

This two-faceted course offers students a first-hand opportunity to manage the daily operations of an equine facility and to act in the capacity of a teaching assistant. Students oversee the diploma courses in Stable Management and Stable Duty through supervising barn personnel, dealing with time and financial constraints, managing efficient productivity, teaching horse care skills, and professionalism in the workplace.

*Prerequisite(s):* EQN\*1030, ENVN\*1090

*Restriction(s):* Registration in B.B.R.M. Equine Management

*Location(s):* Kemptville

### EQN\*2040 Equine Anatomy and Physiology F (3-3) [0.50]

This course examines the gross anatomy and physiology of the horse. All the major body organs will be studied in relation to their function in the equine. Comparative analysis will be made to other domestic farm animals.

*Prerequisite(s):* BIOL\*1040

*Restriction(s):* Registration in B.B.R.M. Equine Management

*Location(s):* Kemptville

### EQN\*2050 Introduction to Equine Nutrition W (3-3) [0.50]

This course introduces fundamental concepts of nutrition from a biochemical perspective. The biological roles of carbohydrates, lipids and proteins are studied, as well as the role of metabolic pathways in maintaining equine health at the cellular, organ, and whole body levels. Diagnosis, management, and prevention of equine nutritional diseases are discussed.

*Prerequisite(s):* BIOL\*1040

*Restriction(s):* Registration in B.B.R.M. Equine Management

*Location(s):* Kemptville

### EQN\*2200 Equine Industry Trends and Issues I W (3-0) [0.50]

This course discusses selected current global, national and regional issues in the horse industry. Analysis of strengths, weaknesses, opportunities and threats are applied to controversial issues such as industry certification and transportation legislation and enforcement.

*Prerequisite(s):* EQN\*1100

*Restriction(s):* Registration in B.B.R.M. Equine Management

*Location(s):* Kemptville

### EQN\*2500 Equine Field Course F (0-4) [0.50]

In this 10-day field course, students will tour a selected area of North America in August, visiting premier equine educational and industry locations managed by elite professionals. Students are exposed to a broad, high caliber learning experience from a variety of industry operations, providing a catalyst for future courses in the BBRM degree program. An additional fee will be assessed per student to cover the cost of transportation and accommodation. This course must be recorded as part of your Fall course selection and tuition and compulsory fees will be calculated accordingly. Contact course instructor during the preceding March course selection period.

*Prerequisite(s):* EQN\*1050

*Restriction(s):* Registration in B.B.R.M. Equine Management. Instructor consent required.

*Location(s):* Kemptville

### EQN\*3050 Equine Exercise Physiology W (3-0) [0.50]

This course considers the conversion of absorbed nutrients into metabolic fuels and the use of these substrates for work and heat production in horses. This knowledge is used as a basis for the understanding of the training and performance of horses used for competitive purposes.

*Prerequisite(s):* ANSC\*3080 or (EQN\*2040, EQN\*2050)

*Location(s):* Guelph

### EQN\*4020 Feeding the Performance Horse W (3-0) [0.50]

This course focuses on the nutrition of horses at peak levels of performance or endurance. The use of real-world, case-study scenarios allows for the evaluation of practical feeding programs across a range of equine performance situations.

*Prerequisite(s):* EQN\*3050 or NUTR\*3210

*Location(s):* Guelph

### EQN\*4400 Equine Industry Trends and Issues II W (3-0) [0.50]

This seminar course integrates discussion on selected current global, national and regional issues in the equine industry, building upon knowledge gained in earlier courses. Current issues in the equine industry will be examined through debate and discussion.

*Prerequisite(s):* 16.00 credits including EQN\*2200

*Restriction(s):* Registration in B.B.R.M. Equine Management

*Location(s):* Guelph

## European Studies

### School of Languages and Literatures

#### **EURO\*1050 The Emergence of a United Europe W (3-0) [0.50]**

This interdisciplinary course will provide students with an understanding of the events and processes resulting in economic integration in Europe after 1945. Economic, historical and political aspects will be emphasized.

#### **EURO\*1200 European Culture from the Mid 18th to the Mid 19th Century F (4-0) [0.50]**

This course explores major trends in European Culture in the context of political and social events. Focus will be on major developments in politics (e.g. the French Revolution, the birth of nationalism), philosophy (e.g. enlightenment, idealism), arts and letters (e.g. classicism, romanticism).

*Restriction(s):* EURO\*2000

#### **EURO\*2200 European Culture from the Mid 19th Century to the 1920's F (3-0) [0.50]**

This course explores major trends in European culture in the context of political and social events. Topics studied include major political events and their significance for culture (e.g. bourgeois liberalism, revolts in the mid 19th century, World War I and its aftermath), thinkers who have shaped the 20th century (e.g. Nietzsche, Unamuno, Freud), avant-garde movement and innovation in the arts and letters (e.g. impressionism, futurism, expressionism, surrealism).

*Prerequisite(s):* EURO\*1200 is recommended

*Restriction(s):* EURO\*1020

#### **EURO\*2300 European Culture since 1920 W (3-0) [0.50]**

This course explores major trends in European culture in the context of political and social events. The focus will be on political events and their significance for culture (e.g. fascism, World War II and the Holocaust and their effects in the second half of the 20th century, the political reorganization of Europe, protest movements), new trends in thought (e.g. existentialism, structuralism, post-modernism feminism) and the arts and letters (e.g. neorealism epic theatre, new wave cinema).

*Prerequisite(s):* EURO\*1200 and EURO\*2200 are recommended

*Restriction(s):* EURO\*1020

#### **EURO\*3150 Topics in European Film W (3-0) [0.50]**

This course will examine representative French, German, Italian and Spanish films in a socio-political context. It will focus on the interaction between the films' aesthetics and the political and cultural conditions in Europe. The topics to be discussed in the course will centre on the relationship between the development of major movements in European film, such as Italian Neo-Realism and the French, German and Spanish New Waves, and film makers' ideological projects such as the construction or deconstruction of national, gender and ethnic identity. (Offered in even-number years.)

#### **EURO\*4600 Honours Seminar in European Studies W (3-0) [0.50]**

A seminar course designed to explore one or more topics of European culture, history and/or business, depending on the expertise of the instructor. Students should consult the Coordinator of European Studies for specific offerings.

*Prerequisite(s):* 10.00 credits, (2 of ARTH\*1520, EURO\*1050, EURO\*1200, EURO\*2200, EURO\*2300, HIST\*2510, HIST\*3090, MUSC\*1060, POLS\*3450)

#### **EURO\*4740 Research Project in European Studies F,W (3-0) [0.50]**

An independent study course that requires a research project on an aspect of European Studies. The topic must be approved by the Coordinator of the European Studies Program. Research is undertaken with the guidance of a faculty advisor, and seminar presentations will be included. A final research paper must be written in the student's chosen core language. Note: In order to demonstrate language proficiency and complete the requirements of EURO\*4740, students have another option. They may choose to spend their third year studying at a European university, in the country where their chosen core language is spoken. Those who can demonstrate that they have successfully written a major academic paper or exam in their chosen core language while registered in a course at a European university as part of their approved study year will be waived from EURO\*4740. See the Coordinator for the European Studies program for more information.

*Prerequisite(s):* EURO\*1020, EURO\*1050, EURO\*2000, EURO\*2070,

*Restriction(s):* Approval of the Coordinator for the European Studies Program.

## External Courses

All courses labeled XSEN\*XXXX are Seneca College Courses. The corresponding Seneca Course numbers are provided. Detailed course profiles can be accessed through the Seneca College home page at <http://www.senecac.on.ca/>. All XSEN\*XXXX courses are limited to students in the B.Sc.(Tech.) program or B.Sc. Biological and Pharmaceutical Chemistry.

### XSEN\*2010 Effective Business and Technical Writing F (3-0) [0.50]

This subject introduces the study of technical writing, including specified formats such as memoranda, letters, proposals, and informal reports. The course applies and develops the skills of technical writing in a series of writing assignments placing emphasis on brevity, clarity, conciseness, unity and coherence - all essential to good technical communication. Basic research skills and effective oral communications are also covered. This course is offered at Guelph.

External Course Code(s): Seneca #SES-391

### XSEN\*2020 Management Studies: EQ and the New Workplace W (3-0) [0.50]

The major competitive advantage in today's new workplace is people. While the traditional set of technical and managerial skills is still essential, more critical are relationship skills and leadership skills. This course positions the key relationship skills essential to personal and organizational excellence and the real leaders initiate and facilitate the many challenges that require emotional resiliency. This course is taught at Seneca College.

External Course Code(s): Seneca # EQQ-501

### XSEN\*3020 Pharmaceutical Analysis F,W (2-4) [0.50]

The aim of this course is to simulate the pharmaceutical quality control laboratory. Students are introduced to pharmaceutical terms, definitions and forms, drug legislations, and regulatory agencies (FDA, TPP). Strong emphasis is placed on the navigation and interpretation of pharmacopeial compendia (USP, BP, EP). Practical aspects include physical, wet chemical and instrumental analyses of drug substances, in-process materials and finish products using official pharmacopeial methodologies. This course is taught at Seneca College.

Prerequisite(s): BIOC\*2580, CHEM\*2400

Restriction(s): Restricted to B.Sc. (TECH) and B.Sc. (BPCH)

External Course Code(s): Seneca #PHA-333

### XSEN\*3030 Pharmacology and Applied Toxicology W (3-3) [0.50]

This subject is an introduction to the general aspects of pharmacology and toxicology. The lecture topics will cover the pharmacological activity of drugs on the autonomic nervous system, central nervous system and the cardiovascular system. The laboratory practicals will focus on testing, drug screening, and clinical trial methodology. This course is taught at Seneca College.

Prerequisite(s): BIOC\*2580, CHEM\*2400

Restriction(s): Restricted to B.Sc. (TECH) and B.Sc. (BPCH)

External Course Code(s): Seneca #PHT-533

### XSEN\*3040 Occupational Health and Chemistry W (2-3) [0.50]

A general coverage of general aspects of industrial hygiene. Specific topics include Canadian legislation with respect to Occupational Safety, modes of evaluation of chemical exposure, occupational toxicology, and instrumentation associated with the evaluation of the occupational environment. This course is taught at Seneca College.

Prerequisite(s): CHEM\*2700

Restriction(s): Restricted to B.Sc. (TECH) and B.Sc. (BPCH)

External Course Code(s): Seneca #OCC-433

### XSEN\*3060 Pharmaceutical Analysis - Advanced W (2-3) [0.50]

This course reinforces the concept of how the pharmaceutical laboratory works by focusing on method validation requirements within the pharmaceutical industry. It introduces students to the regulatory (ICH, FDA) requirements and guidelines for systems validation, including TPP-acceptable methods and GMP regulations. Validation methods that are taught include Related Substances, Assay, Dissolution and Cleaning. Critical validation parameters (e.g., linearity, specificity, limit of quantitation, etc.) are focused on as well as validation protocols including establishing specifications and dealing with exceptions or out-of-specification (OOS) results. Process validation characteristics (i.e., Design Qualification (DQ), Installation Qualification (IQ), Operation Qualification (OQ), Performance Qualification(PQ) or System Suitability) are also emphasized as well as "Best Practices" such as Process Capabilities and Annual Product Review. This course is taught at Seneca College.

Prerequisite(s): XSEN\*3020

Restriction(s): Restricted to B.Sc. (TECH) and B.Sc. (BPCH)

External Course Code(s): Seneca #PHA-533

### XSEN\*3070 Pharmaceutical Product Formulations F,W (2-3) [0.50]

This subject deals with the theoretical and practical aspects of pharmaceutical product formulation with an emphasis on semi-solid and liquid formulations. The students prepare and test ointments, creams, lotions, and syrups in the laboratory. Formulation as it relates to overall product stability and efficacy is also covered in both theoretical and practical terms. This course is taught at Seneca College.

Prerequisite(s): CHEM\*3750

Restriction(s): XSEN\*4030 Restricted to B.Sc. (TECH) and B.Sc. (BPCH)

External Course Code(s): Seneca #PPF-633

### XSEN\*3080 Pharmaceutical Manufacturing F,W (2-3) [0.50]

This course is an introduction to the important principles and methods related to the production of pharmaceuticals. Topics include methods of manufacture of important dosage forms, regulations governing various dosage forms, good manufacturing practice as defined by regulatory bodies and an overview of the manufacturing plant during the various stages of production with emphasis on GMP. This course is taught at Seneca College.

Prerequisite(s): BIOC\*3570, CHEM\*3750

Restriction(s): XSEN\*4040 Restricted to B.Sc. (TECH) and B.Sc. (BPCH)

External Course Code(s): Seneca #PYM-633

### XSEN\*3090 Biopharmaceuticals F,W (3-0) [0.50]

This subject introduces the student to the rapidly developing field of biotechnology and biopharmaceuticals. Techniques used in the development of biopharmaceuticals will be emphasized as well as large-scale production of biologicals manufactured by genetic engineering processes. This course is taught at Seneca College.

Prerequisite(s): BIOC\*2580, CHEM\*2700

Restriction(s): XSEN\*4050 , Registration in B.Sc. (TECH) or B.Sc. (BPCH) Major

External Course Code(s): Seneca #BPH-633

### XSEN\*3100 Communications Fundamentals F,W (3-2) [0.50]

This is an overview course that provides coverage of major analog and digital communications topics, including both analog and digital modulation principles and the nature and behavior of pulse waveforms. This course is taught at Seneca College.

External Course Code(s): Seneca #COM 455

### XSEN\*3120 Microprocessors I F,W (3-2) [0.50]

This introductory microcontroller subject deals with both the hardware and software of 8-bit devices. The primary example used is the Motorola MC68HC11. The subject examines two major areas: introductory computer/microcontroller concepts, and assembler language programming. A substantial amount of time is devoted to practical laboratory work. This course is taught at Seneca College.

Prerequisite(s): CIS\*2500, PHYS\*2040

External Course Code(s): Seneca #MCO-455

### XSEN\*3130 Object Oriented Programming Using C++ F,W (2-2) [0.50]

The course uses the C++ programming language as a tool to implement Object Oriented Programming (OOP) concepts. The OOP concepts such as Classes, Member and Friend Functions, Constructor and Destructor Functions, Operator Overloading, Inheritance, Composition, Virtual Functions and Polymorphism, Stream I/O, Templates and Exception Handling are covered, as well as the OOP methods. This course is taught at Seneca College.

Prerequisite(s): CIS\*2500

External Course Code(s): Seneca #PRG 355

### XSEN\*3140 Operating Systems F,W (2-2) [0.50]

This subject explores the system concepts, command languages and application of several operating system platforms such as UNIX. This course is taught at Seneca College.

Prerequisite(s): CIS\*1500, (CIS\*2030 recommended)

External Course Code(s): Seneca #DPR-355

### XSEN\*4010 Pharmaceutical Calculations W (3-0) [0.50]

This subject deals with computations relevant to pharmaceutical topics. Included are the representation of scientific and technical data, chemical kinetics and drug stability, osmo-lality and tonicity, pH and solubility, viscosity, phase rule and numerous pharmaceutical calculations (e.g. manufacturing formulas, dosage formulations, radiochemistry, concentration, alligation, HLB, etc.). This course is taught at Seneca College.

Prerequisite(s): BIOC\*3570, CHEM\*2400

External Course Code(s): Seneca #PHC-533

**XSEN\*4020 Pharmaceutical Organic Chemistry F (1-3) [0.50]**

The determination of the structure of organic compounds using spectroscopic methods such as N.M.R. and mass spectroscopy are discussed. Correlation of structure and reactivity (i.e. drug activity) of organic compounds is also explored. A multi-step synthesis of an anesthetic (lidocaine) and mass-spectrometric analysis of an unknown organic compound (or mixture) are examples of lab-projects. This course is taught at Seneca College.

*Prerequisite(s):* CHEM\*3750

*External Course Code(s):* Seneca #PAC-633

**XSEN\*4100 Event Driven Programming and Visual Basic F,W (2-2) [0.50]**

This course covers the essential programming concepts supported by the Visual Basic programming language, including: object-oriented programming, database management, activeX controls, file I/O, user-defined data types. Various objects (forms, modules and controls) provided by Visual Basic will be used. The course will introduce the fundamental concepts of the event-driven and visual programming. Visual Basic Professional Edition will be used as the integrated development environment. The interaction between Visual Basic and various DBMS software packages will be introduced. This course is taught at Seneca College.

*Prerequisite(s):* XSEN\*3130

*External Course Code(s):* Seneca #PRG-455

**XSEN\*4120 Data Communications I F,W (4-2) [0.50]**

This course has been designed to provide an in-depth understanding of the underlying principles of the rapidly expanding and changing discipline of Data Communications. The following topics in this subject are discussed: terminology, components, network design and configurations, transmission media including fibre optical design methods, protocols, topologies, architectures, private and public network strategies and LAN vendors. This course is taught at Seneca College.

*Prerequisite(s):* XSEN\*3100

*External Course Code(s):* Seneca #DCM-555

**XSEN\*4130 Networking Essentials F,W (1-3) [0.50]**

This course provides students with good coverage of networking principles, including network installation and management basics using current operating systems. The course covers CNA level 1 material. This course is taught at Seneca College.

*Prerequisite(s):* CIS\*2500, XSEN\*3140

*External Course Code(s):* Seneca #NET-455

**XSEN\*4140 Technical and Personal Communications F,W (4-0) [0.50]**

This course combines reading, writing, and basic research skills and applied them to technical materials and situations. Today, technical firms insist on strong communication skills in their employees, not just technical competence. Oral and written presentations of material, as well as project-related research, will be required elements of this course. This course is taught at Seneca College.

*External Course Code(s):* Seneca #TPC-455

**XSEN\*4160 Network Servers and Peripherals F,W (2-2) [0.50]**

This course introduces the student to multi-OS network environments with emphasis on operating system configuration, troubleshooting, network administration and maintenance. Specific topics include Windows 2000/XP/2003 and Linux installation and/or configuration, server setup and interoperability in multi-OS network environments, backup systems, printer systems, network attached storage and network security. In conjunction with the microcomputer repair course MIR355 and operating system/networking knowledge from other courses in the program, this course also prepares students for SMB (small and medium business) network consulting. This course is taught at Seneca College.

*Prerequisite(s):* XSEN\*4130

*External Course Code(s):* Seneca #NSP-655

**XSEN\*4180 Real-Time Embedded Microcontroller Applications F,W (3-3) [0.50]**

This course will concentrate on the chip functionality of the MCHCS6812 series of microcontrollers. The intent of the course will be to understand and implement the following chip functions in real time applications: Enhanced Capture Timer, Output Compare, Input Capture, Pulse Width Modulation, Serial Communications, Analog to Digital Conversion, Digital to Analog Conversion. Projects will make use of a PC based Human Machine Interface (HMI) design programmed by the student in Visual Basic or Visual C++ that is used to serially (via the SCI) collect data from and control functions in the microcontroller. This course is taught at Seneca College.

*Prerequisite(s):* XSEN\*3120

*Equate(s):* XSEN\*4150

*External Course Code(s):* Seneca #MCO-556

**XSEN\*4190 Data Acquisition, Interfacing and Control F,W (3-2) [0.50]**

This course introduces students to the practical aspects of using PC for real-time data acquisition and digital control. It develops the skills in programming the PC interfaces such as serial, USB, and Ethernet for Data Acquisition and Control (DA&C) for applications such as servo control, and provides the fundamentals of I/O techniques and PID (Proportional + Integral + Derivative) control. A lab environment which consists of servos, servo digital boards, units of interfacing ports, digital oscilloscopes, and PCs is set up for hands-on lab assignments and project. This course is taught at Seneca.

*Prerequisite(s):* CIS\*2500, MATH\*2170

*Equate(s):* XSEN\*4110

*External Course Code(s):* Seneca # DAC554

## Family Relations and Human Development

*Department of Family Relations and Applied Nutrition.*

*These courses support two majors offered by the Department of Family Relations and Applied Nutrition: Adult Development, and Child, Youth and Family.*

### FRHD\*1010 Human Development W (3-0) [0.50]

This course is an introduction to the study of the development of the individual throughout the life cycle. Emphasis will be placed on the interrelationships between physiological, sociological and psychological aspects of normal human development. (Also offered through Distance Education format.)

*Restriction(s):* Not available to Child, Youth & Family or Child, Youth & Family Co-op majors.

### FRHD\*1020 Couple and Family Relationships W (3-0) [0.50]

A survey of family dynamics throughout the life course, emphasizing themes of power, intimacy and family diversity. Topics may include; gender socialization, sexuality, mate selection, communication, abuse, couple interaction, parent-child relations, divorce, remarriage. (Also offered through Distance Education format.)

*Equate(s):* FRHD\*2010

### FRHD\*1100 Life: Health and Well-Being F (3-0) [0.50]

This course integrates the theory, application and research of various aspects of health-related topics across the lifespan, emphasizing relevance to the lives of young adults.

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods.

### FRHD\*2040 Principles of Program Design for Children W (3-0) [0.50]

This course will examine the elements involved in planning and implementing quality play-based programs for young children. Some of the issues include: the role of the teacher, meeting developmental needs, the materials and the organization of the environment, and instructional strategies. The course will involve a workshop component.

*Prerequisite(s):* FRHD\*2270 or PSYC\*2450

*Restriction(s):* Restricted to students in B.A.Sc. Program (CYF, CYF:C majors).

### FRHD\*2060 Adult Development and Aging F (3-0) [0.50]

This course provides an overview of major theoretical approaches, research issues and methodologies, and significant research findings which relate to adult development and aging.

*Prerequisite(s):* 1 of ANTH\*1150, FRHD\*1010, PSYC\*1200, SOC\*1100

### FRHD\*2100 Development of Human Sexuality F (3-0) [0.50]

This course covers a social scientific analysis of human sexuality. Emphasis will be placed on the development of sexuality within an interpersonal context. (Also offered through Distance Education format.)

*Prerequisite(s):* 4.50 credits

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods.

### FRHD\*2110 Exceptional Children and Youth W (3-0) [0.50]

An overview of childhood exceptionalities including intellectual differences, communication disorders, sensory impairments, developmental and behaviour disorders, and health problems. Issues faced by the exceptional child as well as the parents and siblings are discussed. (Also offered through Distance Education format.)

*Prerequisite(s):* FRHD\*1020, [2 of FRHD\*2260, FRHD\*2280, (FRHD\*2270 or PSYC\*2450)]

### FRHD\*2260 Infant Development W (3-0) [0.50]

This course is an examination of developmental principles and milestones characterizing infant development from conception to 24 months. Emphasis will be placed on understanding the nature of the reciprocal family-infant interactions during this period, and on the societal context influencing those interactions. (Also offered through Distance Education format.)

*Prerequisite(s):* (PSYC\*1100 or PSYC\*1200), (1 of ANTH\*1150, FRHD\*1010, SOC\*1100)

*Equate(s):* CSTU\*2260

### FRHD\*2270 Development in Early and Middle Childhood F (3-0) [0.50]

This course is an examination of development in the early and middle childhood years, with emphasis on family and societal contexts.

*Prerequisite(s):* FRHD\*1010 or (PSYC\*1200 and ANTH\*1150) or (PSYC\*1200 and SOC\*1100)

*Equate(s):* CSTU\*2270

*Restriction(s):* PSYC\*2450

### FRHD\*2280 Adolescent Development W (3-0) [0.50]

This course examines psychosocial development in adolescence, emphasizing physiological, social and emotional changes. (Also offered through Distance Education format.)

*Prerequisite(s):* 1 of ANTH\*1150, FRHD\*1010 FRHD\*1100, PSYC\*1100, PSYC\*1200, SOC\*1100

### FRHD\*2300 Principles of Program Design for Youth W (3-0) [0.50]

This course will examine the elements involved in planning and implementing effective prevention, education, and support programs for youth and their families. Programs include alternative education, independent living, community justice initiatives, sexual health, and physical education and nutrition strategies. Major topics covered in this course include: the roles of organizations and child and youth counsellors; empowerment of youth, their families and communities; working with diverse populations; needs assessments; program planning and service delivery; and program evaluation. Case studies of innovative programs are highlighted.

*Prerequisite(s):* FRHD\*2280, (FRHD\*2060 or FRHD\*2270)

*Restriction(s):* Restricted to students in B.A.Sc. CYF and CYF:C.

### FRHD\*2350 Principles of Program Design in the Human Services W (3-0) [0.50]

This course will examine the elements involved in planning and implementing effective prevention, education, and support programs for various populations in community settings. Programs include health promotion, sexual health, and support programs for new parents, new Canadians, seniors, caregivers, and individuals with disabilities. Major topics covered in this course include: the roles of organizations and human service professionals; empowerment within individuals, families and communities; working with diverse populations; needs assessments; program planning and service delivery; and program evaluation. Case studies of innovative programs are highlighted.

*Prerequisite(s):* FRHD\*1100

*Restriction(s):* Restricted to students in B.A.Sc. ADFW, ADFW:C, ADEV, ADEV:C.

### FRHD\*3040 Parenting and Intergenerational Relationships W (3-0) [0.50]

This course is a study of research concerning parent-child relationships across the lifespan.

*Prerequisite(s):* 9.50 credits including FRHD\*1020, (1 of FRHD\*1100, FRHD\*2270, PSYC\*2450)

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods.

### FRHD\*3060 Principles of Social Gerontology F (3-0) [0.50]

A study of social and health aspects of individual and population aging, including theories and implications for understanding and working with the elderly.

*Prerequisite(s):* 9.50 credits including (FRHD\*1020 or SOAN\*3100)

### FRHD\*3070 Research Methods: Family Studies F (3-0) [0.50]

This course is a critical examination of research methods in family studies.

*Prerequisite(s):* 4.50 credits

*Restriction(s):* Restricted to students in B.A.Sc.

### FRHD\*3090 Poverty and Health F (3-0) [0.50]

This course offers an in-depth examination of the factors associated with poverty across the lifespan, with a focus on the relationships between poverty and health and development. Poverty within vulnerable groups, issues concerning inequality and strategies to address poverty will also be explored. (Offered in odd-numbered years)

*Prerequisite(s):* 9.50 credits

### FRHD\*3120 Families in Canadian Context W (3-0) [0.50]

Canadian families are studied from a structural perspective and are placed in social and historical context. Topics include structural variations in family form, work roles within and outside the family, the structural significance of marriage and parenthood, and social policies affecting families.

*Prerequisite(s):* FRHD\*1020

### FRHD\*3150 Strategies for Behaviour Change W (3-0) [0.50]

This course will review the nature and use of behaviour change strategies commonly used in interventions with children, youth, and their families.

*Prerequisite(s):* 2 of FRHD\*1010, FRHD\*2060, FRHD\*2260, FRHD\*2270, FRHD\*2280

*Restriction(s):* This is a Priority Access Course for ADEV, ADEV:C, ADFW, ADFW:C, CYF, CYF:C and FCS minor and some restrictions may apply during some time periods.

**FRHD\*3180 Observation and Assessment Laboratory F,W (2-1) [0.50]**

Direct observation as a strategy for collecting information on children's behaviour in applied and research settings is the focus of this laboratory course. Emphasis will be placed on theory, recording and interpreting observational data and communicating findings in written reports.

*Prerequisite(s):* (FRHD\*2040 or FRHD\*2300), FRHD\*2110

*Co-requisite(s):* FRHD\*3200 or FRHD\*3250

**FRHD\*3190 Administration of Programs for Children W (3-0) [0.50]**

This course examines the roles and responsibilities of administrators in programs for children with emphasis on the development of appropriate policies and procedures; management of human and financial resources; and internal and external communication within the context of multidisciplinary settings. Attention will be given to quality assurance, professional ethics, and continuing professional development. (Offered through Distance Education only.) (Offered in even numbered years)

*Prerequisite(s):* 7.00 credits including (1 of FRHD\*2260, FRHD\*2270, PSYC\*2450)

**FRHD\*3200 Practicum - Child F,W (2-10) [1.00]**

This practicum provides students with a seminar and supervised experience with children and is designed to demonstrate the application of theory studied earlier in the program. It will also provide opportunities for working directly with young people while examining such topics as the role of the teacher, teacher-child interaction, and program implementation. Students wishing to enrol in this course must consult with the instructor during course selection.

*Prerequisite(s):* FRHD\*1020, FRHD\*2040, NUTR\*1010

*Equate(s):* CSTU\*3170, FRHD\*3170

*Restriction(s):* Registration in the B.A.Sc. program (Child, Youth and Family or Child, Youth and Family Co-op majors). Instructor consent required.

**FRHD\*3250 Practicum in Youth F,W (3-12) [1.00]**

Through seminar and supervised experience with youth, students will demonstrate the application of theory studied earlier in the program. This practicum course will also provide opportunities for working directly with youth in a community setting while examining the role of the professionals involved and the communication with youth and community members. Developing skills in programming planning, implementation, and evaluation is a primary objective. Students wishing to enrol in this course must consult with the instructor during course selection.

*Prerequisite(s):* FRHD\*1020, NUTR\*1010, FRHD\*2300

*Restriction(s):* Registration in the B.A.Sc. program (Child, Youth and Family or Child, Youth and Family Co-op majors). Instructor consent required.

**FRHD\*3290 Practicum I: Adult Development F,W (3-12) [1.00]**

This course offers students an opportunity to participate in seminar and supervised field placement in health and social service agencies. The practicum and seminar will develop students' helping roles in agencies and facilitate the integration and application of theoretical knowledge from previous course work with practice. It will also provide opportunities for students to work directly with individuals and/or groups and to participate in on-going programs or services. Students wishing to enrol in this course must consult with the instructor during the course selection period.

*Prerequisite(s):* FRHD\*2350, FRHD\*3400

*Restriction(s):* Restricted to students in B.A.Sc. ADEV, ADEV:C, ADFW, ADFW:C. Instructor consent required.

**FRHD\*3400 Communication and Counselling Skills F,W (3-0) [0.50]**

This course is an examination and analysis of the theories and methods of communication as applied within the processes of family counseling and consultation.

*Prerequisite(s):* 9.50 credits including (FRHD\*1020 or FRHD\*1100)

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods.

**FRHD\*4020 Family Theory F (3-0) [0.50]**

This course analyses theoretical approaches and concepts in the study of the family.

*Prerequisite(s):* 12.50 credits including FRHD\*1020

**FRHD\*4070 Topics in Family Relations and Human Development U (3-0) [0.50]**

Lecture-discussion or seminar on a selected topic in family studies. To be conducted by regular or visiting faculty with expertise in the area. Students should check with the Department of Family Relations and Applied Nutrition to determine what topic will be offered during specific semesters and which prerequisites, if any, are appropriate.

**FRHD\*4080 Topics in Family Relations and Human Development U (3-0) [0.50]**

Lecture-discussion or seminar on a selected topic in family studies. To be conducted by regular or visiting faculty with expertise in the area. Students should check with the Department of Family Relations and Applied Nutrition to determine what topic will be offered during specific semesters and which prerequisites, if any, are appropriate.

**FRHD\*4090 Topics in Family Relations and Human Development U (3-0) [0.50]**

Lecture-discussion or seminar on a selected topic in family studies. To be conducted by regular or visiting faculty with expertise in the area. Students should check with the Department of Family Relations and Applied Nutrition to determine what topic will be offered during specific semesters and which prerequisites, if any, are appropriate.

**FRHD\*4160 Family Relations in Gerontology F (3-0) [0.50]**

A critical examination of selected issues affecting the well-being of the elderly in Canada. Topics will include such issues as the nature and types of community support systems for the aged, and institutionalization and its alternatives.

*Prerequisite(s):* FRHD\*3060

**FRHD\*4170 Practicum - Child, Youth and Family F,W (3-16) [1.00]**

Seminar and experience with children in an appropriate field setting to be assigned by the department. Emphasis will be upon developing, implementing and evaluating program plans for children in educational and community settings. Students will acquire communication and interactive skills with children and adults. Students wishing to enrol in the course must consult with the course instructor during the course selection period.

*Prerequisite(s):* 1 of FRHD\*3170, FRHD\*3200, FRHD\*3250

*Restriction(s):* Instructor consent required.

**FRHD\*4180 Assessment and Intervention F (2-2) [0.50]**

Principles and theories of assessment and evaluation as related to the child, the family, and to child oriented intervention, education and social service programs are examined in this course.

*Prerequisite(s):* FRHD\*2110, FRHD\*3070, FRHD\*3180

*Restriction(s):* Registration in the B.A.Sc. program (Child, Youth and Family or Child, Youth and Family Co-op majors).

**FRHD\*4190 Assessment in Gerontology F (2-2) [0.50]**

This course provides an examination and critique of current methods of assessing older adults. Tools to be considered include those for assessing dementia, depression, and pain. Students will examine diagnostic criteria that form the underpinnings of most tests and then examine each test for its psychometric properties and appropriate use. An understanding of the ethical principles governing assessment will be gained.

*Prerequisite(s):* FRHD\*2060

*Restriction(s):* Semester 7 and above.

**FRHD\*4200 Issues in Human Sexuality W (3-0) [0.50]**

An advanced analysis of sexual development. Specific attention will be given to sexual problems, and the concepts, methods and issues associated with sex education and counselling.

*Prerequisite(s):* FRHD\*1020, FRHD\*2100 and 1.00 credit at the 3000 level in Family and Social Relations, Psychology or Sociology

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods.

**FRHD\*4210 Senior Seminar in Early Education and Care F (3-0) [0.50]**

The course offers a study of the historical and philosophical basis of programs for young children evaluated from a developmental perspective. Emphasis will be on current approaches and programs and contemporary issues in early childhood programming.

*Prerequisite(s):* FRHD\*3200

*Equate(s):* CSTU\*4210

**FRHD\*4250 Aging and Health W (3-0) [0.50]**

This course offers upper level undergraduates a forum to explore issues related to aging and health across the adult life span. More specifically, the conceptual groundwork necessary for understanding the roles of the life span developmental perspective, individual development, physiological changes in human aging, contextual influences and interactions, and several models/theories of aging and health will be examined. A primary objective of the course is the integration of models and theory to facilitate understanding of aging and health topics. Topics include but are not limited to: age changes and disease processes (both acute and chronic); mental health and illnesses; medication use; disease prevention and health promotion; influence of health on family relationships, caregiving, and placement decisions; systemic and societal influences on health; and ethical issues and controversies surrounding the end-of-life care and decision making, advanced directives, assisted suicide, and death and dying.

*Prerequisite(s):* 10.00 credits including FRHD\*2060

**FRHD\*4260 Social Policy and Gerontology W (3-0) [0.50]**

An examination of aging and adult development in relation to social policy with special reference to families.

*Prerequisite(s):* FRHD\*2060



**FRHD\*4290 Practicum II: Adult Development F,W (3-16) [1.00]**

This course enables students to extend their knowledge and professional skills in a second supervised placement in a health or social service agency. The practicum and seminar provides students with additional opportunities to integrate theoretical knowledge with practice experiences. Students are expected to assume additional responsibilities related to program design and implementation and in their supervised work with individuals and/or groups. Students wishing to enrol in this course must consult with the instructor during the course selection period.

*Prerequisite(s):* FRHD\*3290

*Restriction(s):* Restricted to students in B.A.Sc. ADEV, ADEV:C, ADFW, ADFW:C. Instructor consent required.

**FRHD\*4310 Professional Issues F (3-0) [0.50]**

This course examines ethical and professional issues in working with children, youth, adults of all ages, and their families. A variety of institutional settings are considered (e.g., school systems, treatment agencies, youth residential programs, senior care facilities). The complexities of professional practice with diverse populations are explored in depth. Legal aspects relevant to work in this area are also addressed.

*Prerequisite(s):* FRHD\*3400

**FRHD\*4320 Social Policies for Children, Youth and Families W (3-0) [0.50]**

This course focuses on current social policies, programs, and services that affect children's development and family well-being. Issues include policies that affect income security, parental effectiveness, social service provision, and community resources.

*Prerequisite(s):* FRHD\*3040

**FRHD\*4400 Youth, Risk and Resilience W (3-0) [0.50]**

This course examines biological, and social-contextual aspects of developmental issues evident in childhood and adolescence. The theoretical perspective of developmental psychopathology will be used to examine literatures relating to risk, resilience, developmental trajectories, classification, assessment, and intervention. Students will have a chance to critically examine many mental health issues commonly found in childhood and adolescence.

*Prerequisite(s):* 15 credits including FRHD\*2110, FRHD\*2280

**FRHD\*4810 Thesis I U (3-0) [0.50]**

Planning, developing and writing a research proposal under individual faculty supervision. Topic to be decided by the student in consultation with the supervisory faculty member before she/he may course select or register for the course. Students are advised to contact the Department of Family Relations and Applied Nutrition for further information.

*Prerequisite(s):* FRHD\*3070

*Equate(s):* CSTU\*4810

*Restriction(s):* Instructor consent required.

**FRHD\*4910 Thesis II U (6-0) [1.00]**

The student will conduct and write an undergraduate thesis under the direction of a faculty member.

*Prerequisite(s):* FRHD\*4810

*Equate(s):* FRHD\*4911/2

## Food Science

### Department of Food Science

#### **FOOD\*2010 Principles of Food Science S,W (3-0) [0.50]**

The principles involved in the processing, handling and storage of foods are introduced in this course. The relationship of science and technology to food processing is discussed. (Offered through Distance Education only.)

*Restriction(s):* FOOD\*2150, FOOD\*3090, NUTR\*2150

#### **FOOD\*2100 Communication in Food Science W (3-0) [0.50]**

Students will acquire basic skills in technical and business communication and be prepared to complete a variety of communication assignments in subsequent semesters. Students will learn and apply the principles of effective written and oral communication.

*Restriction(s):* Restricted to students in B.Sc. FOOD or FOOD:C majors.

#### **FOOD\*2150 Introduction to Nutritional and Food Science F (3-0) [0.50]**

This interdisciplinary course provides an introduction to the Food and Nutritional Sciences from both historical and modern perspectives. Major themes are the nutritional and functional properties of food, nutrient assimilation, food preservation and safety, and the interactions between food processing, diets and health. The course is taught by the Department of Food Science. (Also listed as NUTR\*2150.)

*Prerequisite(s):* (BIOL\*1040 or BIOL\*1080), CHEM\*1040

*Equate(s):* NUTR\*2150

*Restriction(s):* FOOD\*2010, FOOD\*3090. Not available to students registered in B.A.Sc. AHN major.

#### **FOOD\*2400 Introduction to Food Chemistry S (3-0) [0.50]**

The chemistry and biochemistry of the major components of foods (lipids, proteins, carbohydrates and water/ice) are introduced in this course. In addition, an overview of some of the reactions and changes in food components which occur during processing, handling and storage will be presented. This course may not be taken for credit by students in the Food Science Major. (Offered through Distance Education only.)

*Prerequisite(s):* CHEM\*1040

*Restriction(s):* FOOD\*3030

#### **FOOD\*2410 Introduction to Food Processing W (3-0) [0.50]**

Food processes and the relationships between chemistry, microbiology, and engineering as they apply to food processing are discussed. The following topics are included: high and low temperature processes; moisture control and intermediate moisture foods; concentration and dehydration processes; and novel food processing techniques. (Offered through Distance Education only.)

*Prerequisite(s):* CHEM\*1040, (1 of BIOL\*1040, BIOL\*1070, BIOL\*1080, MICR\*1020, MICR\*2420)

*Restriction(s):* FOOD\*3160, FOOD\*3170 Not available to students registered in B.Sc. FOOD or FOOD:C majors.

#### **FOOD\*2420 Introduction to Food Microbiology F (3-0) [0.50]**

An introduction to the major groups of microorganisms important in foods is presented in this course, including microbial spoilage of food, food-borne illness, and food fermentations. Sources of contamination during production, processing and storage of foods and evaluation of food processing conditions used to control the presence and/or growth of microorganisms in foods are discussed. (Offered through Distance Education only.)

*Prerequisite(s):* 1 of BIOL\*1040, BIOL\*1070, MICR\*1020, MICR\*2420

*Restriction(s):* FOOD\*3230 Not available to students registered in B.Sc. FOOD or FOOD:C majors.

#### **FOOD\*2620 Food Engineering Principles W (3-2) [0.50]**

Introduction to engineering principles and operations in food processing including heat transfer, fluid flow, material and energy balances, instrumentation and process control concepts.

*Prerequisite(s):* (BIOC\*2580 or CHEM\*2880), (MATH\*1080 or MATH\*1200)

#### **FOOD\*3030 Food Chemistry I F (3-3) [0.50]**

This course covers the fundamental principles of the chemistry of foods. The course will discuss selected topics related to the chemistry (physical, organic and analytical) and physics of the major components in food materials such as lipids, proteins, carbohydrates and water.

*Prerequisite(s):* BIOC\*2580

#### **FOOD\*3040 Food Chemistry II W (3-3) [0.50]**

This course covers the fundamental principles of the chemistry of foods, as a continuation of FOOD\*3030. The course will discuss selected topics related to the chemistry (physical, organic and analytical) and physics of some minor components in food materials such as pigments, flavors, enzymes and processing additives.

*Prerequisite(s):* FOOD\*3030

#### **FOOD\*3090 Food Science and Human Nutrition F (3-2) [0.50]**

This course will introduce students in the B.Sc.(Agr.) program to the chemistry and microbiology of food and post-production food handling and processing. It will also introduce students to the role of food components in human nutrition and the interactions between diets and health. Food product development will integrate these two disciplines. Lectures will be taken simultaneously with students in FOOD\*2150/NUTR\*2150. Lectures will be supplemented with a series of laboratory assignments.

*Prerequisite(s):* AGR\*1250, (BIOL\*1040 or BIOL\*1080), CHEM\*1040

*Restriction(s):* FOOD\*2010, FOOD\*2150, NUTR\*2150. Restricted to students in B.Sc.(Agr.)

#### **FOOD\*3160 Food Processing I F (3-3) [0.75]**

This course builds on basic engineering principles to understand the operation of modern food processing plant facilities. The standard equipment used and the underlying principles that control their operation are examined for various high temperature (blanching, pasteurization, sterilization, evaporation, drying, extrusion) and ambient temperature (size reduction, homogenization, emulsification, centrifugation, filtration, extraction, irradiation) unit operations.

*Prerequisite(s):* ENGG\*2660 or [FOOD\*2620, (MICR\*2030 or MICR\*2420)]

#### **FOOD\*3170 Food Processing II W (3-3) [0.50]**

This course looks at various low temperature food processing unit operations (e.g., refrigerated storage, freezers, freeze driers), the design and operation of ancillary food plant equipment (e.g., refrigeration, boiler, pumping, control, sanitation, water, and wastewater treatment systems) and integration of the various unit operations into a functioning food process.

*Prerequisite(s):* FOOD\*3160

#### **FOOD\*3230 Food Microbiology F (3-3) [0.75]**

Important groups of microorganisms associated with food spoilage, food fermentations, food infections and intoxications are discussed in this course. Intrinsic and extrinsic factors and their relationship to microbial growth, control of microorganisms by food processing and application of Hazard Analysis Critical Control Points (HACCP) programs are also discussed. Laboratory classes will provide experience in microbiological techniques, sampling and basic genetic engineering.

*Prerequisite(s):* 1 of MICR\*1020, MICR\*2030, MICR\*2420

#### **FOOD\*3260 Industrial Microbiology W (3-3) [0.50]**

The course will present microbiological and technological principles of the industrial application of microorganisms followed by specific examples. Lectures will cover the basics of metabolic pathways and how these can be manipulated through selection or genetic engineering to increase productivity. The main focus of the course will be in the production of alcoholic beverages but will also include production of biomass, solvents, amino acids and organic acids of direct relevance to the food industry. The laboratory component of the course will include wine production, beer brewing and dairy fermentations. Field trips to a commercial winery and brewery will also aid the learning experience.

*Prerequisite(s):* 1 of MICR\*1020, MICR\*2020, MICR\*2030, MICR\*2420

*Restriction(s):* Students must be of legal drinking age in the Province of Ontario.

#### **FOOD\*3430 Introduction to Food Analysis F (3-0) [0.50]**

An introduction to quantitative analysis of foods by chemical, physical and instrumental means. Determination of major and minor constituents of foods. (Offered through Distance Education only.)

*Prerequisite(s):* FOOD\*2400

*Restriction(s):* FOOD\*4120

#### **FOOD\*3700 Sensory Evaluation of Foods W (3-3) [0.50]**

The principles of sensory evaluation of foods and the techniques employed are studied in the course.

*Prerequisite(s):* (FOOD\*2150 or HTM\*2700), (1 of STAT\*2040, STAT\*2060, STAT\*2080)

*Restriction(s):* This is a priority access course. Registration may be restricted to students in BSCH.FOOD, BSCH.FOOD:C or BASC.AHN during certain periods.

#### **FOOD\*4070 Food Packaging F (3-0) [0.50]**

Functions of packaging in food preservation systems will be examined using a review of current packaging materials, their properties, production methods and applications for specific products. Additional topics include regulatory, environmental and marketplace influences on food packaging choices.

*Prerequisite(s):* 8.00 credits in science or engineering

**FOOD\*4090 Functional Foods and Nutraceuticals W (3-0) [0.50]**

The course examines the relation of functional foods and nutraceuticals (FFN) to food and drugs. The safety and efficacy of individual FFN products, and the regulatory issues that influence the development and commercialization of FFN in global markets are emphasized. The course is co-operatively taught by the Department of Human Health and Nutritional Sciences and the Department of Food Science. (Also listed as NUTR\*4090.)

*Prerequisite(s):* NUTR\*3210

*Equate(s):* NUTR\*4090

**FOOD\*4110 Meat and Poultry Processing W (2-3) [0.50]**

The course focuses on the principles and techniques employed by the meat industry in the production of raw and semi/fully cooked products. Lectures include a study of muscle structure and its relation to meat quality, the physical properties of meat proteins, lipids and flavour compounds important in meat processing. Practical applications of processing techniques (including producing different products in lab) packaging and merchandizing are emphasized in the laboratory. Other sources of animal proteins, such as eggs, are also covered. Emphasis is put on learning how various food science principles (e.g. emulsification, preservation, HACCP) are used to optimize meat products' quality and safety. (Offered in odd-numbered years.)

*Prerequisite(s):* 1 of ANSC\*2340, FOOD\*3090, FOOD\*3160

**FOOD\*4120 Food Analysis F (3-4) [0.50]**

In this course the quantitative analysis of foods by chemical and physical methods will be studied. Both major and minor constituents will be determined.

*Prerequisite(s):* 1 of CHEM\*2400, CHEM\*2480, FOOD\*3030, which may be taken as co-requisite

**FOOD\*4220 Topics in Food Science S,F,W (0-2) [0.25]**

Independent study of a selected topic in Food Science, involving a review and critical evaluation of the current literature. The course comprises independent library research and students are required to present a concise report in a written paper and in a seminar. Students must make arrangements with both faculty supervisor and the course co-ordinator in a prior course selection period.

*Prerequisite(s):* 2.50 credits at the 3000 level in Food Science

*Restriction(s):* Instructor consent required.

**FOOD\*4230 Research in Food Science S,F,W (0-2) [0.25]**

This course involves independent laboratory research of a selected topic in Food Science, under the supervision of an individual faculty. The laboratory research is based on the literature review conducted in FOOD\*4220. In addition, a review and critical appraisal of experimental principles will guide the design of laboratory experiments. Students are required to present a concise report in a written paper and in a seminar. Students must make arrangements with both faculty supervisor and the course co-ordinator in a prior course selection period.

*Prerequisite(s):* FOOD\*4220

*Co-requisite(s):* FOOD\*4220

**FOOD\*4310 Food Safety Management Systems W (3-0) [0.50]**

Participants will learn and apply principles of food safety management and the systems involved. The course is organized in four modules: plant hygiene, principles of Hazard Analysis Critical Control Point (HACCP), HACCP based food safety programs in Canada, and ISO Food Safety Management Systems. (Offered through Distance Education format only.)

*Prerequisite(s):* (FOOD\*2010 or FOOD\*2150), (FOOD\*2410 or FOOD\*3160), (FOOD\*2420 or FOOD\*3230)

**FOOD\*4400 Dairy Processing W (3-3) [0.50]**

The production, processing, chemistry, microbiology and marketing of fluid milk, frozen dairy products, cheese, fermented dairy foods and butter are studied in this course. Public health aspects of pasteurization are emphasized.

*Prerequisite(s):* BIOC\*2580, (FOOD\*2150 or FOOD\*3090), (MICR\*2030 or MICR\*2420)

**FOOD\*4520 Utilization of Cereal Grains for Human Food F (3-3) [0.50]**

The course will cover topics related to the history of agriculture as it relates to cereal grains; basic principles behind grain breeding and its relevance to grain quality and functionality; regulations as they relate to grain quality; fractionation of cereal components and their utilization; relationship between grain structure/ composition and processing of cereal-based foods; principles of analytical tools commonly used to assess grain and product quality; science and technology as it relates to manufacturing and shelf life of common cereal-based foods from wheat, corn, rice and barley; functional and nutritional attributes of cereal grains; recent advances in cereal science and technology and the non-food uses of cereal grain components.

*Prerequisite(s):* BIOC\*2580, (1 of BIOL\*1040, BIOL\*1070, BIOL\*1080)

**FOOD\*4600 Food Product Development W (3-6) [1.00]**

This capstone course provides opportunity for students to apply and further develop acquired knowledge, technical skills and communication skills. Research, management processes, communication, and technical innovation relevant to effective development and introduction to the market of safe, competitive food products are examined. Students work in teams to plan and execute a major food development project and communicate its results.

*Prerequisite(s):* FOOD\*2100, FOOD\*3030, FOOD\*3160, FOOD\*3230, FOOD\*3700

*Restriction(s):* FOOD\*4100, FOOD\*4700

## Food, Agriculture and Resource Economics

*Department of Food, Agricultural and Resource Economics*

### **FARE\*1100 Introduction to Business W (3-0) [0.50]**

This course provides an overview as well as a foundation in the fundamentals of business management. The basic functions of business and management to be examined include: operations, human resources, marketing, finance, and strategic management. Small Business and entrepreneurship are also studied, along with other forms of business ownership, competition within a global economy, and the political and economic realities of business in Canada today. Students will develop basic competencies in business management through assignments and case studies requiring the practice of learned theory.

*Equate(s):* AGECE\*1100 , BADM\*1000

*Restriction(s):* Registration in BBRM.

### **FARE\*1300 Poverty, Food & Hunger W (3-0) [0.50]**

This course examines the nature of poverty, food security and hunger at both the local and global levels. In so doing, it explores the nature of international development more broadly and its relevance to students studying a wide range of disciplines. It aims to provide students with the basic concepts and analytical tools required to reflect critically on international development issues in the world today and the how global poverty, food insecurity and hunger might be alleviated.

*Equate(s):* AGECE\*1300

### **FARE\*2050 Markets for Molecules W (3-0) [0.50]**

This course explores markets and value chains for products and processes embodying new molecules and compounds. Economic, social and regulatory dimensions are considered in the context of molecular innovation and commercialization. Attention focuses on the role, importance and impact of consumers, entrepreneurs, government and international agencies in shaping these markets and value chains.

*Prerequisite(s):* 5.00 credits

*Equate(s):* AGECE\*2050

### **FARE\*2410 Agrifood Markets and Policy W (3-0) [0.50]**

Students will be provided with an introduction to agrifood markets, policies and institutions. Focus will be placed on: the role and function of futures markets; domestic agrifood policies; and agrifood trade policies, instruments and institutions. Economic analysis of contemporary issues in agrifood markets will be emphasized.

*Prerequisite(s):* AGR\*2400

*Co-requisite(s):* ECON\*2310

*Equate(s):* AGECE\*2410

*Restriction(s):* AGR\*2402

### **FARE\*2700 Survey of Natural Resource Economics F (3-0) [0.50]**

This course examines how humans, within a society, allocate natural resources - e.g., water, land, forests, and fisheries. Economic concepts and methods provide the basis for discussing and understanding both the use and misuse of natural resources.

*Prerequisite(s):* ECON\*1050

*Equate(s):* AGECE\*2700

### **FARE\*3030 The Firm and Markets F (3-1) [0.50]**

A course in microeconomic theory applied to agricultural economics research. The theory of the firm is used to analyze production and resource use in agriculture. Resource allocation issues, risk responsive decision-making, and firm strategy on vertical and horizontal integration are studied. Consumer theory is used to analyze food purchase decision. How theoretical relationships are quantified and used in the analysis of public policy issues is emphasized.

*Prerequisite(s):* ECON\*2310, ECON\*2770, ECON\*3740

*Equate(s):* AGECE\*3030

### **FARE\*3170 Cost-Benefit Analysis W (3-0) [0.50]**

This course covers the principles and applications of cost-benefit analysis (CBA) in environmental and natural resource issues. This course will present basic concepts and principles, supplemented with case studies of projects applying CBA to illustrate the different issues arising from the use of the CBA technique. Quantitative exercises involving analysis of actual environmental and natural resource data will be used to illustrate the mechanics of established valuations methods such as contingent valuation, hedonic approach and travel cost approach.

*Prerequisite(s):* 1 of AGECE\*2700 , FARE\*2700, ECON\*2100, ECON\*2310

*Equate(s):* AGECE\*3170

### **FARE\*3250 Food, Nutrition & International Development F (3-0) [0.50]**

This course aims to provide students with an economic perspective on issues in international development related to food and nutrition, exploring the ways in which economic analysis can enhance understanding of processes of international development in the contemporary world with a particular focus on food and nutrition. Students are encouraged to consider critically an economic approach to the analysis of development issues related to food and nutrition, alongside the perspectives of other social science disciplines. Throughout the course, food and nutrition as development issues are considered in the global context, especially related to trade.

*Prerequisite(s):* ECON\*1050, (1 of AGECE\*1300 , FARE\*1300, ECON\*1100)

*Equate(s):* AGECE\*3250

### **FARE\*3310 Operations Management F,W (3-0) [0.50]**

The decision-making role of the operations manager in transforming inputs into desired outputs is the primary focus of this course. The major issues and problems of designing, scheduling, operating, and controlling the production system will be examined.

*Prerequisite(s):* 1 of ACCT\*2220, AGECE\*2220 , BUS\*2220

*Equate(s):* AGECE\*3310

*Restriction(s):* Priority Access course. Enrolment may be restricted to particular programs or specializations. See department for more information.

### **FARE\*3400 Agribusiness Financial Management F (3-0) [0.50]**

The course will focus on the application of principles and tools of finance to managerial problems in agribusiness, food and resource industries. The focus is on evaluating and controlling profitability, growth, risks, and liquidity in agribusiness firms. Key concepts covered in the course include, credit, leverage, capital budgets, and capital costs. These concepts are applied using financial analysis and developed in the context of farming and agribusiness. The course also examines how and from whom farmers and agribusinesses obtain loans.

*Prerequisite(s):* 1 of ACCT\*2230, AGECE\*2230 , BUS\*2230

*Equate(s):* AGECE\*3400

*Restriction(s):* Registration in B.Comm. AGBU, AGBU Co-op, B.Sc.(Agr.) AGECE or B.A. AGECE.

### **FARE\*4000 Agricultural and Food Policy W (3-0) [0.50]**

A critical analysis of agricultural income, marketing, adjustment and trade problems and policies in the developed countries, with particular emphasis on Canadian agricultural policies.

*Prerequisite(s):* 15.00 credits including ECON\*2310

*Equate(s):* AGECE\*4000

### **FARE\*4210 World Agriculture and Economic Development F (3-0) [0.50]**

The role of agriculture in economic development. Analyses of economic policies and programs in developing countries and their effect on economic development.

*Prerequisite(s):* 10.00 credits including ECON\*1050 and ECON\*1100

*Equate(s):* AGECE\*4210

### **FARE\*4220 Advanced Agribusiness Management W (2-3) [0.50]**

This course is oriented toward practical application of theory and analytical principles to the identification, analysis and solution of an agribusiness organization/management problems. Students work on a major agribusiness project as management consultants with an owner/operator. The course builds upon students' prior training in accounting, finance, mathematical analysis, computer applications, economics, agriculture and management.

*Prerequisite(s):* 1 of AGECE\*2410 , FARE\*2410, AGECE\*3320 , AGR\*2402 , BUS\*3320, ECON\*2770

*Equate(s):* AGECE\*4220

### **FARE\*4240 Futures and Options Markets W (3-0) [0.50]**

An introduction to the study of the theory and application of futures, options and other derivative instruments for marketing, hedging, investment and speculative purposes. Emphasis is placed on applications of agricultural and financial instruments to real business situations.

*Prerequisite(s):* 1 of AGECE\*2410 , FARE\*2410, AGECE\*3320 , AGR\*2402 , BUS\*3320, ECON\*3560, ECON\*3660

*Equate(s):* AGECE\*4240

### **FARE\*4290 Land Economics F (3-0) [0.50]**

The economics of property rights is applied to issues in the allocation of land among agricultural, urban and other uses: contemporary trends, problems and policies in land planning, including expropriation and regulatory takings, soil erosion policy, farmland protection policy, endangered species policy and landfills and recycling. (Offered in even-numbered years.)

*Prerequisite(s):* 1 of AGECE\*2700 , FARE\*2700, ECON\*2310

*Equate(s):* AGECE\*4290

**FARE\*4310 Resource Economics W (3-0) [0.50]**

This course explores the role of property rights and related institutions in natural resource stewardship. Potential applications of this perspective to natural resource policy, both in Canada and internationally, are considered. Classes use a discussion based approach. The learning objective for the course is the development of critical thinking skills. The readings emphasize original sources. Students are expected to conduct original research on some aspect of the role of property rights and related institutions in the resolution of a current natural resource stewardship problem.

*Prerequisite(s):* 1 of AGE\*2700 , FARE\*2700, ECON\*2310, ECON\*2100

*Equate(s):* AGE\*4310

**FARE\*4360 Marketing Research W (3-0) [0.50]**

A study of the marketing research function in business with emphasis on its role in providing information to assist managers in making marketing decisions.

*Prerequisite(s):* 0.50 credits in statistics

*Equate(s):* AGE\*4360

**FARE\*4370 Food & Agri Marketing Management F (3-0) [0.50]**

The course focuses on the decision making role of the marketing manager who is responsible for formulating the strategic marketing plan for food and agricultural businesses. The theory of selecting market target(s) for the firm's product and/or services and the development of the marketing mix (product, price, promotion, distribution) with the aid of market research is covered. Note: Students with credit for this course may not proceed to MCS\*1000.

*Prerequisite(s):* 10.00 credits including (1 of ACCT\*2230, AGE\*2230 , BUS\*2230 , COST\*2600 , MCS\*2600)

*Equate(s):* AGE\*4370 , MCS\*4370

*Restriction(s):* Priority Access course. Enrolment may be restricted to particular programs or specializations. See department for more information.

**FARE\*4500 Decision Science F (3-0) [0.50]**

Quantitative techniques such as classical optimization, mathematical programming, simulation and input-output models are applied to firm, interregional, industry, and international problem situations in agricultural economics, including those dealing with resources and the environment. Time and risk and uncertainty dimensions are addressed.

*Prerequisite(s):* ECON\*2770

*Equate(s):* AGE\*4500

**FARE\*4550 Independent Studies I S,F,W (3-0) [0.50]**

A project based independent study course for majors in Agricultural Economics (of the Bachelor of Arts or Bachelor of Science in Agriculture degree programs), Agribusiness (of the Bachelor of Commerce degree program), and Environmental Economics and Policy (of the Bachelor of Science in Environmental Sciences degree program).

*Prerequisite(s):* 10.00 credits including 1 of AGE\*2410 , AGE\*2700 , AGR\*2401/2 , FARE\*2410, FARE\*2700,

*Equate(s):* AGE\*4550

*Restriction(s):* Permission of the instructor and Chair of the Department of Food, Agriculture and Resource Economics is required.

**FARE\*4560 Independent Studies II S,F,W (3-0) [0.50]**

An opportunity to conduct a second independent study project for majors in Agricultural Economics (of the Bachelor of Arts or Bachelor of Science in Agriculture degree programs), Agribusiness (of the Bachelor of Commerce degree program), and Environmental Economics and Policy (of the Bachelor of Science in Environmental Sciences degree program).

*Prerequisite(s):* 10.00 credits including 1 of AGE\*2410 , AGE\*2700 , AGR\*2401/2 , FARE\*2410, FARE\*2700,

*Equate(s):* AGE\*4560

*Restriction(s):* Permission of the instructor and Chair of the Department of Food, Agriculture and Resource Economics is required.

## French Studies

### *School of Languages and Literatures*

*The School reserves the right to determine the appropriate level to be taken by students enrolling in language courses. f , Literary texts are, at all levels, studied in French. Students registering in these courses will be expected to have the appropriate language proficiency.*

Francophone students will not normally be admitted into FREN\*1200 and FREN\*2030. It is recommended they start their program with FREN\*2020, FREN\*2060, FREN\*2500, or FREN\*2520 with the approval of the Faculty Advisor.

<b>FREN*1090 Basic French: Reading S,F (3-0) [0.50]</b>	
This is a basic course in French grammar and reading for students, who have up to Ontario Grade 9 French (or equivalent) but not above. FREN*1090 cannot be counted toward a specialization in French. (Offered through Distance Education only.)	
<i>Restriction(s):</i>	Students with native or near-native ability in French, including Francophones and French immersion students, will not be admitted to this course. Instructor consent required to verify student's level.
<b>FREN*1100 Basic French: Listening F,W (3-0) [0.50]</b>	
This basic course in French grammar will emphasize listening skills for students, who have up to grade 10 French (or equivalent) but not above. FREN*1100 cannot be counted toward a specialization in French. (Offered through Distance Education only.)	
<i>Restriction(s):</i>	Students with native or near-native ability in French, including Francophones and French immersion students, will not be admitted to this course. Instructor consent required to verify student's level.
<b>FREN*1120 Basic French: Writing W (3-0) [0.50]</b>	
This basic course in French grammar will emphasize writing skills for students, who have up to Grade 11 French (or equivalent) but not above. FREN*1120 cannot be counted toward a specialization in French. (Offered through Distance Education only.)	
<i>Restriction(s):</i>	Students with native or near-native ability in French, including Francophones and French immersion students, will not be admitted to this course. Instructor consent required to verify student's level.
<b>FREN*1150 Elementary French F,W (3-0) [0.50]</b>	
This is a review course in French grammar, oral and written skills, for students who have Ontario Grade 11 French or equivalent but not above. FREN*1150 cannot be counted toward a specialization in French.	
<i>Equate(s):</i>	FREN*1110
<i>Restriction(s):</i>	Students with native or near-native ability in French, including Francophones and French immersion students, will not be admitted to this course.
<b>FREN*1200 French Language I F,W (3-1) [0.50]</b>	
A first year, university-level course for students graduating with a high-school background in core French. Students will practise written and oral French.	
<i>Prerequisite(s):</i>	1 of FREN*1150, Grade 12U French or permission of the School
<i>Restriction(s):</i>	Students with native or near-native ability in French, including Francophones and French immersion students, will not be admitted to this course.
<b>FREN*2020 France: Literature and Society F,W (3-1) [0.50]</b>	
An historical introduction to French life and thought as seen through literature and art. Lectures and small seminars are integrated into a multi-media presentation including videotapes, slides and audio tapes.	
<i>Prerequisite(s):</i>	FREN*1200 or FREN*2030
<b>FREN*2030 French Language II F,W (3-1) [0.50]</b>	
This is a continuation of French Language I with further practice in written and oral French, grammar, vocabulary acquisition, translation, laboratory exercises and discussion groups.	
<i>Prerequisite(s):</i>	1 of FREN*1200, Grade 12U, French Immersion or permission of the School.
<i>Restriction(s):</i>	Students with native ability in French will not be admitted to this course.
<b>FREN*2060 Quebec: Literature and Society F,W (3-1) [0.50]</b>	
An historical introduction to Quebec life and thought from New France to the present as seen through literature and art. Lectures and small seminars are integrated into a multi-media presentation including videotapes, slides and audio tapes.	
<i>Prerequisite(s):</i>	FREN*1200 or FREN*2030
<b>FREN*2500 French Translation I S,W (3-0) [0.50]</b>	
An introduction to the art and techniques of French-English translation. (Also offered through Distance Education format.)	
<i>Prerequisite(s):</i>	FREN*2030

<b>FREN*2520 French Composition I F (3-0) [0.50]</b>
Essay writing and textual analysis.
<i>Prerequisite(s):</i> FREN*2030
<b>FREN*2540 Spoken French: Theory and Practice W (3-0) [0.50]</b>
This course focuses on the differences between written and spoken French and is designed to help students function efficiently in an oral French context (comprehension and expression).
<i>Prerequisite(s):</i> FREN*2030
<i>Restriction(s):</i> Students with native or near-native ability in French, including Francophones and French immersion students will not be admitted to this course.
<b>FREN*3000 Romanticism &amp; Realism in France W (3-0) [0.50]</b>
This course is a seminar on the 19th-century novel emphasizing themes and ideas which have contributed to contemporary literature and thought.
<i>Prerequisite(s):</i> FREN*2020, FREN*2030
<b>FREN*3010 Twentieth-Century French Novel W (3-0) [0.50]</b>
A changing world as perceived by 20th-century writers in France. From Gide to post-modernism, the impact of renewed scientific perspectives on literature, and the questioning of modes of representation, signs and society. (Offered in even-numbered years.)
<i>Prerequisite(s):</i> FREN*2020, FREN*2030
<b>FREN*3080 Pre-Revolution French Literature W (3-0) [0.50]</b>
This course introduces students to the intellectual history of France, its society and institutions, through major works of literature published before the French Revolution.
<i>Prerequisite(s):</i> FREN*2020, FREN*2030
<i>Restriction(s):</i> FREN*3070 , FREN*3240 , FREN*4050
<b>FREN*3120 Contemporary Francophone Theatre W (3-0) [0.50]</b>
This course offers a selective study of recent play-scripts written in French. Students are advised to consult the web description for the particular focus of the current offering. (Offered in odd-numbered years.)
<i>Prerequisite(s):</i> FREN*2020, FREN*2030, FREN*2060
<i>Restriction(s):</i> FREN*3020 , FREN*3210
<b>FREN*3200 Quebec Novel F (3-0) [0.50]</b>
A survey of representative Quebec novels from World War II to the Quiet Revolution. A seminar and lecture course.
<i>Prerequisite(s):</i> FREN*2030, FREN*2060
<b>FREN*3230 The Structure of French F (3-0) [0.50]</b>
Elements of the sound system, grammar and vocabulary of contemporary French.
<i>Prerequisite(s):</i> FREN*2030
<b>FREN*3500 French Translation II F (3-0) [0.50]</b>
Contrastive grammar (French and English). Analysis of various styles and their application to written translation. Small discussion groups.
<i>Prerequisite(s):</i> FREN*2030, FREN*2500
<b>FREN*3520 French Composition II W (3-0) [0.50]</b>
A continuation of FREN*2520 with special emphasis on stylistics.
<i>Prerequisite(s):</i> FREN*2030, FREN*2520
<b>FREN*3530 Business French F (3-0) [0.50]</b>
This course is a detailed study of the French language as it is currently used in administration and business, both in France and Quebec. It will cover areas such as advertising, administrative reports, employment, communication and levels of language. (Offered in odd-numbered years.)
<i>Prerequisite(s):</i> FREN*2030
<b>FREN*3610 Studies in French Literature and Culture in Nice F,W (3-0) [0.50]</b>
Thematic courses relating to the literature, arts, and society of metropolitan France and of the Francophone world. Options may include other languages, literatures, and other disciplines in the arts and social sciences. For Nice students only.
<i>Prerequisite(s):</i> 1 of FREN*2020, FREN*2030, FREN*2060
<i>Restriction(s):</i> Admission to Nice Program.
<b>FREN*3620 Studies in French Literature and Culture in Nice F,W (3-0) [0.50]</b>
Thematic courses relating to the literature, arts, and society of metropolitan France and of the Francophone world. Options may include other languages, literatures, and other disciplines in the arts and social sciences. For Nice students only.
<i>Prerequisite(s):</i> 1 of FREN*2020, FREN*2030, FREN*2060
<i>Restriction(s):</i> Admission to Nice Program.

**FREN\*3630 Studies in French Literature and Culture in Nice F,W (3-0) [0.50]**

Thematic courses relating to the literature, arts, and society of metropolitan France and of the Francophone world. Options may include other languages, literatures, and other disciplines in the arts and social sciences. For Nice students only.

*Prerequisite(s):* 1 of FREN\*2020, FREN\*2030, FREN\*2060

*Restriction(s):* Admission to Nice Program.

**FREN\*3640 Studies in French Literature and Culture in Nice F,W (3-0) [0.50]**

Thematic courses relating to the literature, arts, and society of metropolitan France and of the Francophone world. Options may include other languages, literatures, and other disciplines in the arts and social sciences. For Nice students only.

*Prerequisite(s):* 1 of FREN\*2020, FREN\*2030, FREN\*2060

*Restriction(s):* Admission to Nice Program.

**FREN\*3650 Studies in French Literature and Culture in Nice F,W (3-0) [0.50]**

Thematic courses relating to the literature, arts, and society of metropolitan France and of the Francophone world. Options may include other languages, literatures, and other disciplines in the arts and social sciences. For Nice students only.

*Prerequisite(s):* 1 of FREN\*2020, FREN\*2030, FREN\*2060

*Restriction(s):* Admission to Nice Program.

**FREN\*3660 Studies in French Literature and Culture in Nice F,W (3-0) [0.50]**

Thematic courses relating to the literature, arts, and society of metropolitan France and of the Francophone world. Options may include other languages, literatures, and other disciplines in the arts and social sciences. For Nice students only.

*Prerequisite(s):* 1 of FREN\*2020, FREN\*2030, FREN\*2060

*Restriction(s):* Admission to Nice Program.

**FREN\*3670 Studies in French Literature and Culture in Nice F,W (3-0) [0.50]**

Thematic courses relating to the literature, arts, and society of metropolitan France and of the Francophone world. Options may include other languages, literatures, and other disciplines in the arts and social sciences. For Nice students only.

*Prerequisite(s):* 1 of FREN\*2020, FREN\*2030, FREN\*2060

*Restriction(s):* Admission to Nice Program.

**FREN\*3680 Studies in French Literature and Culture in Nice F,W (3-0) [0.50]**

Thematic courses relating to the literature, arts, and society of metropolitan France and of the Francophone world. Options may include other languages, literatures, and other disciplines in the arts and social sciences. For Nice students only.

*Prerequisite(s):* 1 of FREN\*2020, FREN\*2030, FREN\*2060

*Restriction(s):* Admission to Nice Program.

**FREN\*3690 Studies in French Literature and Culture in Nice F,W (3-0) [0.50]**

Thematic courses relating to the literature, arts, and society of metropolitan France and of the Francophone world. Options may include other languages, literatures, and other disciplines in the arts and social sciences. For Nice students only.

*Prerequisite(s):* 1 of FREN\*2020, FREN\*2030, FREN\*2060

*Restriction(s):* Admission to Nice Program.

**FREN\*4220 Recent Quebec Writing W (3-0) [0.50]**

This course analyses representative contemporary Quebec novels, short stories and poems from aesthetic, thematic and ideological points of view. (Offered in even-numbered years.)

*Prerequisite(s):* FREN\*2030, FREN\*2060

*Restriction(s):* FREN\*3220

**FREN\*4290 Post-Colonial Francophone Fiction F (3-0) [0.50]**

This course is an advanced introduction to selected works of 20<sup>th</sup>-century Francophone writers from Maghreb, Black Africa and the Caribbean. (Offered in even-numbered years.)

*Prerequisite(s):* FREN\*2020, FREN\*2030

*Restriction(s):* FREN\*3290

**FREN\*4300 Symbolist and Surrealist Poetry F (3-0) [0.50]**

The French Symbolists of the 19th century and the 20th century Surrealist poets' vision of the world will be discussed. (Offered in even-numbered years.)

*Prerequisite(s):* FREN\*2020, FREN\*2030, FREN\*3520

**FREN\*4500 The French Language in Canada W (3-0) [0.50]**

A descriptive, historical and socio-linguistic study of the varieties of French spoken in Canada, with particular emphasis on Quebec. (Offered in odd-numbered years.)

*Prerequisite(s):* FREN\*2030, FREN\*3230

**FREN\*4600 Honours Seminar in French and Quebecois Studies F (3-0) [0.50]**

This course is a seminar on literary genres, movements and themes, or on the French language. (Offered in odd-numbered years.)

*Prerequisite(s):* FREN\*2020, FREN\*2030, FREN\*2060, FREN\*3520

**FREN\*4610 Honours Seminar in French and Quebecois Studies F (3-0) [0.50]**

Seminar on literary genres, movements and themes. (Offered in even-numbered years.)

*Prerequisite(s):* FREN\*2020, FREN\*2030, FREN\*2060, FREN\*3520

**FREN\*4740 Research Paper in French Studies I S,F,W (3-0) [0.50]**

A research paper in French on an approved topic in French literature or language will be required. Individual attention will be given to methods of research and techniques of writing. This course is intended to serve as an introduction to future research at the M.A. and Ph.D. levels.

*Prerequisite(s):* FREN\*2020, FREN\*2030, FREN\*2060, FREN\*3520. 70% average in all French Studies course attempts is required, although at least 75% is recommended.

*Restriction(s):* Instructor consent required.

**FREN\*4750 Creative Writing in French S,F,W (3-0) [0.50]**

The development and revision of a major work of creative writing in French (fiction, poetry, or drama), under the supervision of a faculty member will be required.

*Prerequisite(s):* (FREN\*2020 or FREN\*2060), FREN\*2030, FREN\*3520, FREN\*4740. 70% average in all French Studies course attempts is required, although at least 75% is recommended.

*Restriction(s):* Instructor consent required.

**FREN\*4770 Research Paper in French Studies II S,F,W (3-0) [0.50]**

A research paper in French on an approved topic in French literature or language will be required. Individual attention will be given to methods of research and techniques of writing. This course is intended to serve as an introduction to future research at the M.A. and Ph.D. levels.

*Prerequisite(s):* FREN\*2020, FREN\*2030, FREN\*2060, FREN\*3520, FREN\*4740. 70% average in all French Studies course attempts is required, although at least 75% is recommended.

*Restriction(s):* Instructor consent required.

**FREN\*4900 Applied Linguistics: French Studies W (3-0) [0.50]**

A course specially designed for future teachers of French, in which the principles of linguistics are applied to the teaching of French. (Offered in even-numbered years.)

*Prerequisite(s):* FREN\*2030, (1 of FREN\*3230, LING\*1000 or permission of the department)

## Geography

### Department of Geography

*Students majoring in other departments may take a number of Geography courses without the prerequisites listed below if they obtain the permission of the instructor.*

**Note: Several courses in Geography are listed as acceptable for the Natural and Mathematical Science B.A. Distribution Requirements or as Non-Science Electives for B.Sc. students.**

*For courses without a semester designation, or with an alternate year designation, please check with the department.*

<b>GEOG*1200 Society and Space F,W (3-0) [0.50]</b>
This course introduces key concepts in contemporary Human Geography. The course applies a spatial perspective in exploring a wide ranging series of processes and issues in society. Topics include population growth and migration, models and challenges of urban and rural development, interpretation of cultural landscapes and selected issues relating to social welfare. (Also offered through Distance Education format.)
<b>GEOG*1220 Human Impact on the Environment F,W (3-0) [0.50]</b>
A global overview of the changing relationships among society, technology and the environment. This course emphasizes the major stages of human use of resources and the environmental consequences of global changes in production systems. It contrasts Third and First World experiences, focusing on core-periphery relationships. (Also offered through Distance Education format.)
<b>GEOG*1300 Introduction to the Biophysical Environment F,W (3-2) [0.50]</b>
An introduction to Physical Geography. The principles and processes governing climate-landform-soil-vegetation systems and interrelationships. Natural and human-induced changes to environmental systems. Laboratories will address techniques of measurement, representation and analysis of environmental systems through maps, air photographs, remote sensing and field observations. (Also offered through Distance Education format.)
<i>Restriction(s):</i> GEOG*1350
<b>GEOG*1350 Earth: Hazards and Global Change F,W (3-0) [0.50]</b>
An introduction to the principles and processes governing climate-landform-soil-vegetation systems. Emphasis is placed on the interrelationships between human and environmental systems through the examination of natural hazards and global climate change.
<i>Restriction(s):</i> GEOG*1300
<b>GEOG*2000 Geomorphology F (3-2) [0.50]</b>
This is an introduction to geomorphology emphasizing weathering, slope and fluvial processes within drainage basins, and glacial and periglacial processes. Field and laboratory techniques will be applied.
<i>Prerequisite(s):</i> 1 of GEOG*1300, GEOG*1350, GEOL*1050, GEOL*1100
<b>GEOG*2030 Political Ecology &amp; Geography F (3-0) [0.50]</b>
This course examines the changing world political map and relations between society and ecology from the perspective of intra- and inter-state structures and processes. Territorial restructuring, international law, environmental movements, localization and globalization are considered. Particular attention is paid to ecological and development processes and strategies in various parts of the world.
<i>Prerequisite(s):</i> 5.00 credits, GEOG*1220 is recommended
<b>GEOG*2110 Climate and the Biophysical Environment W (3-1) [0.50]</b>
The interrelationships between the atmosphere, lithosphere, hydrosphere, and biosphere to produce distinct physical landscapes (climates, soils, vegetation). Emphasis on the role of climate and the flows of energy, water, and biogeochemicals.
<i>Prerequisite(s):</i> GEOG*1300 or GEOG*1350
<b>GEOG*2210 Environment and Resources W (3-0) [0.50]</b>
This course examines the interrelationships between people and biophysical processes. The main themes are: 1) characteristics of natural resources and processes through which they are developed and used and 2) human response to environmental conditions, including natural hazards and global change. Contemporary Canadian case studies will be presented at the regional and national scales. (Also offered through Distance Education format.)
<i>Prerequisite(s):</i> GEOG*1220 is recommended
<b>GEOG*2230 Economic Geography F (3-0) [0.50]</b>
An introduction to the spatial distribution of economic activity. The course examines patterns, processes and problems in extractive activities, manufacturing, marketing and the service sector, including the transportation of commodities and people. The principles of economic location are applied to regional economic analysis and development.
<i>Prerequisite(s):</i> GEOG*1200

<b>GEOG*2260 Applied Human Geography W (3-2) [0.50]</b>
This course introduces students to the geographical research process, guiding them through key methodological issues and techniques in human geography. The lab component of the course focuses on data collection using secondary documents, surveys, interviews, and participant observation, as well as both quantitative and qualitative analysis techniques. Lab assignments and class illustrations draw on a range of topics in human geography.
<i>Prerequisite(s):</i> GEOG*1200 or (ANTH*1150 and GEOG*1220)
<b>GEOG*2420 The Earth From Space F (2-3) [0.50]</b>
This course provides an introduction to the principles and techniques of air photo and satellite image interpretation. Topics include stereoscopic viewing, parallax, flightline planning, and mapping from air photos. Lab exercises focus on specific applications in natural habitats and in rural and urban settings.
<i>Prerequisite(s):</i> 0.50 credits in geography and/or earth science
<b>GEOG*2460 Analysis in Geography F (3-2) [0.50]</b>
The application of modern techniques to geographic study. The interpretation of geographic phenomena by objective methods. Major honours students in Geography must complete this course by the end of semester 4.
<i>Prerequisite(s):</i> 0.50 credits at the 1000 level in Geography
<b>GEOG*2480 Mapping and GIS F,W (3-2) [0.50]</b>
An introduction to the theory and techniques of manipulating and displaying spatial data in a GIS (Geographic Information System). Mapping concepts such as scale, co-ordinate systems, map projections, symbolization and vector data encoding are introduced. Major honours students in Geography must complete this course by the end of semester 4.
<i>Prerequisite(s):</i> 5.00 credits
<b>GEOG*2510 Canada: A Regional Synthesis W (3-0) [0.50]</b>
This course is designed to provide a better understanding of the nature and basis of Canadian regionalism. The first section of the course stresses the biophysical base and the inequality of the natural resource endowment. The historical geographic approach and the systematic overviews of contemporary Canada stress respectively the development and nature of the Canadian space-economy. The final section on regions, regionalism and nationalism provides an overview of the heartland-hinterland dichotomy and centrifugal and centripetal forces operative in the nation.
<b>GEOG*3000 Fluvial Processes F (3-2) [0.50]</b>
This course examines processes and landforms associated with rivers. Particular emphasis is placed on the interaction between water and sediment movement and channel morphology. Case studies of human impact on river systems are presented.
<i>Prerequisite(s):</i> GEOG*2000, (GEOG*2460 or STAT*2040)
<b>GEOG*3020 Global Environmental Change F (3-1) [0.50]</b>
Major global environmental issues examined include climate change, deforestation, desertification and global fisheries. This course is interdisciplinary, exploring the interactions of bio-physical processes with human socio-economic dynamics, including policy initiatives. Particular attention is given to global climate change, its causes, its nature and extent, its implications for ecosystems and societies, and its governance implications. (Also offered through Distance Education format.)
<i>Prerequisite(s):</i> 7.50 credits, (GEOG*2210 recommended)
<b>GEOG*3050 Development and the City W (3-0) [0.50]</b>
This course examines different theoretical and policy perspectives of urbanization and urban development, as well as social, economic and environmental living conditions in cities of the global "south". It refers to concrete examples of cities in their national and international context, paying due attention to diversity and the fluidity of urban-rural boundaries. Specific urban development issues, including migration, housing, employment, health and environment are also addressed.
<i>Prerequisite(s):</i> 7.50 credits, (GEOG*2030 and GEOG*2260 recommended)
<b>GEOG*3090 Gender and Environment F (3-0) [0.50]</b>
This course introduces feminist scholarship and perspectives to explore men and women's experiences with both the natural and built environment. The course draws on case studies from developing and developed countries to demonstrate the importance of gender difference in understanding human interactions with the environment. Students will observe gendered use, access, knowledge, responsibility and control in rural and urban landscapes.
<i>Prerequisite(s):</i> 7.50 credits, (GEOG*2210 and GEOG*2260 recommended)
<b>GEOG*3110 Biotic and Natural Resources F (2-2) [0.50]</b>
This course focuses on the ecological basis for resource management, evaluates a number of current ecological theories and addresses their implications for resource management.
<i>Prerequisite(s):</i> (GEOG*2460 or STAT*2040), (1 of BIOL*2060, BOT*2050, ENVB*2030, GEOG*2110)



**GEOG\*3210 Management of the Biophysical Environment F (3-0) [0.50]**

This course provides an examination of resource management, focusing on public and private decision-making processes and considers techniques for evaluating resources, including Environmental Impact Assessment (EIA) and risk analysis. Emphasis is on the economic, social and environmental implications of resource development and use. Contemporary Canadian case studies will be presented at appropriate scales. (Also offered through Distance Education format).

*Prerequisite(s):* 7.50 credits including (ENVS\*2150 or GEOG\*2210)

**GEOG\*3320 Agriculture and Society F (3-0) [0.50]**

This course adopts a geographical perspective in exploring the structure and functioning of agriculture and food systems in contemporary society. Particular attention is paid to the interaction of farms with the social, economic, institutional and environmental forces that combine to shape local types and regional patterns of agricultural activity. The concept of sustainability is used as an integrating theme for the consideration of selected issues.

*Prerequisite(s):* 7.50 credits

**GEOG\*3420 Remote Sensing of the Environment W (2-3) [0.50]**

This course explores the nature and acquisition of remotely sensed imagery, and provides students with the technical expertise required to process and interpret this type of digital data. The application of digital image processing techniques to analyzing geographic problems is stressed, and its integration in a Geographic Information Systems (GIS) environmental is demonstrated.

*Prerequisite(s):* 10.00 credits including GEOG\*1300

**GEOG\*3480 GIS and Spatial Analysis F,W (3-2) [0.50]**

This course focuses on the use of raster and vector-based geographic information systems to analyze spatial data. Topics include map digitizing, data query and overlay, spatial interpolation, multi-criteria evaluation, least cost pathway determination and digital elevation models. This course requires some familiarity with numerical methods and computer operations.

*Prerequisite(s):* 10.00 credits, including GEOG\*2480

**GEOG\*3490 Tourism and Environment W (3-0) [0.50]**

An integrative perspective on tourism, addressing diverse interactions between people and tourist resources. Emphasis is on experiences derived from the use of resources, the environmental, economic and cultural impacts of tourism, and approaches to managing these impacts. (Also offered through Distance Education format.)

*Prerequisite(s):* 7.50 credits

**GEOG\*3600 Geography of a Selected Region U (3-0) [0.50]**

The study of an area which will include topics in physical, economic, social and historical aspects of geography.

*Prerequisite(s):* 7.50 credits

**GEOG\*3610 Environmental Hydrology W (3-1) [0.50]**

An introductory course in hydrology, the study of water in the environment. Emphasis is placed on understanding and modeling the hydrologic cycle. Topics include hydrologic processes, water resources, and case studies of freshwater systems.

*Prerequisite(s):* 7.50 credits, (GEOG\*2460 or STAT\*2040), (1 of GEOG\*2000, GEOG\*2110, or another 2000 level earth science or engineering science course is recommended)

**GEOG\*4110 Environmental Systems Analysis F (3-6) [1.00]**

An integrated systems approach to solving issues of environmental evaluation, impact and development. Focus will be on the biophysical components of the environment.

*Prerequisite(s):* GEOG\*3110 or GEOG\*3610

**GEOG\*4150 Sedimentary Processes W (3-2) [0.50]**

This course examines the basic properties and flow characteristics of fluids that control the entrainment and transport of sediment by air and water. Bedform development in fluvial, coastal and aeolian environments are also discussed in relation to fluid flow mechanics. Lectures are complemented by weekly labs using the wind tunnel, flume and wave tank.

*Prerequisite(s):* GEOG\*3000

**GEOG\*4200 Seminar in Urban Geography W (3-0) [0.50]**

Many of the traditional features of cities are changing in light of powerful forces of globalization. The course examines spatial patterns and processes of economic restructuring, social dynamics and political change in Canadian and non-Canadian cities. Students discuss and interpret evolving urban forms from a geographical perspective.

*Prerequisite(s):* GEOG\*2260, (GEOG\*3050 recommended)

*Restriction(s):* GEOG\*3400

**GEOG\*4210 Environmental Governance F (3-1) [0.50]**

This course provides an opportunity for advanced studies in resource and environmental governance. A central aim is developing an understanding of principles, practices and emerging issues relating to environmental governance.

*Prerequisite(s):* GEOG\*3210

**GEOG\*4220 Local Environmental Management W (3-0) [0.50]**

This course explores local environmental management from two perspectives: state-driven (where local government agencies or forums created by governments are used) and non-state driven (where local actors come together in new governance arrangements to undertake environmental management). Through comparing and contrasting these broad perspectives in an experiential learning setting, the course builds understanding of a key trend in environmental governance.

*Prerequisite(s):* GEOG\*3210

**GEOG\*4230 Environmental Impact Assessment W (3-0) [0.50]**

This course examines environmental impact assessment (EIA) from philosophical, methodological and institutional perspectives. The evolution of EIA in Canada will be the focus. Case studies illustrating major issues and applications will be presented at a variety of geographical scales. The preparation and presentation of a research project is an integral component.

*Prerequisite(s):* GEOG\*3210

*Equate(s):* ENVS\*4220

**GEOG\*4250 Coastal Processes F (3-2) [0.50]**

This course examines the geomorphic processes and associated landforms found in the coastal zone. Initially the focus is on developing an understanding of the major controls on coastal erosion and sediment transport, including waves, nearshore currents and water level fluctuations. This is followed by the study of features and processes in selected coastal environments such as beaches, barrier islands and spits, coastal sand dunes and bluff coasts. In each case applications to problems of coastal management are introduced.

*Prerequisite(s):* 1 of GEOG\*3000, GEOG\*3610, GEOG\*3620

**GEOG\*4390 Seminar in Rural Geography F (3-0) [0.50]**

This course surveys themes and issues in contemporary rural geography. Specific attention is given to the processes of restructuring and change in rural systems in Canada and other developed economies. Themes include transformations in the use of rural land, the new rural economy, restructuring in service delivery, and the sustainability of rural communities and systems.

*Prerequisite(s):* GEOG\*2260, GEOG\*3320

**GEOG\*4480 Applied Geographic Information Systems W (3-6) [1.00]**

This course adopts a project-oriented approach to the application of Geographic Information Systems (GIS) in spatial analysis. Students will have the opportunity to design and implement a research project using GIS techniques to investigate a problem in any area of Geography.

*Prerequisite(s):* GEOG\*3480

**GEOG\*4690 Geography Field Research F (3-6) [1.00]**

This course provides an opportunity for senior students to develop skills in the design, implementation and presentation of a field research project. The course involves a field trip of about 10-14 days, either in Canada or abroad. This component of the course takes place between the end of the summer session and the start of classes in the fall semester. Classes during the fall semester focus on the analysis and interpretation of data and incorporate student research seminars. Information on the location and cost of the field research course is available from the department in the winter semester prior to each fall offering.

*Prerequisite(s):* 12.50 credits

*Restriction(s):* Restricted to majors in Earth Surface Science, Environmental Geoscience and Geomatics, Environmental Governance, Geography and B.Sc.(Env.) with an overall average of at least 70% at the time of registration. Instructor consent required.

**GEOG\*4880 Contemporary Geographic Thought W (3-0) [0.50]**

A critical overview of the evolution and current status of Geography. Particular emphasis will be given to the variety of approaches and convergence and divergence within the discipline. The interaction between human and physical geographers and their approaches to issues and the subject will be analyzed.

*Restriction(s):* Restricted to major honours students in Geography at semester 6 or above.

**GEOG\*4990 Independent Study in Geography U (0-3) [0.50]**

The independent study option is designed to provide senior undergraduate students with an opportunity to pursue library or field research under faculty supervision and to prepare a research report. Formal agreement between the student and the faculty supervisor is required, as is approval of the department chair.

*Restriction(s):* Restricted to majors in Earth Surface Science, Environmental Geoscience and Geomatics, Environmental Governance, Geography and B.Sc.(Env.) with an overall average of at least 70% at the time of registration. Instructor consent required.

## Geology

### School of Environmental Sciences

#### GEOL\*1050 Geology and the Environment F (2-3) [0.50]

Geological materials, their origin, recognition and economic potential, use and location; oil and gas, coal, mineral deposits, aggregate resources, groundwater, Geological basis for environmental evaluation and land use. Emphasis on local and North American examples.

#### GEOL\*1100 Principles of Geology S,F,W (3-0) [0.50]

Introduction to geological principles, their historical development and application to interpreting Earth materials and processes. Suitable for those wishing a general knowledge of earth sciences. (Also offered through Distance Education format.)

*Restriction(s):* May not be taken for credit by students in B.Sc.(Env.) Earth and Atmospheric Science Major, or B.Sc. Degree program.

#### GEOL\*2020 Stratigraphy F (3-0) [0.50]

Principles of recognizing and interpreting earth surface environments using examples from geology, geomorphology and archeology. Brief summary of sediment identification, recognition of processes and environments. Section description and interpretation followed by principles of physical correlation and facies interpretation. Concepts of physical, biological and radiometric dating. Controls on stratigraphic sequence development - isostasy, eustasy and tectonics. Sedimentary basin development, interpretation and history including changes in atmosphere, hydrosphere and biosphere. (Offered in even-numbered years.)

*Prerequisite(s):* 1 of GEOL\*1050, GEOL\*1100, GEOG\*1300, GEOG\*1350 or equivalent

#### GEOL\*2110 Earth Material Science F (3-3) [0.50]

Minerals are the building blocks of rocks, and rocks are the basis of the earth's crust. The nature, classification and recognition of the common rocks and minerals and their chemical and physical transformations is dealt with. Emphasis is on the role that minerals and rocks play in determining the abiotic character of earth-surface environments.

*Prerequisite(s):* GEOL\*1050 or SOIL\*2200

#### GEOL\*2160 Glacial Geology W (3-0) [0.50]

Identical to GEOL\*2200 but without laboratory. Lectures taken with GEOL\*2200.

*Prerequisite(s):* 1 of AGR\*2320, GEOG\*1300, GEOL\*1050, GEOL\*1100, SOIL\*2010

*Restriction(s):* GEOL\*2150, GEOL\*2200

#### GEOL\*2200 Glacial Geology W (3-3) [0.50]

This course is designed to give students an introduction to the processes, landforms and deposits of glacial environments. This includes basic principles of glaciology, the landforms and deposits found in various glacial and periglacial environments, and the nature of past glaciations in Earth history. Ancient to recent glacial deposits from the Great Lakes region and other international locations will be examined. A field trip will be scheduled.

*Prerequisite(s):* 1 of AGR\*2301, AGR\*2320, GEOG\*1300, GEOL\*1050, GEOL\*1100, SOIL\*2010, SOIL\*2200

*Restriction(s):* GEOL\*2160, GEOL\*2150

#### GEOL\*2250 Geology of Natural Disasters S,W (3-0) [0.50]

This course will offer insight into the mechanisms of natural geological disasters and their effects on Planet Earth, human civilization and life in general. Events before, during and after geological disasters such as earthquakes, volcanic eruptions, meteorite impact and climate change will be the focus of this course. This course will not count as a science credit for B.Sc. students. (Offered through Distance Education format only.)

*Prerequisite(s):* 1 of GEOG\*1300, GEOG\*1350, GEOL\*1050, GEOL\*1100

#### GEOL\*3060 Groundwater W (3-0) [0.50]

This course provides a general understanding of the physical and chemical processes that operate in the groundwater zone under natural and human-induced conditions. The interrelations between the groundwater regime and the other components of the hydrological cycle are studied. Considerable emphasis is placed on the applied aspects of topics such as exploration, testing and development of aquifers for water supply, the chemical quality of groundwater, and the hydrogeological aspects of waste disposal.

*Prerequisite(s):* 1 of IPS\*1110, MATH\*1000, MATH\*1080, MATH\*1200 or Registration in B.B.R.M.

#### GEOL\*3090 Applied Structural Geology W (3-0) [0.50]

Systematic study of structural elements of the earth crust. Introduces concepts on the distribution, origin and structural development of the major landforms in North America and other continents (plate tectonics). The course provides examples of structural geology applied to engineering, environmental geology, and ore geology. Hands-on experience on deformation analysis, slope stability and interpretation of structures during the field trip and in classroom simulations.(Offered in odd-numbered years.)

*Prerequisite(s):* GEOL\*1050, suitable geomorphology credit

#### GEOL\*3190 Environmental Water Chemistry F (3-0) [0.50]

An examination of the chemical composition of both natural and contaminated waters at the earth's surface and the interaction of these waters with soils and sediments. The significance of these interactions will be studied with respect to the mobility of organic and metallic constituents in geochemical cycles and as contaminants in the environment.

*Prerequisite(s):* 1 of CHEM\*1010, CHEM\*1050, CHEM\*1310

#### GEOL\*3250 Field Methods in Geosciences F (2-2) [0.50]

This course is designed to provide experience in field methods and applied aspects of Earth surface science. The field camp portion will focus on geological mapping skills, while the rest of the term will be spent on developing a consulting proposal for a field-based project. Other topics covered will be project design, proposal writing, oral communication skills and ethics of field-based research. Students are required to notify the designated departmental instructor of their intention to participate in this course during the previous Winter semester. There will be a fee to cover partial costs in this course; students in financial need should approach the Director of the School of Environmental Sciences.

*Prerequisite(s):* GEOL\*1050, (GEOG\*2000 or ENVS\*2150), (GEOL\*2150 or GEOL\*2200)

*Restriction(s):* Instructor consent required.

#### GEOL\*4090 Sedimentology F (3-3) [0.50]

Origin, transport, deposition of sediments, and formation of sedimentary rocks. Emphasis will be on the interpretation of recent and ancient environments of deposition, and on the uses of sedimentary materials. Six laboratories will be scheduled as field trips. One Saturday field trip may be scheduled. (Offered in even-numbered years.)

*Prerequisite(s):* (1 of GEOL\*2020, GEOL\*2150, GEOL\*2200, equivalent), (0.50 credit at the 3000 level in the GEOG\*XXXX or GEOL\*XXXX grouping or equivalent)

#### GEOL\*4110 Topics in Earth Science F,W (3-0) [0.50]

Lecture-discussion or seminar on selected topics in Earth Science to be conducted by faculty with expertise in the area. Students should check with the department to determine what topic, if any, will be offered during specific semesters. Field trips will be scheduled as required.

*Prerequisite(s):* (GEOG\*1300 or GEOL\*1050), 0.50 credits at the 3000 level in a science appropriate to chosen topic

*Restriction(s):* Instructor consent required.

#### GEOL\*4130 Clay and Humic Chemistry W (3-2) [0.50]

This course is a study of the fundamental chemistry of clay minerals and humic substances in the environment, with particular reference to soils, sediments and waters. Emphasis will be placed on their structures and charge characteristics in the context of surface complexation modeling of proton binding and cation and anion adsorption. (Offered in even-numbered years.)

*Prerequisite(s):* SOIL\*3060 or GEOL\*3190

#### GEOL\*4240 Geomicrobiology F (3-0) [0.50]

This course focuses on understanding the role of microorganisms in shaping the solid surface of the Earth. This will include the major chemical and biochemical transformations by microorganisms in natural surface and subsurface environments. We will consider the contribution of microorganisms to crucial element cycles, including carbon, sulfur, and select metals, and ultimately to rock cycling. Aspects of early life on Earth, astrobiology, and environmental biotechnology will be included as appropriate. (Offered in odd numbered years.)

*Prerequisite(s):* [(BIOL\*1040 or MICR\*1020) or (2 of BIOL\*1070, BIOL\*1080, BIOL\*1090)], GEOL\*1050, 0.50 credits at the 3000 level in GEOL or MICR

*Restriction(s):* MICR\*4280, MICR\*4290

## German Studies

### *School of Languages and Literatures*

*NOTE: The School reserves the right to determine the appropriate level to be taken by students enrolling in language courses.*

#### **GERM\*1100 Introductory German I F,W (2-2) [0.50]**

A beginning course in German. Students will attain a basic knowledge of the language and practice all four language skills (listening, speaking, reading and writing). They will also learn about aspects of German culture. This course may not normally be taken by anyone who has Grade 12U German.

#### **GERM\*1110 Introductory German II F,W (3-1) [0.50]**

This course provides for an intensification of the four language skills introduced in GERM\*1100. Students will attain a grasp of essential grammatical concepts and the ability to converse comfortably in everyday situations. This course may not normally be taken by anyone who has Grade 12U German.

*Prerequisite(s):* GERM\*1100

#### **GERM\*2050 Introduction to Literature W (2-1) [0.50]**

This course introduces students to the scholarly study of literature, including critical commentaries. The course focuses on the notion of a European literary tradition in which works by German and Italian authors are key. The lectures are in English, but students taking the course under this code will read texts originally written in German in the original language and Italian works in English translation. Students will submit some work in German.

*Prerequisite(s):* GERM\*2490

*Restriction(s):* ITAL\*2050

#### **GERM\*2400 Contemporary Germany W (3-0) [0.50]**

A multimedia approach to contemporary German culture, 20th-century history and recent political events. Emphasis on oral work in German.

*Prerequisite(s):* GERM\*1110 or equivalent

#### **GERM\*2490 Intermediate German I F (3-1) [0.50]**

This course will include systematic oral and written practice, discussion of contemporary texts, and comprehensive grammar review.

*Prerequisite(s):* Grade 12U German or GERM\*1110

#### **GERM\*2500 Intermediate German II W (3-1) [0.50]**

This course provides for further development of conversational and writing skills and serves as an introduction to more complex grammar.

*Prerequisite(s):* GERM\*2490

#### **GERM\*2560 Themes in German Literature/Culture F (3-0) [0.50]**

This course provides students with further skills for interpreting literary texts through an exploration of themes that have shaped German literature and culture.

*Prerequisite(s):* GERM\*2050 or permission of the instructor

#### **GERM\*3020 Myth and Fairy Tales in Germany F (1-0) [0.50]**

The course explores the role of mythology, fairy tales and legends in German literature and culture of the late 18th and 19th centuries. Topics may include the formation of a national identity, the allegorical fairy tale and its role in Romanticism, women and the fairy tale, the fairy tale and the socialization of children (incl. Disney), romantic mythology in music, art and literature. Authors may include Goethe, Brothers Grimm, ETA Hoffman, Wagner. Lectures and texts are English. Students registered in GERM\*3020 will meet a fourth hour per week to discuss texts in German. This course is offered in conjunction with HUMN\*3020. (Offered in even-numbered years.)

*Prerequisite(s):* (GERM\*2050 or GERM\*2590), GERM\*2560

*Co-requisite(s):* HUMN\*3020

*Restriction(s):* GERM\*3440, HUMN\*3440

#### **GERM\*3470 Holocaust & WWII in German Lit. & Film F (1-0) [0.50]**

This course focuses on texts and films pertaining to World War II and the Holocaust, the development of the thoughts and the language of genocide, and the representation of the Holocaust in literature and films. The objective is to gain an understanding of the ideas and emotions underlying ethnocentrism and anti-Semitism, and to consider artistic responses to the experience of persecution and mass-murder. Lectures and discussions are in English. Students registered in GERM\*3470 will meet a fourth hour per week to discuss texts in German. This course is offered in conjunction with HUMN\*3470 (Offered in odd-numbered years)

*Prerequisite(s):* GERM\*2050, GERM\*2560

*Co-requisite(s):* HUMN\*3470

#### **GERM\*3500 Advanced German I F (3-0) [0.50]**

A study of advanced German grammar as well as aspects of structure and style of the German language, will be covered through oral presentations and discussions with a special emphasis on essay writing. Translation into idiomatic German and English are also emphasized.

*Prerequisite(s):* GERM\*2500

#### **GERM\*3510 Advanced German II W (3-0) [0.50]**

This course provides a continued study of advanced German grammar, as well as aspects of structure and style of the German language, through oral presentations and discussions with a special emphasis on essay writing.

*Prerequisite(s):* GERM\*3500

*Restriction(s):* GERM\*3530

#### **GERM\*3600 Directed Readings in German Studies U (3-0) [0.50]**

A reading course in German literature designed according to the program and interest of the individual student.

*Restriction(s):* Instructor consent required.

#### **GERM\*4940 Research Paper in German Studies U (3-0) [0.50]**

A reading course on some approved topic in German language or literature, leading to an end-of-term research paper.

*Restriction(s):* Instructor consent required.

## Greek

### *School of Languages and Literatures*

*NOTES: Literary texts are, at all levels, studied in the original language. Students registering in these courses will be expected to have the appropriate knowledge. Higher level courses in Greek are available as language modules attached to selected Classical Studies courses. (See Classical Studies course descriptions.)*

#### **GREK\*1100 Preliminary Greek I F (3-0) [0.50]**

A beginning course in Greek, providing the fundamentals of structure and idiom. (This course may not be taken by anyone who has Grade 11 Greek).

#### **GREK\*1110 Preliminary Greek II W (3-0) [0.50]**

A continuation of GREK\*1100.

*Prerequisite(s):* GREK\*1100 or Grade 12 Greek

#### **GREK\*2020 Greek Language and Culture F (3-0) [0.50]**

Consolidation of fundamental morphology and syntax acquired in GREK\*1100 and GREK\*1110. Intensive reading in texts that also illuminate aspects of Greek culture.

*Prerequisite(s):* GREK\*1110

## Hispanic Studies

### *School of Languages and Literatures*

*All courses are conducted in Spanish (reading , writing and speaking), and literary texts are, at all levels, studied in the original language.*

#### **HISP\*1100 Introductory Spanish I F,W (3-1) [0.50]**

This course introduces students to the basics of spoken and written Spanish through the study of grammar and vocabulary. The course is for students with no previous studies in Spanish. (Also offered through Distance Education format).

*Equate(s):* SPAN\*1100

#### **HISP\*1110 Introductory Spanish II F,W (3-1) [0.50]**

This is a continuation of HISP\*1100. Students will develop and apply increased reading, writing, listening and oral skills in Spanish through the study of new vocabulary and grammatical structures. (Also offered through Distance Education format).

*Prerequisite(s):* HISP\*1100 or SPAN\*1100

*Equate(s):* SPAN\*1110

#### **HISP\*2000 Intermediate Spanish I F,W (3-1) [0.50]**

This course is for students who have completed Spanish at first-year university or grade 12 level, and for heritage Spanish speakers. The course examines grammatical structures in greater depth. It focuses on vocabulary acquisition, oral and written practice, and exposes students to topics in culture.

*Prerequisite(s):* 1 of 4U Spanish, HISP\*1110, SPAN\*1110 , (or equivalent)

*Equate(s):* SPAN\*2000

#### **HISP\*2010 Intermediate Spanish II F,W (3-1) [0.50]**

Continuing with the textbook used in HISP\*2000, students will improve skills in reading, writing and conversation through further study of grammar. The course will encourage students to formulate and support opinions on cultural content.

*Prerequisite(s):* HISP\*2000 or SPAN\*2000

*Equate(s):* SPAN\*2010

#### **HISP\*2040 Culture of Spain F (3-0) [0.50]**

An examination of the historical and cultural events that provided the background for the development of modern Spain, as well as a visual survey of Spanish culture.

*Prerequisite(s):* 1 of HISP\*1110, SPAN\*1110 , 4U Spanish

*Equate(s):* SPAN\*2040

#### **HISP\*2990 Hispanic Literary Studies W (3-0) [0.50]**

An introduction to literary studies in Spanish. The course focuses on critical terminology and methods through a selection of prose, poetry and drama from Spain and Spanish America.

*Prerequisite(s):* 1 of HISP\*1110, SPAN\*1110 , 4U Spanish

*Equate(s):* SPAN\*2990

#### **HISP\*3080 Spanish American Culture W (3-0) [0.50]**

A survey through selected readings, class discussion and audio-visual materials of the Spanish American countries, their histories, society, institutions and culture.

*Prerequisite(s):* 1 of HISP\*2000, SPAN\*1110 , 4U Spanish

*Equate(s):* SPAN\*3080

#### **HISP\*3210 Topics in Hispanic Studies F,W (3-0) [0.50]**

This course, taught in Spanish, with texts in the original language, provides an intensive study of a specific aspect of Hispanic Studies.

*Prerequisite(s):* HISP\*3220 or HISP\*3230

#### **HISP\*3220 Literature and Arts I: Spain Pre-1936 F (3-0) [0.50]**

This course will be taught in Spanish, with texts studied in the original language, and provides a detailed examination of a theme, period or movement in the literature and/or arts of Spain prior to the Spanish Civil War. Topics explored in given years may include Golden Age Drama, the 19th-century novel or early 20th-century avant garde movements.

*Prerequisite(s):* HISP\*2990 or SPAN\*2990

#### **HISP\*3230 Literature and Arts II: Latin America Pre-1950 W (3-0) [0.50]**

This course provides a detailed examination of a theme, period or movement in the literature and/or arts of Latin America before 1950. Topics explored may include the regionalist novel, modernista poetry or colonial literature . The course will be taught in Spanish, with texts studied in the original language.

*Prerequisite(s):* HISP\*2990 or SPAN\*2990

#### **HISP\*3240 Topics in Hispanic Linguistics W (3-0) [0.50]**

This course offers an introduction to the study of variation in Latin American Spanish in its social context. Topics include linguistic variation, linguistic change, bilingualism, dyglossia, language attitude, code-switching, language planning and conversation analysis.

*Prerequisite(s):* (HISP\*1110 or SPAN\*1110 ), LING\*1000

#### **HISP\*3500 Advanced Spanish I F (3-0) [0.50]**

An advanced language course that focuses on the refinement of students' written and verbal communication skills in Spanish.

*Prerequisite(s):* HISP\*2010 or SPAN\*2010

*Equate(s):* SPAN\*3500

#### **HISP\*3530 Business Spanish W (3-0) [0.50]**

A detailed study of the Spanish language as it is currently used in administration and business. It will cover areas such as administrative correspondence, reports, employment, business communication and advertising.

*Prerequisite(s):* HISP\*3500 or SPAN\*3500

*Equate(s):* SPAN\*3530

#### **HISP\*3800 Directed Readings in Hispanic Studies U (3-0) [0.50]**

A reading course in Spanish or Spanish American literature designed according to the previous studies and the interests of the individual student. Normally, students will not be permitted to take more than two courses in the Directed Readings sequence.

*Prerequisite(s):* 1.00 credits from the following: HISP\*3220, HISP\*3230, SPAN\*3080 , SPAN\*3110 , SPAN\*3120 , SPAN\*3130 , SPAN\*3160 , SPAN\*3170 , SPAN\*3180 , SPAN\*3300 , SPAN\*3320

*Equate(s):* SPAN\*3800

*Restriction(s):* Instructor consent required.

#### **HISP\*3810 Directed Readings in Hispanic Studies U (3-0) [0.50]**

A reading course in Spanish or Spanish American literature designed according to the previous studies and the interests of the individual student. Normally, students will not be permitted to take more than two courses in the Directed Readings sequence.

*Prerequisite(s):* 1.00 credits from the following: HISP\*3220, HISP\*3230, SPAN\*3080 , SPAN\*3110 , SPAN\*3120 , SPAN\*3130 , SPAN\*3160 , SPAN\*3170 , SPAN\*3180 , SPAN\*3300 , SPAN\*3320

*Equate(s):* SPAN\*3810

*Restriction(s):* Instructor consent required.

#### **HISP\*4100 Seminar in Hispanic Studies F,W (3-0) [1.00]**

This seminar is taught in Spanish, with texts studied in the original language. It provides an opportunity for students to study and research a specific aspect of Hispanic Studies.

*Prerequisite(s):* HISP\*4410 or HISP\*4420

#### **HISP\*4410 Senior Seminar on Latin American Post-1950 F (3-0) [1.00]**

This seminar is taught in Spanish, with texts studied in the original language, and will explore in detail a major movement, period or theme in post-1950 Latin American literature or culture. Students who have completed this course previously should register in HISP\*4100.

*Prerequisite(s):* HISP\*2990 or SPAN\*2990

#### **HISP\*4420 Senior Seminar on Spain or Africa Post-1936 W (3-0) [1.00]**

This seminar is taught in Spanish, with readings from texts in the original language. It addresses a major issue, movement, theme or period in the post-1936 literature and culture of Spain, or, in some years, of the Spanish-speaking regions of Africa.

*Prerequisite(s):* HISP\*2990 or SPAN\*2990

#### **HISP\*4500 Spanish Translation I F (3-0) [0.50]**

This course introduces students to the theory and practice of translation by applying current theoretical principles and linguistic precision to the process of translation from Spanish to English. Students work with a variety of texts from fields including journalism, business, science and literature.

*Prerequisite(s):* HISP\*3530 or SPAN\*3530

*Equate(s):* SPAN\*4500

#### **HISP\*4520 Spanish Translation II W (3-0) [0.50]**

This course builds on the theoretical foundations studied in HISP\*4500 or SPAN\*4500 , and enhances translation skills. Working on translations from English to Spanish, students will perfect expression in Spanish through extensive vocabulary enrichment and grammatical analysis.

*Prerequisite(s):* HISP\*4500 or SPAN\*4500

*Equate(s):* SPAN\*4520

#### **HISP\*4840 Research Paper in Hispanic Studies U (3-0) [1.00]**

Students will write an intensive research paper in Spanish on a topic relating to a literary or linguistic subject in Hispanic Studies. This paper will be completed within one semester and students will be assigned to a faculty supervisor who will oversee the project.

*Prerequisite(s):* HISP\*3220 or HISP\*3230

*Equate(s):* SPAN\*4840

*Restriction(s):* Instructor Consent Required.

## History

### Department of History

*Students wishing to take a 3000 level course must have pass standing in at least 7.50 university credits.*

*Students wishing to take a 4000 level course must have pass standing in at least 10.00 credits. Access to all 4000 level courses is restricted to students in the B.A. Honours program with a minimum 70% average in all history course attempts.*

*Students should note the prerequisite requirements for upper level courses in planning their individual programs.*

*Content of individual courses may vary depending on the instructor; students therefore should check course outlines at the time of course selection.*

*Courses marked (C) are core courses required of all History program students.*

*Courses marked (H) are honours courses. Students in a general program wishing to take these must obtain the permission of instructors concerned.*

#### **HIST\*1010 The Early Modern World F,W (3-0) [0.50]**

This course will deal with the evolution and expansion of European society during the pre-industrial era. Commencing with the Renaissance and Reformation it will survey such themes as the voyages of exploration, the impact of western culture on indigenous societies, the development of commercial capitalism, the transformation of science and technology and the conflict between imperial powers in Europe and overseas. (C)

#### **HIST\*1150 The Modern World F,W (3-0) [0.50]**

This course covers world history since the nineteenth century with particular emphasis on Asia, Africa, and the Americas.

#### **HIST\*1250 Science and Society Since 1500 F,W (3-0) [0.50]**

This course is intended as an introduction to the history of science and its interrelationships with society in the western world since 1500, including its influence on the environment, religion, economics and political developments, warfare, etc. Particular emphasis will be laid upon scientific developments in the 19th or 20th centuries.

*Restriction(s):* ASCI\*1000

#### **HIST\*2000 The British Isles, 1066-1603 S,F (3-0) [0.50]**

A comparative survey of the histories of England, Scotland, Ireland and Wales during the Medieval and Early Modern eras. Stress will be placed upon common themes such as institutional development, warfare and the often violent interaction between the English and the Celtic peoples.

#### **HIST\*2020 Film as History W (2-1) [0.50]**

This course will consider film both as a source and as a comment on the past. Topics will vary depending on instructor expertise, and may include film as propaganda, the city in film, film as myth, women and gender in film, film and war.

#### **HIST\*2040 War and Society F (3-0) [0.50]**

Concentrating on developments following the introduction of gunpowder, the course will consider the evolution of military strategy and tactics, the impact of technology on warfare, and the relationship between war and civilian populations.

#### **HIST\*2070 World Religions in Historical Perspective W (3-0) [0.50]**

This course introduces students to the comparative study of religion in history and the interaction of religion with general social and cultural traits over time. A focus on the cultural roots of specific traditions and religion as a metaphor will account for the spread of these diverse traditions across social and national boundaries. This course will consider eastern religions, primal religions, 'People of the Book' (Judaism, Christianity and Islam considered together), and the 'New Religious Movements' (a category considering religions and para-religions produced by modernity). (Offered through Distance Education format only).

#### **HIST\*2100 Pre-Confederation Canada F (3-0) [0.50]**

A study of selected events and issues in pre-Confederation Canadian history including political, economic, social, and cultural developments (C).

*Prerequisite(s):* HIST\*1010 (may be taken as co-requisite)

*Restriction(s):* HIST\*2601/2

#### **HIST\*2200 The Medieval World F (3-0) [0.50]**

The major events and developments in Europe, north Africa and Western Asia from the fall of the Roman Empire to 1500 a.d. Emphasis will be placed on the evolution of western Christianity, the rise and expansion of Islam, the emergence of the University, and the growth of literacy and print culture culminating in the humanist movement of the late Middle Ages.

#### **HIST\*2250 Environment and History F,W (3-0) [0.50]**

An introduction to the field of environmental history - its nature and uses. This course provides a historical perspective to environmental issues. It examines the causes and impact of human-induced modification of the natural world in selected areas of the globe, the evolution of attitudes and ideas about the natural world over time and the growth of conservation/environmental issues and movements. (Also offered through Distance Education format.)

#### **HIST\*2260 Religion and Society W (3-0) [0.50]**

This course surveys the major trends in religious beliefs and practices and their social impact since the Reformation. The focus of the course is on the British Isles and North America with some discussion of developments in Continental Europe. (Offered through Distance Education format only.)

#### **HIST\*2300 The United States Since 1776 F (3-0) [0.50]**

This course provides a survey of United States history from the Revolutionary period to the present. Course lectures, readings and assignments ask students to interrogate broadly the social, cultural, economic and political changes and continuities in America, as well as the nation's emergence as a superpower.

*Restriction(s):* HIST\*2150 , HIST\*2650

#### **HIST\*2340 Migrations in the Atlantic World, 1500-1850 W (3-0) [0.50]**

The rise of the Atlantic world, with its variety of communities, cultures, and political and social regimes, was in the context of forced and voluntary migrations of Africans, Europeans, and Asians. The course will explore the nature of these societies and the linkages and interactions within and between the different areas of this broad but integrated region. The course emphasis from semester to semester may be on comparative examination of the social and political development and experiences of the peoples of any or all of its regions; of its slave and labour regimes; and of the evolution of modern nationhood.

*Restriction(s):* HIST\*2110 , HIST\*2960

#### **HIST\*2450 The Practising Historian F,W (3-0) [0.50]**

This course is designed to acquaint students with the development of historical writing, the interpretive problems surrounding the study of history, and the methods employed by historians. (C) (Also offered in Distance Education format.)

*Prerequisite(s):* 1.00 credits in History at the 1000 or 2000 level including HIST\*1010 (which may be taken as a co-requisite)

#### **HIST\*2500 Britain Since 1603 U (3-0) [0.50]**

This course will survey the history of England and the Celtic Regions of the British Isles from the close of the Tudor period up to the mid-20th century. Emphasis will be placed on social and economic development before and after the Industrial Revolution as well as on those political and military challenges which have characterized Britain's status as a global power in the modern era.

#### **HIST\*2510 Modern Europe Since 1789 F (3-0) [0.50]**

This course will deal with the emergence of modern European society as the result of socio-economic and consequent political changes from the French Revolution, through the World Wars, to the collapse of communism and the formation of the European Union.

#### **HIST\*2600 Post-Confederation Canada W (3-0) [0.50]**

This course is a study of selected events and issues in post-Confederation Canadian history including political, economic, social, and cultural developments (C).

*Prerequisite(s):* HIST\*2100

*Restriction(s):* HIST\*2601/2

#### **HIST\*2610 Contemporary Canadian Issues W (3-0) [0.50]**

A study of selected issues in modern Canadian history, the subjects investigated in this course may include aboriginal populations, the environment, the state, the family, and will vary with the expertise of the instructor. (Offered through Distance Education format only.)

#### **HIST\*2800 The History of the Modern Family W (3-0) [0.50]**

An examination of the family since 1500 with particular emphasis on the English speaking world, though comparisons will be made with other societies. Topics considered will include: change in the legal structure of marriage; power relations and sex roles within the family; the role of kin in the family; changing attitudes to sexuality; the attitude of state to the family and its functions.

#### **HIST\*2820 Modern France Since 1750 U (3-0) [0.50]**

This course is a survey of French history from the beginning of modernization in the 18th century to the challenges of the late 20th century. Topics will include the Revolution, the Napoleonic period, social and political transformation in the 19th century, the Great War, the defeat of 1940 and Vichy, and the remarkable changes in French life since the Second World War.

<b>HIST*2850 Ancient Greece and Rome W (3-0) [0.50]</b>
The history of the Mediterranean World from prehistoric Greece through Classical Greece and Rome to the legalization of Christianity in the Roman Empire in the 4th century will be covered in this course.
<b>HIST*2890 Early Islamic World F (3-0) [0.50]</b>
This course is an introduction to the history of Islam. The course will consider the founding of Islam, and its global diffusion, from the seventh to the fourteenth centuries.
<b>HIST*2910 Modern Asia W (3-0) [0.50]</b>
An introduction to the histories and cultures of Asia since 1750. This course will consider the evolution of Asian religions, cultural identities, concepts of state and of society in the modern era.
<b>HIST*2920 Republican Latin America W (3-0) [0.50]</b>
This course will study selected themes in the history of Latin American republics from the independence period to the modern era.
<b>HIST*2930 Women and Cultural Change F (3-0) [0.50]</b>
Using gender and ethnicity as the main categories of analysis, this course examines the history of women within one global geographical region such as Asia, South America and the Caribbean or North America. The roles women have played in political, economic and private life will be emphasized.
<b>HIST*3020 Sexuality and Gender in History U (3-0) [0.50]</b>
This course provides an introduction to the issues of sexuality and gender within history. The course will enable students to develop an understanding of how issues of masculinity, femininity, and sexuality were developed and defined across cultures. The chronological and geographic focus of the course may vary according to the interests and expertise of the instructor. (Also offered through Distance Education format.)
<i>Prerequisite(s):</i> 7.50 credits including 1.00 credits in History
<b>HIST*3030 Celtic Britain and Ireland to 1066 W (3-0) [0.50]</b>
The social, political and cultural history of the Celtic peoples of the British Isles from Prehistory to the advent of the Normans will be discussed. Special consideration will be given to the development of Celtic institutions as well as to comparative study of successive waves of invaders-Romans, Anglo-Saxons, Vikings and Normans. (Offered through Distance Education format only.)
<i>Prerequisite(s):</i> 7.50 credits including HIST*2000
<b>HIST*3060 American Society W (3-0) [0.50]</b>
This course is a study of selected aspects of American society focusing on the 19th and 20th Centuries. Specific topics, which will vary according to the expertise of the instructor, may include such themes as War and American society, the Jacksonian Era, Civil War America, or American popular culture.
<i>Prerequisite(s):</i> 7.50 credits including (1 of HIST*2150 , HIST*2300, HIST*2650 )
<b>HIST*3070 Modern India W (3-0) [0.50]</b>
This course studies the history of modern India from 1757 to the present day. Topics include: European and British imperialism in India, Indian reactions to imperialism, socio-religious movements, the birth of nationalism and the nation-state in India, civil society and social issues in a developing nation, regionalism, foreign policy and India's place in the 21 <sup>st</sup> century.
<i>Prerequisite(s):</i> 7.50 credits
<b>HIST*3080 United States in the World F (3-0) [0.50]</b>
This course is a study of the United States as a global phenomenon. Thematic topics will go beyond foreign policy and military history to include imperialism, immigration, globalization, race, gender, ethnicity, consumption, tourism, and international cultural industries.
<i>Prerequisite(s):</i> 7.50 credits including (1 of HIST*1150, HIST*2150 , HIST*2300, HIST*2650 )
<b>HIST*3130 Popular Culture and Punishment, 1700-1900 F (3-0) [0.50]</b>
The course will survey the social, political and intellectual influences upon the leisure activities of Europeans and Americans in the period with special reference to institutions such as the prison, the asylum, the reformatory and the regulation of popular culture and leisure activities. Witchcraft and the witch-hunt will be discussed.
<i>Prerequisite(s):</i> 7.50 credits including (HIST*1010 or SOC*1500)

<b>HIST*3140 Witch-hunts and Popular Culture S (3-0) [0.50]</b>
This course will explore the phenomenon of the 'witch-hunts' in early modern Europe through a focus on Scotland in the period 1560-1700. In doing so it will provide students with a background on the history of Scotland during the early modern period and introduce them to the considerable body of historical writing on the subject of the witch-hunts. In addition, students will explore notions of both elite culture and the 'popular culture' of those elements of society frequently neglected by historians. Due to the fact that the overwhelming majority of the accused witches were women, the course will include examinations of gender history and its contributions to our understandings of the period. (Offered through Distance Education format only.)
<i>Prerequisite(s):</i> 7.50 credits including HIST*1010
<b>HIST*3150 History and Culture of Mexico U (3-0) [0.50]</b>
This course will cover the history and culture of Mexico from its Precolumbian civilizations to the present. Topics may include: Aztec and Mayan civilizations, European discovery and conquest, inquisition, convents, independence, the Mexican revolution, indigenismo, NAFTA and Zapatista insurgency in Chiapas.
<i>Prerequisite(s):</i> 7.50 credits
<b>HIST*3160 Canadian Political History U (3-0) [0.50]</b>
This course consists of a detailed study of the background and development of the Canadian political process and culture. It devotes special attention to the changing role and character of the state.
<i>Prerequisite(s):</i> 7.50 credits including (HIST*2600 or HIST*2601/2 )
<b>HIST*3180 Canada Since 1945 U (3-0) [0.50]</b>
This course provides an in-depth examination of political, social, cultural, and economic changes in Canada since the Second World War. Particular attention will be paid to the increased diversity of the Canadian population, the development of Canadian institutions, and the changing role played by Canada in the world.
<i>Prerequisite(s):</i> 7.50 credits including (HIST*2600 or HIST*2601/2 )
<b>HIST*3200 Youth in History F (3-0) [0.50]</b>
This course examines the social history of childhood, youth and adolescence in western culture and how life-cycles vary as a function of class, race and ethnicity, gender and sexuality. It will examine the experiences of young people in different historical eras. Questions to be explored include: Does the notion of adolescence transcend history and culture? How have experts constructed institutions such as the high school, the juvenile justice system, the media, medical and social scientific research to channel youth rebellion? Historical case studies will be selected to show generations in political, community and domestic conflict. This interdisciplinary history course draws upon sociology, anthropology, cultural studies, art, music, literature, academic writing and research from Europe, Canada and the United States.
<i>Prerequisite(s):</i> 7.50 credits.
<b>HIST*3230 Spain and Portugal, 1085 to 1668 F (3-0) [0.50]</b>
The course examines the history of Spain and Portugal from the period of the reconquista to overseas expansion. The course covers the political, diplomatic, religious and cultural development of early modern Spain and Portugal and the rise of the overseas empire.
<i>Prerequisite(s):</i> 7.50 credits including HIST*2200
<b>HIST*3270 Revolution in the Modern World W (3-0) [0.50]</b>
This course offers a comparative analysis of revolutionary movements in the modern world. It focuses on the French Revolution, the development of a revolutionary tradition in the 19th century, the Russian Revolution, and the Communist Revolution in China. Comparative themes include the relative importance of ideology and class conflict, the emergence of professional revolutionaries, and the relationship between revolutions and international relations.
<i>Prerequisite(s):</i> 7.50 credits
<b>HIST*3310 Disease and History U (2-0) [0.50]</b>
This interdisciplinary course provides an introduction to the historical interactions between disease and human society from the Middle Ages to the present. Major themes may include the co-construction of disease and society; disease and urbanization; disease and colonialism; disease and globalization; disease and gender. (Offered in even-numbered years.)
<i>Prerequisite(s):</i> 7.50 credits
<b>HIST*3320 Modern China F (3-0) [0.50]</b>
This course examines the history and culture of China since the nineteenth century. Topics may include economics, gender, imperialism, militarism, politics, and religion.
<i>Prerequisite(s):</i> 7.50 credits including HIST*2910



**HIST\*3350 Modern Germany U (3-0) [0.50]**

This course will be devoted to a study of major themes in modern German history, and to an analysis of Germany's role in post-war Europe. Topics include the unification of Germany, the role of nationalism in modern German history, the significance of the Bismarck era, the rise of Hitler and the development of the two Germanies until their unification in 1990.

*Prerequisite(s):* 7.50 credits

*Restriction(s):* HIST\*2830

**HIST\*3380 British Imperialism in Asia and Africa F (3-0) [0.50]**

This course examines the British Empire from the 18<sup>th</sup> through the 20<sup>th</sup> centuries. It focuses on: the empire in Asia and Africa; ideologies of empire; and European and non-European approaches and reactions to empire.

*Prerequisite(s):* 7.50 credits including HIST\*2500 or HIST\*2510

**HIST\*3410 Pre-Colonial Africa F (3-0) [0.50]**

This course will include studies on the Ibo, Yoruba and Edo societies; on the Dahomey, Hausa, Western Congo and Angola states; and the effect of the Atlantic slave trade on African societies. Emphasis will be given to the householding system, lineage group organization, subsistence agriculture, and the sources of African History.

*Prerequisite(s):* 7.50 credits including (1 of HIST\*1150, HIST\*2340, HIST\*2960 )

**HIST\*3420 Colonial Latin America F (3-0) [0.50]**

This course covers the history of Latin America from the pre-Columbian period to age of independence in the early nineteenth century. Topics include pre-Columbian civilizations; the European conquest; the development of colonial societies and politics; the growth of slavery; eighteenth-century imperial reform, and the rise of independence movements. (Offered in even-numbered years.)

*Prerequisite(s):* 7.50 credits

**HIST\*3430 Topics in Environment and Society U (3-0) [0.50]**

This is a topical course, which builds on themes introduced in HIST\*2250, Environment and History. Topics may include global deforestation; the origins of the global environmental movement; agriculture and the environment; the environmental impact of cultural encounters.

*Prerequisite(s):* 7.50 credits including HIST\*2250

**HIST\*3440 The Global Sixties F (3-0) [0.50]**

This course examines the political, social, and cultural history of one of the most important decades in the twentieth century: the sixties. It adopts global perspectives to ask how and why the sixties mattered in the development of the modern world. A diverse range of themes may be covered, from the political controversies stirred up by the Vietnam War, decolonisation in Africa, Mao's cultural revolution, the Cuban missile crisis, and the upheavals of 1968 to the social changes occasioned by the introduction of the birth control pill, the rise of The Beatles, and the emergence of television.

*Prerequisite(s):* 7.50 credits

**HIST\*3450 The Uses of History U (2-1) [0.50]**

As an introduction to the use of history outside the classroom, this course discusses public history and memory through the activities of governments, corporations, and voluntary associations. History as political propaganda, marketing strategy, and ideological support in a global and historical context is examined. Discussions will focus on history as presented in films, television, monuments, museums, commemorations, and other public and popular media.

*Prerequisite(s):* 7.50 credits including HIST\*2450

**HIST\*3470 Independent Reading U (3-0) [0.50]**

A course of independent study, based on a comprehensive reading list provided by the department. Evaluation will be based on two written examinations.

*Prerequisite(s):* 7.50 credits

*Restriction(s):* Instructor consent required.

**HIST\*3480 Workplace Learning U (0-0) [0.50]**

An independent study course based on either History related voluntary or paid workplace experience. Evaluation will be based on assignments relating to work duties. These will usually be in the form of a weekly journal, and a major project relating to some specific aspect of the work experience. Students interested in this option must have their project approved by the department prior to the semester in which they plan to engage in their work experience. Students will then be assigned to a faculty supervisor who will oversee the project.

*Prerequisite(s):* 7.50 credits including 1.50 History or equivalent credits

*Restriction(s):* Instructor consent required.

**HIST\*3530 Celtic Britain and Ireland Since 1603 U (3-0) [0.50]**

This course will deal with the Celtic peoples in the British Isles and their effort to maintain their cultural, economic and political independence.

*Prerequisite(s):* 7.50 credits including (1 of HIST\*2000, HIST\*2500)

**HIST\*3540 World War II W (3-0) [0.50]**

This course is an in-depth analysis of the immediate causes and impact of the Second World War focusing on the influence of military events, on the social, political and economic developments of the major participating nations. (Also offered through Distance Education format.)

*Prerequisite(s):* 7.50 credits including (2 of HIST\*1150, HIST\*2040, HIST\*2100, HIST\*2300, HIST\*2500, HIST\*2510, HIST\*2601/2 , HIST\*2600, HIST\*2650 , HIST\*2830 , HIST\*3350)

**HIST\*3570 Women in Modern Europe U (3-0) [0.50]**

This course will examine selected topics in modern European women's history. Attention will be given to action in the public sphere, women's personal and family lives and occupations.

*Prerequisite(s):* 7.50 credits including (1 of HIST\*2500, HIST\*2510, HIST\*2800, HIST\*2930)

**HIST\*3580 Women's History in Asia U (3-0) [0.50]**

This course examines the roles of women in one or more countries of Asia through the prisms offered by ideas of 'race', class, gender, social status, material culture, intellectual life, and ideology.

*Prerequisite(s):* 7.50 credits including (1 of HIST\*1150, HIST\*2800, HIST\*2890, HIST\*2910, HIST\*2930)

**HIST\*3590 Ancient & Medieval India U (3-0) [0.50]**

This course examines the history of India from the beginnings of civilization on the Indian subcontinent to the end of the Great Mughals in the 18th century. It provides an overview and analysis of the cultural, social, religious, political and economic development of Indian civilization, including development from tribe to state to civil society, political organization, socio-religious movements, cultural contact and exchange, and the development of a composite culture.

*Prerequisite(s):* 7.50 credits

**HIST\*3600 Quebec and French Canada U (2-0) [0.50]**

This course examines selected themes in the social, economic, political and cultural evolution of Quebec and its relations with the rest of Canada. The course may also examine the development of French Canadian and Acadian communities in other provinces.

*Prerequisite(s):* 7.50 credits including (HIST\*2600 or HIST\*2601/2 )

**HIST\*3640 Madness and Psychiatry F (3-0) [0.50]**

This course will explore madness and the history of psychiatry in the modern world. Topics may include the development of asylums, wild children and human nature, the rise and fall of hysteria, psychoanalysis, as well as ways in which psychiatry has related to imperialism, racial policies, sexuality, gender, religious beliefs, and war. (Offered in odd-numbered years)

*Prerequisite(s):* 7.50 credits including (ASCI\*1000 or HIST\*1250)

**HIST\*3660 Canadian Social History U (2-0) [0.50]**

This course examines selected themes in the development of Canadian society such as the role of class, the social consequences of industrialization and urbanization, immigration, ethnicity and religion, education and culture.

*Prerequisite(s):* 7.50 credits including (HIST\*2600 or HIST\*2601/2 )

**HIST\*3690 Darwin, Culture and Society U (2-0) [0.50]**

This course will focus on the historical, social, and cultural dimensions of Darwin's theory of evolution, from the late 18<sup>th</sup> century to the present. Topics may include: natural history, classification, social Darwinism, race and imperialism, science & religion, science & literature, the eugenics movement, the Scopes trial, the modern evolutionary synthesis, sociobiology, gender, antievolutionism and creationism/intelligent design.

*Prerequisite(s):* 7.50 credits including (ASCI\*1000 or HIST\*1250)

**HIST\*3750 The Reformation U (3-0) [0.50]**

The changes in religious, social and cultural life in 16th century Europe will be discussed. This course will examine the impact of humanism, the developments in urban culture known as the Renaissance, the reform movements, in central and western Europe, the Catholic response, and the resulting disintegration of the medieval social order.

*Prerequisite(s):* 7.50 credits including HIST\*1010

<b>HIST*3820 Early Modern France U (3-0) [0.50]</b>
This course surveys French History from the renaissance to the French Revolution. Students will examine the emergence of the powerful monarchy, 16th-century religious conflict and civil war, and the social, political and intellectual developments of the 17th and 18th centuries, which culminated in the 1789 Revolution.
<i>Prerequisite(s):</i> 7.50 credits
<b>HIST*3830 Modern Middle East W (3-0) [0.50]</b>
This course explores struggles for national independence in the region after 1919, the impact of the developing oil industry, the creation of Israel and the resulting Arab-Israeli conflict, the rise of American influence, the divisiveness of Cold War politics, and the role of women in contemporary Islamic societies.
<i>Prerequisite(s):</i> 7.50 credits including HIST*2890
<b>HIST*3840 Ottoman Empire, 1300-1923 W (3-0) [0.50]</b>
This course examines the rise of the Ottoman Empire in the 14th century, both in Europe and the Middle East, and traces its evolution until its demise in the 20th century. Students investigate the historiographical debates surrounding various aspects of writing Ottoman history.
<i>Prerequisite(s):</i> 7.50 credits including HIST*2890
<b>HIST*3910 Africa Since 1800 W (3-0) [0.50]</b>
This course will trace the suppression of the slave trade and the opening of Africa to European imperialism. Emphasis will be given to resistance movements and rising nationalism between the two World Wars. An endeavour will be made to relate the national liberation movement to the achievement of independence.
<i>Prerequisite(s):</i> 7.50 credits including (1 of HIST*1150, HIST*2340, HIST*2960 )
<b>HIST*4030 Historical Biography U (3-0) [1.00]</b>
This advanced research seminar asks students to consider the role of the individual in history by reading theoretical works and examples drawn from the major schools of thought on this issue. Students will undertake to write a biography that will utilize primary sources and will include a detailed historiographical discussion of the works available on their chosen subject. (H)
<i>Prerequisite(s):</i> 10.00 credits including 1.50 credits in History at the 3000-level
<i>Restriction(s):</i> Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.
<b>HIST*4040 Topics in Scottish History U (3-0) [1.00]</b>
A seminar course dealing with selected aspects of Scottish social, economic and political history. The seminars will be based upon an examination of primary sources from the University library's extensive Scottish Collections, as well as secondary literature. Students should consult with the department for specific offerings. (H)
<i>Prerequisite(s):</i> 10.00 credits including HIST*3530
<i>Restriction(s):</i> Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.
<b>HIST*4050 Topics in Scottish History U (3-0) [1.00]</b>
A seminar course dealing with selected aspects of Scottish social, economic and political history. The seminars will be based upon an examination of primary sources from the University library's extensive Scottish Collections, as well as secondary literature. Students should consult with the department for specific offerings. (H)
<i>Prerequisite(s):</i> 10.00 credits including HIST*3530
<i>Restriction(s):</i> Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.
<b>HIST*4090 Modern European History U (3-0) [1.00]</b>
This course is an in-depth examination of a theme or themes from European history in the nineteenth and/or twentieth centuries. Topics chosen will vary with expertise of the instructor. (H)
<i>Prerequisite(s):</i> 10.00 credits including (1 of HIST*1150, HIST*2510, HIST*3090 )
<i>Restriction(s):</i> Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.
<b>HIST*4100 Africa and the Slave Trades U (3-0) [1.00]</b>
This course will discuss the origins, character, and operation of slavery and the export slave trades in Africa. It will examine the interaction between domestic slavery and the export slave trades, on the one hand, and demographic, political, economic, social and cultural impact on African states and societies, on the other. Other themes to be examined include slave resistance in Africa, and abolition and the introduction of legitimate commerce and their impact on Africa. (H)
<i>Prerequisite(s):</i> 10.00 credits including (1 of HIST*2340, HIST*2960 , HIST*3410, HIST*3910)
<i>Restriction(s):</i> Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.

<b>HIST*4120 Topics in Global History U (3-0) [1.00]</b>
This course focuses on issues that emphasize the history of connections between different parts of the world. Topics may include the growth of the world economy; transformations of the global environment; trade and exchange; diasporas and migration. (H)
<i>Prerequisite(s):</i> 10.00 credits including 1.50 credits in History at the 3000-level
<i>Restriction(s):</i> Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.
<b>HIST*4140 Sexuality in the Middle Ages F (3-0) [1.00]</b>
This course will provide a thematic approach to the foundations of western attitudes towards sex and sexuality as they developed in the European Middle Ages. It will examine the complex interweaving of Greek and Roman medicine, medieval Christian canon law and theology, and Germanic popular beliefs, which together provided the underpinnings of western values and practices pertaining to human sex and sexuality, with enduring results. The course will take an historiographical approach to topics and themes.
<i>Prerequisite(s):</i> 10.00 credits including (1 of HIST*2000, HIST*2200, HIST*3020)
<i>Restriction(s):</i> Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.
<b>HIST*4160 Seminar in Canadian Political History U (3-0) [1.00]</b>
Political events, key personalities, the political process, and state instruments and institutions will be analyzed with a view to understanding historical aspects of the political system and culture in Canada. (H)
<i>Prerequisite(s):</i> 10.00 credits including (HIST*2600 or HIST*2601/2 )
<i>Restriction(s):</i> Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.
<b>HIST*4180 American Identities F (3-0) [1.00]</b>
This course analyzes how Americans have constructed and enacted identities in the U.S. as citizens and consumers through investigating concepts such as 'race', ethnicity, gender, sexuality, class, regional distinctions, and nationalism. (H)
<i>Prerequisite(s):</i> 10.00 credits including (HIST*2300 or HIST*2650 )
<i>Restriction(s):</i> HIST*4210 , restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.
<b>HIST*4220 Canadian Cultural Identity U (3-0) [1.00]</b>
This seminar examines the origins, major themes, and historical development of Canadians' cultural identities. Possible topics include anti-Americanism, loyalism, multiculturalism, official bilingualism, mass culture, tourism, folklore, and state cultural policies. (H)
<i>Prerequisite(s):</i> 10.00 credits including (HIST*2600 or HIST*2601/2 )
<i>Restriction(s):</i> HIST*3220 , restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.
<b>HIST*4280 Poverty and Policy in the Victorian Age U (3-0) [1.00]</b>
Starting with the debates over the New Poor Law of 1834, this course will examine the changing content of the notion of poverty, and changing methods adopted to treat it. It will also look at the lives of the poor, in so far as these can be reconstructed from contemporary sources. (H)
<i>Prerequisite(s):</i> 10.00 credits including HIST*2500
<i>Restriction(s):</i> Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.
<b>HIST*4450 History with Numbers F (3-0) [1.00]</b>
This course surveys the use of quantitative methods, the historical evolution of data generation and recording, and the use of quantitative sources in historical analysis and evidence in historical research. The principal objective is to build numeracy among senior History students. Case studies and example will be drawn from studies of inequality, family structure and migration from a variety of regions in Europe, Asia, Africa and the Americans. (H)
<i>Prerequisite(s):</i> 10.00 credits including HIST*2450, and at least 1.00 credits in History at the 3000 level or above.
<i>Restriction(s):</i> Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.
<b>HIST*4470 Special History Project Seminar I U (3-0) [0.50]</b>
This course is designed to train honours students in the techniques of research, interpretation and writing of history. The student will choose a topic for intensive study from a list approved by the department. (H)
<i>Prerequisite(s):</i> 10.00 credits
<i>Restriction(s):</i> Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts. Instructor consent required.

**HIST\*4560 Topics in Revolution U (3-0) [1.00]**

This seminar course is designed to explore one or more social or political or intellectual revolutions in the early modern or modern era depending on the expertise of the instructor. Students should consult the department for specific offerings. (H)

*Prerequisite(s):* 10.00 credits

*Restriction(s):* Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.

**HIST\*4580 The French Revolution U (3-0) [1.00]**

This seminar course provides an in-depth analysis of the French Revolution, 1789-1799, and the literature surrounding its interpretation. (H)

*Prerequisite(s):* 10.00 credits including (1 of HIST\*2510, HIST\*2820, HIST\*3270, HIST\*3820)

*Restriction(s):* Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.

**HIST\*4620 Seminar in Canadian Rural History U (3-0) [1.00]**

This course will examine selected topics in the social and economic transformation of rural Canada with relevant comparisons to the rest of North America and elsewhere. (H)

*Prerequisite(s):* 10.00 credits including (HIST\*2600 or HIST\*2601/2 )

*Restriction(s):* Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.

**HIST\*4670 Seminar in Science and Society W (3-0) [1.00]**

This course will discuss the way science is rooted in society and culture. It will explore the broad field of the history of science, the social role of the scientist, the impact of scientific methods, technology, machines and networks. Students will emerge with the ability to grapple with many of the challenges involved in rethinking the history of science in social and cultural terms. (H)

*Prerequisite(s):* 10.00 credits including 1 of ASCI\*1000, HIST\*1250, HIST\*3690

*Restriction(s):* Restricted to students in the B.A. Honours or B.A.S. program with a minimum of 70% average in all History course attempts.

**HIST\*4680 Urban America, 1870-1920 W (3-0) [1.00]**

This course examines the development of urban life in the United States between the Civil War and World War I. Course readings, discussions and assignments ask students to investigate the environmental, cultural, social, economic, and political realities that drove the process of urbanization, and the ways cities shaped modern America. (H)

*Prerequisite(s):* 10.00 credits including ( 1 of HIST\*2150 , HIST\*2300, HIST\*2650 )

*Restriction(s):* Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.

**HIST\*4700 Topics in Medieval History U (3-0) [1.00]**

A detailed analysis of selected aspects of the Middle Ages from c. 1000. Students should consult the department for specific offerings. (H)

*Prerequisite(s):* 10.00 credits including HIST\*2000 or HIST\*2200

*Restriction(s):* Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.

**HIST\*4820 Topics in Islamic History W (3-0) [1.00]**

A seminar course designed to explore selected aspects of Islamic history and/or historiography. Students should consult the department for specific offerings.

*Prerequisite(s):* 10.00 credits, (1 of HIST\*2890, HIST\*3830, HIST\*3840)

**HIST\*4900 Topics in Modern India W (3-0) [1.00]**

This course will examine the development of India from a British colony to independent nation state and modern nation from the 18th to the 21st centuries. It examines the foundations of imperialism in India, Indian political nationalism, and post-colonial identity and the new India. (H)

*Prerequisite(s):* 10.00 credits including (1 of HIST\*2910, HIST\*3070, HIST\*3380)

*Restriction(s):* Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.

**HIST\*4970 Special History Project Seminar II U (3-0) [0.50]**

A continuation of HIST\*4470. (H)

*Prerequisite(s):* 10.00 credits

*Restriction(s):* Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts. Instructor consent required.

## Human Kinetics

*Department of Human Health and Nutritional Sciences*

### **HK\*2100 Anatomy for Artists W (3-3) [0.50]**

The structure of the human body will be considered in this course. The limitations imposed by bones, joints and muscle will be explored in relation to capacity of the human figure to move and to express emotion. This course has been designed for students registered in the Studio Arts program. This course can fulfill one of the natural and mathematical sciences requirements for students in SART, but it cannot be used towards the SART major.

*Prerequisite(s):* SART\*2090

*Restriction(s):* Restricted to Studio Arts majors.

### **HK\*2270 Principles of Human Biomechanics W (3-1) [0.50]**

This course will address the application of mechanical principles to the study of human movement. Topics will include: motion analysis techniques, anthropometrics, biological tissue tolerance, muscle force generation, static and dynamic equilibrium, work/energy and impulse/momentum as they apply to the description of motion, injury of musculoskeletal tissues and optimization of human performance.

*Prerequisite(s):* 4.00 credits including (BIOL\*1040 or BIOL\*1090), (PHYS\*1000 or PHYS\*1080)

### **HK\*3100 Neuromuscular Physiology W (3-0) [0.50]**

Normal muscle movement is controlled by the motor cortex or by reflexes within the context of the sensory environment. This course will introduce key concepts in motor control of mammalian, human movement, coordination of movement, motor program selection, motor program execution, motor unit recruitment, skeletal muscle excitation-contraction coupling. This course is required for students wishing to gain certification by the Ontario Kinesiology Association.

*Prerequisite(s):* 1 of BIOM\*3100, BIOM\*3200, HK\*3940, ZOO\*3200

*Restriction(s):* Restricted to B.Sc., Major in Human Kinetics or Neuroscience Minor.

### **HK\*3401 Human Anatomy: Dissection F (3-3) [0.75]**

First part of the two-semester course HK\*3401/2. Refer to HK\*3401/2 for course description.

*Co-requisite(s):* HK\*3940 or instructor consent

*Restriction(s):* HK\*3501/2 Registration in the B.Sc. Major in Human Kinetics or Bio-Medical Science. Instructor consent required.

### **HK\*3401/2 Human Anatomy: Dissection F-W [1.50]**

A two-semester lecture and laboratory course in human anatomy which includes a detailed study of the skeleton, upper and lower limbs, thorax, abdomen, pelvis, perineum, head, neck and central nervous system. The labs involve hands-on dissection. This is a two-semester course offered over consecutive semesters. When you select it you must select HK\*3401 in the Fall semester and HK\*3402 in the Winter semester. A grade will not be assigned to HK\*3401 until HK\*3402 has been completed.

*Co-requisite(s):* HK\*3940 or instructor consent

*Restriction(s):* HK\*3501/2. Registration in the B.Sc. Major in Human Kinetics or Bio-Medical Science. Instructor consent required

### **HK\*3402 Human Anatomy: Dissection W (3-3) [0.75]**

Second part of the two-semester course HK\*3401/2. Refer to HK\*3401/2 for course description.

*Prerequisite(s):* HK\*3401

### **HK\*3501 Human Anatomy: Prosection F (3-2) [0.75]**

First part of the two-semester course HK\*3501/2. Refer to HK\*3501/2 for course description.

*Co-requisite(s):* HK\*3940

*Restriction(s):* HK\*3401/2. Registration in the B.Sc. Major in Human Kinetics or Bio-Medical Science. Instructor consent required.

### **HK\*3501/2 Human Anatomy: Prosection F-W [1.50]**

A two-semester lecture and laboratory course in human anatomy which includes a detailed study of the skeleton, upper and lower limbs, thorax, abdomen, pelvis, perineum, head, neck and central nervous system. Labs involve observation of anatomical details using prosections and dissected specimens. This is a two-semester course offered over consecutive semesters. When you select it you must select HK\*3501 in the Fall semester and HK\*3502 in the Winter semester. A grade will not be assigned to HK\*3501 until HK\*3502 has been completed.

*Co-requisite(s):* HK\*3940

*Restriction(s):* HK\*3401/2, Registration in the B.Sc. Major in Human Kinetics or Bio-Medical Science. Instructor consent required

### **HK\*3502 Human Anatomy W (3-2) [0.75]**

Second part of the two-semester course HK\*3501/2. Refer to HK\*3501/2 for course description.

*Prerequisite(s):* HK\*3501

### **HK\*3600 Applied Human Kinetics I F (3-3) [0.75]**

This course covers laboratory techniques which are central to human biology, together with their underlying concepts. Human performance and function are evaluated through cellular, organic, systemic and whole person studies. The student's technical competence and conceptual understanding are emphasized.

*Prerequisite(s):* HK\*2270

*Co-requisite(s):* HK\*3940

*Restriction(s):* Registration in the Human Kinetics major.

### **HK\*3940 Human Physiology F (6-0) [1.25]**

This course consists of a series of lectures, demonstrations and tutorials designed for students desiring a knowledge of physiological concepts as they apply to human beings. The course discusses cellular physiology, neurophysiology, endocrinology, and the physiology of the following systems: cardiovascular, renal, gastrointestinal and respiratory with an emphasis on the regulation of function.

*Prerequisite(s):* [BIOL\*1040 or (BIOL\*1080, BIOL\*1090)], BIOC\*2580

### **HK\*4070 Clinical Biomechanics F (3-2) [0.50]**

This course covers functional anatomy, neurophysiology and mechanical characteristics of humans at the tissues and whole-body levels. Pathomechanics of human movement resultant from disease, abuse or trauma will be examined. Special emphasis will be placed on etiology, testing and correction of functional disorders with special reference to balance, gait and orthopaedic biomechanics.

*Prerequisite(s):* ENGG\*2660 or (HK\*2270, HK\*3600)

### **HK\*4230 Advanced Study in Human Health and Nutritional Sciences S,F,W (3-0) [0.50]**

The student will conduct independent literature research of an approved topic to be decided by the student in consultation with a faculty advisor. Students must make arrangements with both a faculty advisor and the course coordinator at least one semester in advance and the signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the student is registered for the course.

*Prerequisite(s):* 12.00 credits

*Restriction(s):* Course coordinator consent required.

### **HK\*4240 Occupational Biomechanics and Ergonomics W (3-2) [0.75]**

This course introduces the methods available for reducing musculoskeletal injuries in the workplace. Topics include: biomechanical, psychophysical, physiological, and integrated approaches to performing physical demands analyses, anatomy and etiology of low back injuries and upper limb disorders, principles of redesigning tasks to reduce the risk of injury, pre-employment screening and legislated guidelines. Students apply the course material to ergonomic assessments performed in industrial environments.

*Prerequisite(s):* 1 of ENGG\*1210, HK\*3270, (HK\*2270, HK\*3600)

### **HK\*4360 Research in Human Health and Nutritional Sciences S,F,W (0-12) [1.00]**

The student will select a research topic and design and complete a project in an area of interest, in consultation with a faculty advisor. Students must make arrangements with both a faculty advisor and the course coordinator at least one semester in advance and the signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the student is registered for the course.

*Prerequisite(s):* 12.00 credits

*Restriction(s):* Course coordinator consent required.

### **HK\*4371 Research in Human Health and Nutritional Sciences II S,F,W (0-6) [0.50]**

First part of the two-semester course HK\*4371/2. The student will select a research topic and design and complete a project in an area of interest, in consultation with a faculty advisor. This is a two-semester course offered over consecutive semesters. When you select it you must select HK\*4371 in the first semester and HK\*4372 in the second semester. A grade will not be assigned to HK\*4371 until HK\*4372 has been completed. Students must make arrangements with both a faculty advisor and the course coordinator at least one semester in advance and the signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the student is registered for the course.

*Prerequisite(s):* 12.00 credits

*Restriction(s):* Course coordinator consent required.

**HK\*4371/2 Research in Human Health and Nutritional Sciences II S-F,W,W-S [1.00]**

The student will select a research topic and design and complete a project in an area of interest, in consultation with a faculty advisor. This is a two-semester course offered over consecutive semesters. When you select it you must select HK\*4371 in the first semester and HK\*4372 in the second semester. A grade will not be assigned to HK\*4371 until HK\*4372 has been completed. Students must make arrangements with both a faculty advisor and the course coordinator at least one semester in advance and the signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the student is registered for the course.

*Prerequisite(s):* 12.00 credits

*Restriction(s):* Course coordinator consent required.

**HK\*4372 Research in Human Health and Nutritional Sciences II F,W,S (0-6) [0.50]**

Second part of the two-semester course HK\*4371/2. The student will select a research topic and design and complete a project in an area of interest, in consultation with a faculty advisor. This is a two-semester course offered over consecutive semesters. When you select it you must select HK\*4371 in the first semester and HK\*4372 in the second semester. A grade will not be assigned to HK\*4371 until HK\*4372 has been completed. Students must make arrangements with both a faculty advisor and the course coordinator at least one semester in advance and the signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the student is registered for the course.

*Prerequisite(s):* HK\*4371

*Restriction(s):* Course coordinator consent required.

**HK\*4441 Advanced Study in Human Anatomy F (1-10) [1.00]**

First part of the two-semester course HK\*4441/2. This course will provide students who have completed HK\*3401/2 with the opportunity to pursue anatomical studies in an interdisciplinary fashion at the advanced level. Students will use their knowledge in anatomy to develop educational material and/or teach anatomical concepts and applications of human anatomy. This is a two-semester course offered over consecutive semesters. When you select it you must select HK\*4441 in the first semester and HK\*4442 in the second semester. A grade will not be assigned to HK\*4441 until HK\*4442 has been completed. Students must make arrangements with the course coordinator at least one semester in advance, and the signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the student is registered for the course.

*Prerequisite(s):* HK\*3402, HK\*3940

*Restriction(s):* Course coordinator consent required.

**HK\*4441/2 Advanced Study in Human Anatomy F-W [2.00]**

This course will provide students who have completed HK\*3401/2 with the opportunity to pursue anatomical studies in an interdisciplinary fashion at the advanced level. Students will use their knowledge in anatomy to develop educational material and/or teach anatomical concepts and applications of human anatomy. This is a two-semester course offered over consecutive semesters. When you select it you must select HK\*4441 in the first semester and HK\*4442 in the second semester. A grade will not be assigned to HK\*4441 until HK\*4442 has been completed. Students must make arrangements with the course coordinator at least one semester in advance, and the signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the student is registered for the course.

*Prerequisite(s):* HK\*3402, HK\*3940

*Restriction(s):* Course coordinator consent required.

**HK\*4442 Advanced Study in Human Anatomy W (1-10) [1.00]**

Second part of the two-semester course HK\*4441/2. This course will provide students who have completed HK\*3401/2 with the opportunity to pursue anatomical studies in an interdisciplinary fashion at the advanced level. Students will use their knowledge in anatomy to develop educational material and/or teach anatomical concepts and applications of human anatomy. This is a two-semester course offered over consecutive semesters. When you select it you must select HK\*4441 in the first semester and HK\*4442 in the second semester. A grade will not be assigned to HK\*4441 until HK\*4442 has been completed. Students must make arrangements with the course coordinator at least one semester in advance, and the signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the student is registered for the course.

*Prerequisite(s):* HK\*4441

*Restriction(s):* Course coordinator consent required.

**HK\*4460 Regulation of Human Metabolism W (3-0) [0.50]**

The course focuses on the underlying metabolic events that occur in association with exercise. Skeletal muscle metabolism and substrate delivery are discussed with respect to the intracellular biochemical events integrated with both the endocrine and the chemical aspects of neural mechanisms.

*Prerequisite(s):* HK\*3940, ( HK\*4320 or NUTR\*4210)

**HK\*4550 Human Cardio-respiratory Physiology F (3-0) [0.50]**

The central focus of this course is a comprehensive examination of the effects of a variety of work parameters on normal cardio-respiratory adjustments required to meet metabolic demands. Immediate adjustments to increase metabolic rate as well as long term cardio-respiratory adaptability will be discussed.

*Prerequisite(s):* HK\*3940

**HK\*4600 Applied Human Kinetics II W (3-3) [0.75]**

The objective of this course is to expand on the introductory laboratory practices developed in HK 3600 Applied Human Kinetics I. Students will examine the functioning of a human body at rest and in motion, while learning clinical and advanced laboratory techniques. The students will be introduced to the underlying concepts of various physiological and biomechanical measures in lecture. Subsequently, the principles from the lecture will be used to make direct measures in the laboratory, with an emphasis on understanding exercise physiology, clinical testing practices, and integrative approaches to studying human movement. Students will be asked to critically analyze the laboratory measures and findings, and to integrate the lecture and laboratory material in formalized laboratory reports.

*Prerequisite(s):* HK\*3600

*Restriction(s):* Restricted to students in Human Kinetics.

**HK\*4610 Health and Injury Biomechanics W (3-2) [0.50]**

This course presents an overview of bone and joint function from a biomechanics perspective, within the framework of health and injury. Particular emphasis is placed on the influence of biomechanical signals on the regulation of bone and joint structure and function. Individual diseases, such as osteoarthritis, will be considered as they impact the various tissues of the joint (cartilage, ligament and bone) and the neuromuscular system. The laboratory will provide supplementary material illustrating particular aspects of musculoskeletal function including in vivo and in vitro biomechanical testing. (Offered in odd-numbered years.)

*Prerequisite(s):* ENGG\*3150 or HK\*2270

## Horticultural Science

### Department of Plant Agriculture

#### **HORT\*1120 Grape and Wine Science W (3-0) [0.50]**

This course will examine whole plant physiology as illustrated by the perennial system of a grapevine. Students will investigate all the primary functions of a green plant, with each function then related to a grapevine and how it functions in nature. Each function of the vine will be connected to the ultimate effects on fruit quality and by extension, wine quality throughout the course. (Offered through Distance Education format only.)

*Restriction(s):* HORT\*3430, Not acceptable for students in the B.Sc., B.Sc.(Agr.) or B.Sc.(Env.) programs.

#### **HORT\*1130 Science of Gardening F (3-0) [0.50]**

This course examines the growth, development and physiology of horticultural species used for food and ornamental aesthetic purposes. The interaction between plants and impact of environmental factors as such as light, temperature, CO<sub>2</sub> and humidity [on plant processes] will be emphasized.

*Restriction(s):* Not acceptable for students in the B.Sc., B.Sc.(Agr.) or B.Sc.(Env.) programs.

#### **HORT\*2450 Introduction to Turfgrass Science F (3-2) [0.50]**

The biology, ecology, adaptation, and uses of cool-season and warm-season turfgrass species and cultivars will be introduced. Topics will include the identification and life strategies of different turfgrass species, principles of reproduction and techniques for establishment of turfgrass by seeding, sprigging and sodding. The ecology of management including mowing, irrigation, cultivation, mineral nutrition, repair and renovation, and management of stresses (thatch, weeds, insects, disease) will be covered. The turfgrass industry will be introduced, including application of ecological principles to athletic field management, sod production, golf course management, and professional lawn care.

*Prerequisite(s):* BIOL\*1040 or [BIOL\*1090, (BIOL\*1070, BIOL\*1080)]

*Restriction(s):* HORT\*3220

#### **HORT\*3010 Annual, Perennial and Indoor Plants - Identification and Use F (2-2) [0.50]**

This course focuses on the identification and adaptation of annual, biennial, perennial herbaceous and indoor plants. Lectures will be integrated with outdoor laboratory activities to emphasize utilization of plant groups in park, perennial border, general landscape botanic garden and interiorscape settings. (Offered in odd-numbered years.)

*Prerequisite(s):* 0.50 credits in botany

#### **HORT\*3050 Management of Turfgrass Insect Pests and Weeds F (3-2) [0.50]**

Biology, behavior and impact of insect pests of turfgrass and recognition of symptoms will be emphasized. Identification and management of weed species commonly found in turfgrass will be discussed. Environmental impacts of cultural and chemical control techniques will be discussed for each group of pests and advances in chemical and biological control methods will be developed.

*Prerequisite(s):* HORT\*2450

*Restriction(s):* DTM\*3300

#### **HORT\*3230 Plant Propagation F (2-2) [0.50]**

In this course principles and practices of propagation for horticultural plants are explored, including sexual (seed propagation, seed maturation, dormancy and seed germination) and, vegetative (asexual propagation, including division, layering, budding, grafting and tissue culture).

*Prerequisite(s):* 1 of BIOL\*1040, BIOL\*1070, BIOL\*1090

#### **HORT\*3270 Medicinal Plants W (3-0) [0.50]**

This course will focus on the use of medicinal plants, specifically in view of the application of recent biotechnology advancements in their production and processing for enhancing human health. (Offered in even-numbered years)

*Prerequisite(s):* 1 of BIOL\*1040, BIOL\*1070, BIOL\*1080

#### **HORT\*3280 Greenhouse Production W (3-3) [0.50]**

Principles and practices of production, culture and marketing of greenhouse flower and vegetable crops.

*Prerequisite(s):* BOT\*3310 or PBIO\*3110

#### **HORT\*3350 Woody Plant Production and Culture W (3-3) [0.50]**

Techniques of producing field and container-grown woody landscape nursery stock are integrated with techniques of planting and maintaining individual trees in the cultivated landscape. This course encompasses nursery stock production and arboriculture.

*Prerequisite(s):* 1 of BIOL\*1030, BIOL\*1070, BIOL\*1090, BIOL\*1500, ZOO\*1500

*Equate(s):* HORT\*3340 , HORT\*4250

#### **HORT\*3430 Wine-Grape Culture W (3-0) [0.50]**

The history and impact of grape-growing in the New World will be presented and studied. Grape (*Vitis*) taxonomy (ampelography) and physiology will be studied as it relates to the Old World/New World wine growing. The physiology of fruiting and vegetative balance for managing wine quality in the vineyard will be integrated with basic wine-making practices and general oenological techniques. (Offered through Distance Education only.)

*Prerequisite(s):* AGR\*2470 or BOT\*2100

#### **HORT\*3510 Vegetable Production F (3-3) [0.50]**

The vegetable industry and the characteristics, culture, storage and marketing of field-grown vegetable crops will be studied. Organic vegetable production will also be considered.

*Prerequisite(s):* BOT\*2100

#### **HORT\*4200 Turf, the Environment and Society W (3-0) [0.50]**

The course will explore the environmental impact of turfgrass management in urban and rural landscapes and society's perception of the how those areas should be used. Emphasis will be placed on the ecology of turfgrass systems and issues surrounding society's perception of management practices. The impact of public perception about the management and environmental impact of turfgrass areas in urban and rural landscapes will be discussed, including the issues surrounding the use and maintenance of turfgrass ecosystems.

*Prerequisite(s):* HORT\*2450, HORT\*4450, (1 of BIOL\*2060, BOT\*2050 , CROP\*2110)

#### **HORT\*4300 Postharvest Physiology W (3-3) [0.50]**

An examination and discussion of physiological and biochemical processes unique to postharvest development and deterioration. Principles and practices of storing fruits, vegetables, and florists' and nursery stocks as well as marketing pathways for horticultural crops will be considered.

*Prerequisite(s):* BOT\*3310 or PBIO\*3110

#### **HORT\*4380 Tropical and Sub-Tropical Crops F (3-0) [0.50]**

Principles involved in the production and utilization of tropical and sub-tropical crops. School of Environmental Design and Rural Development.

*Prerequisite(s):* AGR\*1250

#### **HORT\*4420 Fruit Crops F (3-3) [0.50]**

Growth patterns, fruiting characteristics and adaptation to environmental conditions of fruit crops in temperate regions. Classification, cultural practices including propagation and the physiological principles underlying these practices will be emphasized.

*Prerequisite(s):* BOT\*2100

#### **HORT\*4450 Advanced Turfgrass Science W (3-2) [0.50]**

This course builds on basic principles learned in Introduction to Turfgrass Science with an emphasis on plant stressors and physiological responses of plants to stress. Interactions between the soil system, the plant and the environment are considered, with focus on how soil physical, chemical and biological properties as well as environmental factors affect turfgrass plant health and physiology. Principles and strategies of biological control, cultural practices that affect plant health, pest life cycles and pest population levels are addressed in order to develop integrated management plans for turf aimed at reducing pest levels in an environmentally benign manner.

*Prerequisite(s):* HORT\*2450

## Human Resources and Organizational Behaviour

Department of Business - College of Management and Economics

### HROB\*2010 Foundations of Leadership F,W (3-0) [0.50]

Using an integrated approach to studying leadership, this foundation course covers history, evolving theories, models, and research both from a theoretical point of view and practical application. This course will use a seminar style with applied workshops, class discussions, guest speakers, and student participation. Students will prepare elements of a skills portfolio and a research paper. This is a required course for the Certificate in Leadership. (Also offered through Distance Education format.)

*Equate(s):* BUS\*2010

*Restriction(s):* UNIV\*2000

### HROB\*2100 Managing People in Organizations F,W (3-0) [1.00]

This course will use an integrative approach to help you to understand, predict and influence how individuals behave at work. In addition, students will be provided with the tools to attract, select and retain the right employees, while recognizing the role of the organization's culture and strategy and the impact of external forces. This course will use Human Resource Management practices to illustrate the importance of understanding Organizational Behavioural Theories. Many real world examples will be used to provide a relevant and rich learning experience. (Also offered through Distance Education format.)

*Prerequisite(s):* 2.00 credits

*Restriction(s):* BUS\*2090, BUS\*3000, BUS\*4000 , HTM\*2200 , HTM\*3000 , HTM\*4100 , HTM\*4390 , ISS\*2500 , Restricted to students in B.Comm, B.A.Sc. AHN, and B.A. EURS.

### HROB\*3010 Compensation Systems F,W (3-0) [0.50]

This course focuses on how organizations attract, retain, and motivate employees through formal and informal reward mechanisms. Topics include: developing pay structures, job analysis, job evaluation, pay systems, pay system administration, equity issues, and benefits. (Also offered through Distance Education format.)

*Prerequisite(s):* 1 of BUS\*3000, HROB\*2100, HTM\*3000

*Equate(s):* BUS\*3010 , PSYC\*3010

*Restriction(s):* Priority Access course. Enrolment restricted to particular programs or specializations. See department for more information.

### HROB\*3030 Occupational Health and Safety F,W (3-0) [0.50]

The major objective of this course is to introduce Human Resources Professionals to this broad and ever changing field. Occupational Health and Safety, is an inherently technical subject far broader than legislation only. The multiple dimensions of the various issues - technical, legislative, political and personal are a required part of the training for a professional in this field. (Also offered through Distance Education format.)

*Prerequisite(s):* 9.00 credits including (1 of BUS\*3000, HROB\*2100, HTM\*3000 )

*Equate(s):* BUS\*3030 , PSYC\*3060

*Restriction(s):* Priority Access course. Enrolment restricted to particular programs or specializations. See department for more information.

### HROB\*3050 Employment Law F (3-0) [0.50]

This course will introduce students to Canadian employment law, specifically rules that govern the relations between employees and employers. Subject areas will include the history of employment law, employment contracts, creation and modification of the employment relationship, employer and employee obligations, employment standards, human rights legislation and termination. International comparisons will also be examined. (First offering - Fall 2013)

*Prerequisite(s):* 9.00 credits including HROB\*2100

*Restriction(s):* Restricted to students in B.Comm, B.A.Sc. AHN, and B.A. EURS

### HROB\*3070 Recruitment and Selection F,W (3-0) [0.50]

This course will provide students with the appropriate tools needed to recruit and select employees, identify related competencies, identify performance appraisal methods, and evaluate the effectiveness of these programs within the context of our Canadian legal framework. (Also offered through Distance Education format.)

*Prerequisite(s):* 1 of BUS\*3000, HROB\*2100, HTM\*3000

*Equate(s):* BUS\*3070 , PSYC\*3070

*Restriction(s):* Priority Access course. Enrolment restricted to particular programs or specializations. See department for more information.

### HROB\*3090 Training and Development F,W (3-0) [0.50]

This course focuses on how organizations develop employee skills through training and development programs. Topics will include: adult learning principles, training needs assessments, training program design, instructional methodologies, coaching and mentoring, individualized development and program evaluation. (Also offered through Distance Education format.)

*Prerequisite(s):* 1 of BUS\*3000, HROB\*2100, HTM\*3000

*Equate(s):* BUS\*3090 , PSYC\*3090

*Restriction(s):* Priority Access course. Enrolment restricted to particular programs or specializations. See department for more information.

### HROB\*3100 Managerial Skills F,W (3-0) [0.50]

This course is designed to help students develop critical managerial skills such as self-awareness, managing conflict and stress, communicating effectively, and interviewing. (First offering - Fall 2013)

*Prerequisite(s):* 9.00 credits including HROB\*2100

*Restriction(s):* BUS\*2090, BUS\*4000 , HTM\*2200 , HTM\*4100 , HTM\*4390 , ISS\*2500

### HROB\*4000 Strategic Human Resource Management W (3-0) [1.00]

This course examines the management of human resources from a strategic perspective, focusing on how organizations can achieve competitive advantage through their people. Students will be challenged to integrate their knowledge of organizational behaviour and the various human resource functions to develop strategic solutions to organizational issues. (First offering - Winter 2015)

*Prerequisite(s):* HROB\*4100

### HROB\*4010 Leadership Capstone W (3-0) [0.50]

This course is the capstone course for students completing the Certificate in Leadership. Based on their prior course work and experience in their leadership placements, students will examine the relationships between leadership theory and practice, assess their effectiveness in a leadership role, and develop a personal plan for further developing their leadership skills. (Offered through Distance Education format only.)

*Prerequisite(s):* ( BUS\*2010 or HROB\*2010) plus 120 hours of placement experience

*Equate(s):* BUS\*4010

*Restriction(s):* UNIV\*4000 Instructor consent required.

### HROB\*4030 Advanced Topics In Human Resource Management U (3-0) [0.50]

Students will actively examine issues in selected topic areas of human resource management at an advanced level and with a focus on application in an actual organizational setting. The focal area of the course, or range of human resource management topics covered by the course, will vary depending on instructor. Selected topic areas may include corporate social responsibility, leadership issues, strategic human resource management, gender issues, human rights issues, recruitment methods and outcomes, functional job analysis and validation methods, job performance criteria and appraisal tools, selection processes and tools, organizational justice, work attitudes, and prejudice and discrimination in the workplace. Specific topic areas will be announced prior to the course selection period.

*Prerequisite(s):* 1 of BUS\*3000, HROB\*2100, HTM\*3000

*Equate(s):* BUS\*4030

### HROB\*4060 Human Resources Planning W (3-0) [0.50]

This course Introduces the strategic planning role that human resources professionals play in organizations. Students will confront the challenges and demands of rightsizing, technological change, corporate repositioning, cost containment, productivity improvements, and the consequences of relocation, outplacement and retraining of staff. An understanding of the essential elements of the human resource planning process in organizations will be provided. Students will acquire knowledge in analyzing, assessing and programming for the human resource requirements of organizational, business and strategic plans.

*Prerequisite(s):* 15.00 credits including (1 of BUS\*3000, HROB\*2100, HTM\*3000 )

*Equate(s):* BUS\*4060 , HTM\*4160

*Restriction(s):* Priority Access course. Enrolment restricted to particular programs or specializations. See department for more information.

**HROB\*4100 Applied Research in Human Resources Management F (3-0) [1.00]**

This course provides students with the opportunity to conduct hands-on research in an organization on issues that relate to Human Resource Management. Students will work in groups and be expected to find organizations for their research project. Although students will be primarily accountable for finding their organizations to work with, instructor support will be provided to assist students if difficulties arise. The instructor will also serve as a resource throughout the project. Lecture topics include: understanding organizational issues, understanding the consulting process (e.g. engagement, communication, ethics), project planning, data collection methods in an applied context (e.g. sampling, confidentiality, practical constraints), and report writing.

*Prerequisite(s):* 1 of BUS\*3000, HROB\*2100, HTM\*3000

*Equate(s):* BUS\*4100 , PSYC\*4100

*Restriction(s):* Priority Access course. Enrolment restricted to particular programs or specializations. See department for more information.



## Hospitality and Tourism Management

### School of Hospitality and Tourism Management

#### HTM\*1000 Introduction to Hospitality and Tourism Management F (3-0) [0.50]

This course is a survey of the hospitality and tourism industry, with reference to its historical development, growth, and organization. The management process and the scope of the industry today are examined.

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C, TMGT or UND, BA European Studies (EURS), Area of Emphasis in European Business.

#### HTM\*2010 Hospitality and Tourism Business Communications F,W (3-0) [0.50]

This course is designed to enhance students' confidence and professionalism in the hospitality and tourism industry by improving their communication skills. The focus is primarily on writing, but also includes effective speaking and presentation skills. The assignments are based on hospitality and tourism issues.

*Prerequisite(s):* HTM\*1000 or HTM\*2700

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT.

#### HTM\*2030 Control Systems in the Hospitality Industry F,W (4-0) [0.50]

This is a study of the policies and procedures required to control food, beverage and other products, payroll and other operating costs. Areas examined include such topics as cost behaviour and analysis, menu analysis, budget preparation and the interpretation of data. The course will also stress the application of analytical techniques. Examples from all industry segments will be used. (Also offered through Distance Education format.)

*Prerequisite(s):* HTM\*2000 or HTM\*2700

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT, B.A.Sc. AHN.

#### HTM\*2050 Dimensions of Tourism F (3-0) [0.50]

This course examines tourism as an amalgam of industries - transportation, accommodation, travel, trade and other facilitating services; follows a multidisciplinary approach in its analysis, organization, planning and control. (Last offering - Fall 2011)

*Prerequisite(s):* HTM\*2120 or MCS\*1000

*Equate(s):* HTM\*3100

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT.

#### HTM\*2070 Meetings and Convention Management W (3-0) [0.50]

This course examines the sales, servicing and management of the meetings, events, conventions, exhibitions, and trade show industries. Emphasis is placed on both the supply (product and service providers) and demand (meeting and event managers) elements of the industry. The course focuses on the unique operational and managerial functions of this multifaceted component of the tourism and hospitality industry.

*Prerequisite(s):* HTM\*1000

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT.

#### HTM\*2100 Lodging Operations W (3-0) [0.50]

A study of the nature of unit operations in the various sectors of the lodging industry and of the functions and systems of lodging operations. Topics will include organization structure and responsibilities, sociotechnical systems and legal and security aspects.

*Prerequisite(s):* HTM\*1000

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT.

#### HTM\*2170 Tourism Policy, Planning and Development W (3-0) [0.50]

This course focuses on the various aspects of tourism planning, policy, and development. Topics covered include: reasons for development; tourism development as a strategy for urban revitalization; tourism's links to heritage conservation and regional development; sustainability and the adverse impacts of development; cultural considerations and community participation; and the importance of context for individual tourism projects.

*Prerequisite(s):* GEOG\*1220, HTM\*1000

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT, BA European Studies (EURS) Area of Emphasis in European Business.

#### HTM\*2700 Introductory Foods F,W (3-2) [0.50]

Scientific principles and their application to food preparation and food consumption. An integrated lecture and laboratory approach is used to study the chemical and physical properties of foods.

*Prerequisite(s):* 1 of Grade 12U Chemistry, OAC Chemistry, CHEM\*1000, CHEM\*1040, CHEM\*1060, CHEM\*1100

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT, B.A.Sc. AHN.

#### HTM\*2740 Cultural Aspects of Food F (3-0) [0.50]

A survey of cultural influences on individual and group food habits and patterns. The course studies the selection and use of food; the development of food beliefs, attitudes and related behaviours within the context of cultural systems.

#### HTM\*3030 Beverage Management F (2-2) [0.50]

This course provides students with knowledge of the beer, spirit, wine, coffee and soft drink industries and their importance in the hospitality environment. Course topics will include product characteristics, purchasing, pricing, control, marketing and promotion, trends and the responsible service of alcoholic beverages.

*Prerequisite(s):* 9.00 credits

*Restriction(s):* HTM\*4180 . Registration in B.Comm. HAFA, HAFA:C or TMGT. Students must be of legal drinking age in Ontario.

#### HTM\*3060 Lodging Management F (3-0) [0.50]

The intent of this course is to explore and analyze the principles and practices of lodging management and related sales activities. The management of and interaction among various divisions of lodging operations are addressed, including general management, front office/housekeeping/engineering divisions, food and beverage operations, sales and marketing, accounting and finance. Focus of the course is on communication both within and among departments, divisions, and most importantly, with the consumer.

*Prerequisite(s):* 9.00 credits including HTM\*2100

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT.

#### HTM\*3080 Hospitality and Tourism Marketing F,W (3-0) [0.50]

This course focuses on major marketing decisions that hospitality managers face in generating and sustaining demand for their products and services. Course content includes marketing strategies and practices, segmentation and target marketing, positioning and branding, pricing, promotions, personal selling, and distribution system decisions for all hospitality and tourism related businesses.

*Prerequisite(s):* 9.00 credits including HTM\*2010, ( HTM\*2120 or MCS\*1000)

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT.

#### HTM\*3090 Restaurant Operations Management F,W (4-6) [1.00]

This course covers the application of managerial functions to restaurant and foodservice operations with the emphasis on the principles of food production and service in a commercial setting.

*Prerequisite(s):* HTM\*2030, HTM\*2700

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT, B.A.Sc. AHN.

#### HTM\*3120 Operations Analysis in the Hospitality and Tourism Industry F,W (3-0) [0.50]

The analysis of operations in the hospitality and tourism industry with the aim of improving productivity of resources will be covered. Specific areas to be studied include the nature of productivity, the use of work study methods, the significance of statistical concepts and the application of operations research techniques.

*Prerequisite(s):* ECON\*2740 or STAT\*2060

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT.

#### HTM\*3150 Experiential Learning in the Hospitality Industry U (3-0) [0.50]

An independent program of study formally integrating the student's academic study with a concentrated work experience. The study is to be decided by the student in consultation with the supervisory faculty (normally the department's Co-op Co-ordinator) prior to registration in the course.

*Restriction(s):* Registration in B.Comm. HAFA:C. Instructor consent required.

#### HTM\*3160 Destination Management and Marketing F (3-0) [0.50]

This course examines the attractiveness of communities (urban and rural; domestic and international) for visitors and the implications that result from the development of a tourism industry. Methods to encourage visitation are explored as are the attempts to create and manage the development of the community and the tourism industry in a sustainable manner.

*Prerequisite(s):* HTM\*2170

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT, BA European Studies (EURS) Area of Emphasis in European Business.

#### HTM\*3180 Casino Operations Management W (0-0) [0.50]

This course examines the application of business management principles and procedures within casinos. Major topics include: the global and Canadian casino industries, regulation and control, casino accounting and statistics, casino marketing, security and surveillance, human resources, customer service, and specific casino operational management components. Students must be legal age of 19 or over. (Offered through Distance Education only.)

*Prerequisite(s):* (1 of BUS\*2090, HROB\*2100, HTM\*2200 ), (1 of ACCT\*2230, AGECE\*2230, BUS\*2230, HTM\*3070 )

*Restriction(s):* This is a priority access course. Some restrictions may apply during some time periods. Please contact the department for more information.

**HTM\*3780 Economics of Food Usage F (3-0) [0.50]**

This is an overview of food supply chain management in the food and foodservice industries of Canada with a global perspective. Food production, distribution, legislation and consumption habits impacting the economics and use of food in Canada and globally are studied. (Offered through Distance Education only.)

*Prerequisite(s):* 1 of FOOD\*2010, HTM\*2700, MCS\*1000

**HTM\*4050 Wine and Oenology W (2-2) [0.50]**

This course provides students with knowledge about the wine industry and will emphasize knowledge about product, purchasing, pricing, and service.

*Prerequisite(s):* 9.00 credits

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT. Students must be of legal drinking age in Ontario.

**HTM\*4090 Hospitality and Tourism Facilities Management and Design F,W (4-0) [0.50]**

This course will equip an individual to work as a knowledgeable member of a hospitality or tourism organization's design or re-design team. Efficient and effective space utilization for both front-and-back-of-the-house areas, plus a knowledge of how to read professional drawings ("blueprints") will be covered. This course also will provide an understanding of the operation of a physical plant including such elements as systems maintenance, appropriate use of various materials, energy management, life cycle costing, and safety and security issues.

*Prerequisite(s):* HTM\*3090

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT.

**HTM\*4110 Advanced Restaurant Operations U (1-7) [0.50]**

This course focuses on the management and operation of fine dining restaurants, and the study of major cuisines and classical cookery. Analysis of qualitative aspects of the restaurant business (ambience, total service package, and the dynamic relationship between service and the product of food and wine) is covered. Emphasis is placed upon creativity and authenticity in menu formulation, operational performance and guest satisfaction.

*Prerequisite(s):* HTM\*3090

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT.

**HTM\*4130 Current Management Topics U (3-0) [0.50]**

Principal operating problems in the hospitality and tourism industry are analyzed and discussed using actual case studies. Students should check with the School of Hospitality and TMGT to determine what topic will be offered during specific semesters, and which prerequisites, if any, are appropriate.

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT.

**HTM\*4170 International Tourism W (3-0) [0.50]**

This course encourages students to develop a cross-cultural awareness of the dimensions and issues of tourism, and the trends that shape the various sectors of the industry in every region of the world. Students will gain knowledge of the social, political and economic impacts of tourism globally, the patterns of international travel, regional development and marketing implications.

*Prerequisite(s):* 14.00 credits including HTM\*3160

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT, BA European Studies (EURS) Area of Emphasis in European Business.

**HTM\*4190 Hospitality and Tourism Operations Planning F,W (3-0) [0.50]**

The course examines management and organization practices as they are applied to typical hospitality and tourism operational issues. Significant decision points and sub-system interrelationships are emphasized.

*Prerequisite(s):* (1 of ACCT\*2230, BUS\*2230, HTM\*3070), HTM\*3080

*Co-requisite(s):* AGE\*3320 or BUS\*3320

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT.

**HTM\*4200 Policy Issues in Hospitality and Tourism Management F,W (3-0) [0.50]**

An integrative course intended to draw together the several disciplines in which hospitality and tourism management is based. Conceptual, analytical and decision-making skills will be developed through an extensive exposure to case studies. (Last offering - Fall 2014)

*Prerequisite(s):* (AGE\*3320 or BUS\*3320), (1 of ACCT\*2230, AGE\*2230, BUS\*2230, HTM\*3070), HTM\*3080

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT.

**HTM\*4250 Hospitality Revenue Management U (3-0) [0.50]**

This is a specialized course in hospitality revenue management that is tailored towards senior level HAFA and Tourism Management majors. The course builds upon previous courses by introducing hospitality revenue management theories, concepts and techniques. The objective of this course is to provide a solid foundation in revenue management for careers in hospitality management.

*Prerequisite(s):* BUS\*3320, HTM\*2100

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT majors.

**HTM\*4300 Co-operative Education Seminar F (3-0) [0.50]**

An integration of the students' academic studies with their work semester experiences provided by the co-operative program. Emphasis will be placed on students critically evaluating the application of theoretical concepts in different working environments.

*Prerequisite(s):* Registration in semester 7 of B.Comm. HAFA:C.

**HTM\*4500 Special Study in Hospitality and Tourism U (3-0) [0.50]**

The special study option is designed to provide senior undergraduate students with an opportunity to pursue an independent course of study. The topic selected will be determined by agreement between the student and the faculty member with expertise in the area.

*Restriction(s):* Registration in B.Comm. HAFA, HAFA:C or TMGT. Instructor consent required

## Humanities

### College of Arts

#### **HUMN\*3020 Myth and Fairy Tales in Germany F (3-0) [0.50]**

The course explores the role of mythology, fairy tales and legends in German literature and culture of the late 18<sup>th</sup> and 19<sup>th</sup> centuries. Topics may include the formation of a national identity, the allegorical fairy tale and its role in Romanticism, women and the fairy tale, the fairy tale and the socialization of children (incl. Disney), romantic mythology in music, art and literature. Authors may include Goethe, Brothers Grimm, ETA Hoffmann, Wagner. Lectures and texts are English. This course is offered in conjunction with GERM\*3020. (Offered in even-numbered years.)

*Prerequisite(s):* 5.00 credits

#### **HUMN\*3100 London Studies in the Humanities W (2-3) [0.50]**

An integrated course of studies in the Humanities (including 2 or more of theatre, visual arts, history, music, literature and philosophy) as they relate to London cultural resources. For London Semester students only.

*Prerequisite(s):* Admission to London Semester.

#### **HUMN\*3150 Paris Studies in the Humanities W (2-3) [0.50]**

An integrated course of study in the Humanities (including 2 or more of theatre, visual arts, history, music, literature and philosophy) as they relate to Paris cultural resources. For Paris Semester students only.

*Prerequisite(s):* Admission to Paris Semester.

#### **HUMN\*3210 Introduction to Polish History and Culture F (6-4) [1.00]**

The core course for the Krakow Semester consisting of three major components: 1) Polish language training, 2) a general introduction to Polish geography, politics and contemporary life and, 3) Polish history and the arts. For Krakow Semester students only.

*Prerequisite(s):* Admission to Krakow Semester.

#### **HUMN\*3220 Krakow Studies in the Humanities I F (3-2) [0.50]**

An integrated course of studies in the humanities as they relate to the resources of Krakow, Poland. For Krakow Semester students only.

*Prerequisite(s):* Admission to the Krakow Semester.

#### **HUMN\*3230 Krakow Studies in the Humanities II F (3-2) [0.50]**

An integrated course of studies in the humanities as they relate to the resources of Krakow, Poland. For Krakow Semester students only.

*Prerequisite(s):* Admission to the Krakow Semester.

#### **HUMN\*3240 India Studies in the Humanities W (3-0) [0.50]**

An integrated course of studies in the humanities as they relate to India. This course looks at selected aspects of one or more areas in the humanities, including Indian religions, philosophy, literature (in English), history, language (Hindi), art and music. For India Semester students only.

*Prerequisite(s):* Admission to the India Semester.

#### **HUMN\*3300 Latin American Studies in the Humanities W (1-2) [0.50]**

An integrated course of studies in the humanities as they relate to the resources of Latin America.

*Prerequisite(s):* Admission to the Latin America semester, consent of the instructor and satisfactory participation in a bi-weekly preparation seminar during the fall semester.

#### **HUMN\*3400 Renaissance Lovers and Fools W (3-0) [0.50]**

In this course, students will read Italian Renaissance plays such as Machiavelli's "The Mandrake" and Bibbiena's "Calandria" with special attention to the portrayals of lovers and fools. The course will place particular emphasis on representations of class and gender relations. Additional readings in medieval literature, history, and critical theory will provide background and context for the plays. Lectures and texts are in English. This course is offered in conjunction with ITAL\*3400.

*Prerequisite(s):* 5.0 credits

*Restriction(s):* ITAL\*2100, HUMN\*2100

#### **HUMN\*3470 Holocaust & WWII in German Lit. & Film F (3-0) [0.50]**

This course focuses on texts and films pertaining to World War II and the Holocaust, the development of the thoughts and the language of genocide, and the representation of the Holocaust in literature and films. The objective is to gain an understanding of the ideas and emotions underlying ethnocentrism and anti-Semitism, and to consider artistic responses to the experience of persecution and mass-murder. Lectures and discussions are in English. Students who wish for a German credit must register for GERM\*3470. (Offered in odd-numbered years.)

*Prerequisite(s):* 5.00 credits

*Restriction(s):* GERM\*3470

#### **HUMN\*3501 Independent Interdisciplinary Research Project F (3-0) [0.50]**

First part of the two-semester course HUMN\*3501/2. Refer to HUMN\*3501/2 for course description.

*Restriction(s):* Instructor consent required.

#### **HUMN\*3501/2 Independent Interdisciplinary Research Project F-W [1.00]**

A two-semester course designed for students enrolled in the B.A. program in 1 of the College of Arts disciplines. Students in a general program with no major must seek the approval of the B.A. program counsellor. Students will prepare proposals for independent research projects spanning 2 or more disciplines, at least 1 of which must be from the College of Arts, and arrange for faculty members representing at least 2 of these disciplines to provide supervision. Projects are subject to the approval of the department(s) or school(s) concerned and must be submitted to the appropriate chair(s) or director(s) by the end of the course selection period prior to beginning the course. Subject to approval, this course may be accepted as credit towards an honours major in Art History, Drama, English, Studio Art, French, History, German, Italian, Spanish, Classical Languages, Classical Studies, Music and Philosophy. This is a two-semester course offered over consecutive semesters. When you select it you must select HUMN\*3501 in the Fall semester and HUMN\*3502 in the Winter semester. A grade will not be assigned to HUMN\*3501 until HUMN\*3502 has been completed.

#### **HUMN\*3502 Independent Interdisciplinary Research Project W (3-0) [0.50]**

Second part of the two-semester course HUMN\*3501/2. Refer to HUMN\*3501/2 for course description.

## Interdisciplinary Physical Science

<b>IPS*4001 Chemical Physics Research Project F (0-9) [0.75]</b>
<p>First part of the two-semester course IPS*4001/2. Refer to IPS*4001/2 for course description.</p> <p><i>Prerequisite(s):</i> (CHEM*3870 or CHEM*4880), PHYS*3100 (of which CHEM*3870 may be taken concurrently)</p> <p><i>Restriction(s):</i> Instructor consent required.</p>
<b>IPS*4001/2 Chemical Physics Research Project F-W [1.50]</b>
<p>A two-semester research project supervised by a faculty member from Physics or from Chemistry and Biochemistry, or by a pair of faculty members spanning the 2 departments in order to expand cross disciplinary opportunities. Students will participate in the seminar and reporting activities of either CHEM*4900, CHEM*4910 or PHYS*4500, PHYS*4510 , and may utilize modules from PHYS*4500 as preparation if necessary. This is a two-semester course offered over consecutive semesters. When you select it you must select IPS*4001 in the Fall and IPS*4002 in the Winter semester. A grade will not be assigned to IPS*4001 until IPS*4002 has been completed.</p> <p><i>Prerequisite(s):</i> (CHEM*3870 or CHEM*4880), PHYS*3100 (of which CHEM*3870 may be taken concurrently)</p> <p><i>Restriction(s):</i> Instructor consent required.</p>
<b>IPS*4002 Chemical Physics Research Project W (0-9) [0.75]</b>
<p>Second part of the two-semester course IPS*4001/2. Refer to IPS*4001/2 for course description.</p> <p><i>Prerequisite(s):</i> IPS*4001</p>

## Interdisciplinary Social Science

### *College of Social and Applied Human Sciences*

#### **ISS\*2000 Asia U (3-0) [0.50]**

This course will survey China and/or India, noting the major historical trends, cultural factors, economic systems, and political institutions and political processes. Department of Political Science.

#### **ISS\*2990 Introduction to Marx W (3-0) [0.50]**

An interdisciplinary course designed to acquaint students with the thought of Karl Marx. Departments of History, Philosophy, Political Science and Sociology and Anthropology.

#### **ISS\*3100 London Studies in the Social Sciences W (2-3) [0.50]**

An integrated course of studies in the social sciences as they relate to the resources of London. For London Semester students only.

*Restriction(s):* Admission to the London Semester.

#### **ISS\*3150 Paris Studies in the Social Sciences W (2-0) [0.50]**

An integrated course of studies in the social sciences as they relate to the resources of Paris. For Paris Semester students only.

*Restriction(s):* Admission to the Paris Semester.

#### **ISS\*3250 Krakow Studies in the Social Sciences I F (3-2) [0.50]**

An integrated course of studies in the social sciences as they relate to the resources in Krakow, Poland. For Krakow students only.

*Restriction(s):* Admission to the Krakow Semester.

#### **ISS\*3260 Krakow Studies in the Social Sciences II F (3-2) [0.50]**

An integrated course of studies in the social sciences as they relate to the resources in Krakow, Poland. For Krakow students only.

*Restriction(s):* Admission to Krakow Semester.

#### **ISS\*3270 India Studies in the Social Sciences W (3-0) [0.50]**

An integrated course of studies in the social sciences as they relate to India. This course looks at selected aspects of one or more areas in the social, geographic, economic and political aspects of Indian society. For India Semester students only.

*Restriction(s):* Admission to the India Semester.

#### **ISS\*3300 Latin American Studies in the Social Sciences W (1-2) [0.50]**

An integrated course of studies in the social sciences as they relate to the resources of Latin America.

*Restriction(s):* Admission to the Latin America semester, consent of the instructor and satisfactory participation in a bi-weekly preparation seminar during the fall semester.

#### **ISS\*3420 Women Social and Political Theorists W (3-0) [0.50]**

The writings of seventeenth and nineteenth century women social and political theorists will be explored as contributing to the development of classical and contemporary social and political theory. These women wrote on status of women and gender role issues as well as dealing with such fundamental matters as the nature and origin of society/social contract, political rights and obligations, government, constitutional change, revolution, slavery, socialism, the welfare state, imperialism and racism. An important feature of the course would be to show women theorists' contributions on central political interests and the integration of gender issues with those of class and race. Department of Sociology and Anthropology and Department of Political Science.

*Prerequisite(s):* SOAN\*211 1/2 or POLS\*2000

*Restriction(s):* Not available to students in Anthropology, Criminal Justice & Public Policy or Sociology areas of study.

## Interdisciplinary University

UNIV\*3500 , UNIV\*3550 and UNIV\*4500 are re-numbered and now appear under Environmental Design and Rural Development (EDRD)

### UNIV\*1200 First Year Seminar W (3-0) [0.50]

First Year Seminars are interdisciplinary courses designed especially for first year students. The goal of the First Year Seminar course is to provide opportunities for students to participate in small enrolment, discussion-oriented classes in their first year. Different seminar topics are offered each year in each separate course section, reflecting the particular research or professional interest of the course instructor. The seminar course counts as a free elective in the student's Schedule of Studies. For information about how the seminar courses may in some cases fulfil particular program distribution requirements, students should contact their program counsellor. A list of current and archived offerings is available by following the links on the [First Year Seminars](#) web page.

*Restriction(s):* Fewer than 5.00 credits.

### UNIV\*1250 Experiential Learning Opportunity I: Peer Helper U (0-0) [0.00]

Open only to students who have been accepted into the Peer Helper program. This 0.00 credit course recognizes the successful completion of the Peer Helper training program and a supervised field experience in an approved Peer Helper placement. A pass/fail grade will not be assigned to UNIV\*1250 until UNIV\*1260 has been completed. Students who wish to enroll in this course should see Student Life and Career Services for more information.

*Restriction(s):* Instructor consent required and acceptance in the Peer Helper program.

### UNIV\*1260 Experiential Learning Opportunity II: Peer Helper U (0-0) [0.00]

Open only to students who have been accepted into the Peer Helper program. This 0.00 credit course recognizes the successful completion of the Peer Helper training program and a supervised field experience in an approved Peer Helper placement. A pass/fail grade will be assigned at the end of the completion of both UNIV\*1250 and UNIV\*1260. Student who wish to enroll in this course should see Student Life and Career Services for more information.

*Prerequisite(s):* UNIV\*1250

### UNIV\*2050 Environmental Perspectives and Human Choices I F (3-0) [0.50]

An interdisciplinary approach to environmental issues which offers opportunities to investigate social processes and philosophical considerations with respect to the position and influence of humankind, and the development of social conditions, values and economic activities that have led to our present situation. These investigations are carried out within the context of physical environmental considerations, such as the state of the earth, forests, air water and our use of energy, and will lead the student to a detailed consideration of the future. (Offered through Distance Education format only.)

### UNIV\*2250 Experiential Learning Opportunity III: Peer Helper U (0-0) [0.00]

Open only to students who have been accepted into the Peer Helper program. This 0.00 credit course recognizes the successful completion of the Peer Helper training program and a supervised field experience in an approved Peer Helper placement. A pass/fail grade will not be assigned to UNIV\*2250 until UNIV\*2260 has been completed. Students who wish to enroll in this course should see Student Life and Career Services for more information.

*Prerequisite(s):* UNIV\*1250, UNIV\*1260

### UNIV\*2260 Experiential Learning Opportunity IV: Peer Helper U (0-0) [0.00]

Open only to students who have been accepted into the Peer Helper program. This 0.00 credit course recognizes the successful completion of the Peer Helper training program and a supervised field experience in an approved Peer Helper placement. A pass/fail will be assigned at the end of the completion of both UNIV\*2250 and UNIV\*2260. Students who wish to enroll in this course should see Student Life and Career Services for more information.

*Prerequisite(s):* UNIV\*2250

### UNIV\*3000 Civic Engagement & Service Learning W (3-0) [0.50]

This course provides a unique opportunity for students to develop civic leadership skills and increase their awareness and appreciation for the social relevance of higher education through a community service-learning experience. Curricular and co-curricular learning are integrated through continued academic study and its application, modification, and critique in a community context. Students will conduct research and seminars on a selected topic while simultaneously completing a placement in a community agency appropriate to that topic.

*Prerequisite(s):* 9.00 credits

### UNIV\*3010 University Studies in London I U (3-0) [0.50]

This course is an intensive and integrated study in the arts, social sciences and/or sciences as they relate to the resources of London. This course is for London Session Semester students only.

*Prerequisite(s):* Admission to the London Semester.

### UNIV\*3020 University Studies in London II U (3-0) [0.50]

This course is an intensive and integrated study in the arts, social sciences and/or sciences as they relate to the resources of London. This course is for London Session Semester students only.

*Prerequisite(s):* Admission to the London Semester.

### UNIV\*3150 University Studies in Paris I W (2-3) [0.50]

An integrated course of study in subject areas that will vary from year to year but relate to resources in Paris.

*Prerequisite(s):* Admission to the Paris Semester.

### UNIV\*3160 University Studies in Paris II W (2-3) [0.50]

An integrated course of study in subject areas that will vary from year to year but relate to resources in Paris.

*Prerequisite(s):* Admission to the Paris Semester.

### UNIV\*3170 University Studies in Paris III W (2-3) [0.50]

An integrated course of study in subject areas that will vary from year to year but relate to resources in Paris.

*Prerequisite(s):* Admission to the Paris Semester.

### UNIV\*3210 Contemporary China F (3-3) [1.00]

The course focuses on aspects of Shanghai as exemplifying the emergence of contemporary China. The course engages perspectives from the humanities and social sciences.

*Prerequisite(s):* Admission to the Shanghai semester.

*Restriction(s):* Instructor consent required.

### UNIV\*3220 University Studies in Shanghai I F (3-0) [0.50]

This is an intensive and integrated course which focuses on a topic relating to Shanghai.

*Prerequisite(s):* Admission to the Shanghai semester.

*Restriction(s):* Instructor consent required.

### UNIV\*3230 University Studies in Shanghai II U (3-0) [0.50]

This is an intensive and integrated course which focuses on a topic relating to Shanghai.

*Prerequisite(s):* Admission to the Shanghai semester.

*Restriction(s):* Instructor consent required.

### UNIV\*3250 Environmental Perspectives and Human Choices II W (3-0) [0.50]

The complexity and dimensions of key environmental issues introduced in UNIV\*2050 are explored in greater detail. This will facilitate the student's ability to critically evaluate socio-economic-environmental linkages between contemporary challenges such as sustainable resources, energy, human population, education and communication, and environmental ethics. Supplementary voluntary workshop. (Offered through Distance Education format only.)

*Prerequisite(s):* UNIV\*2050

### UNIV\*3330 Confronting Science and Politics W (6-0) [1.00]

Using an enquiry-based approach, this course will present students with a number of critical global issues where science and politics collide. Students will be expected to research and understand the scientific, political and cultural issues that underlie the problems and identify tangible, real-world, and effective action or resolution. Students will practise oral and written forms of communication to explore issues of science, politics, culture, environment, humanitarianism and health.

*Prerequisite(s):* 7.50 credits including (1 of PSYC\*2040, STAT\*2040, STAT\*2060, STAT\*2080, STAT\*2100 )

*Restriction(s):* Instructor Consent.

## Integrative Biology

### IBIO\*4500 Research in Integrative Biology I F,W (1-5) [0.75]

The student will undertake an independent research project of a practical or theoretical nature that relates either to organismal biology or the teaching of organismal biology and is conducted under the supervision of a faculty member. Students must make arrangements with both a faculty supervisor and the course coordinator at least one semester in advance. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the project is to be completed.

*Equate(s):* ZOO\*4490 , ZOO\*4500 , BOT\*4820

*Restriction(s):* Normally a minimum cumulative average of 70% in the biology courses during the first 6 semesters of a major in the College of Biological Science. Instructor consent required.

### IBIO\*4510 Research in Integrative Biology II F,W (1-5) [0.75]

The student will undertake an independent research project of a practical or theoretical nature that relates either to organismal biology or the teaching of organismal biology and is conducted under the supervision of a faculty member. Students must make arrangements with both a faculty supervisor and the course coordinator at least one semester in advance. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the project is to be completed.

*Prerequisite(s):* IBIO\*4500

*Equate(s):* ZOO\*4510 , BOT\*4830

*Restriction(s):* Normally a minimum cumulative average of 70% in the biology courses during the first 6 semesters of a major in the College of Biological Science. Instructor consent required.

### IBIO\*4521 Thesis in Integrative Biology F (0-12) [1.00]

This course is the first part of the two semester course IBIO\*4521/2. Refer to IBIO\*4521/2 for course description. This is a two semester course offered over consecutive semesters F-W. When you select this course, you must select IBIO\*4521 in the Fall semester and IBIO\*4522 in the Winter semester. A grade will not be assigned to IBIO\*4521 until IBIO\*4522 has been completed.

*Prerequisite(s):* 12.00 credits

*Restriction(s):* Normally a minimum cumulative average of 75% in the biology courses over the first 6 semesters of a major in the College of Biological Science and permission of course coordinator.

### IBIO\*4521/2 Thesis in Integrative Biology F-W [2.00]

This course is a two semester (F,W) undergraduate Thesis project in which students conduct a comprehensive, independent research project in organismal biology under the supervision of a faculty member. Projects must be planned in advance and involve a thorough literature review, a research proposal, original research of publication quality and a written Thesis, which is assessed through an oral presentation and defence. Students must make arrangements with both a faculty supervisor and the course coordinator at least one semester in advance. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the project is to be initiated. This is a two semester course offered over consecutive semesters F-W. When you select this course, you must select IBIO\*4521 in the Fall semester and IBIO\*4522 in the Winter semester. A grade will not be assigned to IBIO\*4521 until IBIO\*4522 has been completed.

*Prerequisite(s):* 12.00 credits

*Restriction(s):* Normally a minimum cumulative average of 75% in the biology courses over the first 6 semesters of a major in the College of Biological Science and permission of course coordinator.

### IBIO\*4522 Thesis in Integrative Biology W (0-12) [1.00]

This course is the second part of the two semester course IBIO\*4521/2. Refer to IBIO\*4521/2 for course description. This is a two semester course offered over consecutive semesters F-W. When you select this course, you must select IBIO\*4521 in the Fall semester and IBIO\*4522 in the Winter semester. A grade will not be assigned to IBIO\*4521 until IBIO\*4522 has been completed.

*Prerequisite(s):* IBIO\*4521

## International Development

### IDEV\*2500 International Development Studies W (4-0) [0.75]

This course is an introduction to a broad range of topics in international development as studied by various researchers and from perspectives of different social-science disciplines. Special emphasis will be placed on research arising from the seven areas of emphasis in the undergraduate IDS program, the integration of diverse disciplines and paradigms, and the implications for public policy. Students in the International Development major should complete this course before semester five.

*Prerequisite(s):* POLS\*2080, (ANTH\*1150 or ECON\*1050)

*Equate(s):* IDEV\*2010

*Restriction(s):* Registration in B.A. International Development major, minor or area of concentration.

### IDEV\*3010 Case Studies in International Development F,W (3-0) [0.50]

This course is an in-depth examination of select case studies in international development.

*Prerequisite(s):* 10.00 credits including IDEV\*2010 or IDEV\*2500

*Restriction(s):* Registration in B.A. International Development major. Minimum of 68% overall cumulative average.

### IDEV\*3200 Individual Work/Study in International Development S,F,W (3-0) [0.50]

This course is intended for students who seek to combine work and study in development with their academic course work. It may be used in connection with internships or work at international development agencies or other appropriate businesses and organizations (in Canada and abroad), for research and/or experience in a developing country, or for other practica or programs. Any faculty member at the University of Guelph with appropriate expertise may supervise the work/study project. In each case, the student and faculty member will agree on an outline of the work/study project and evaluation criteria. In all cases the project will involve a writing component.

*Prerequisite(s):* 10.00 credits

*Restriction(s):* Written approval of the faculty advisor for International Development.

### IDEV\*4190 Regional Context S,F,W (1.5-0) [0.25]

In this course students will learn about a region that they intend to study further in an advanced work/study project (IDEV\*4200) or in a structured semester abroad. It may be offered as a reading course or as a seminar.

*Prerequisite(s):* 10.00 credits including IDEV\*2010 or IDEV\*2500

*Restriction(s):* Written approval of the faculty advisor for International Development.

### IDEV\*4200 Advanced Work/Study in International Development S,F,W (3-0) [0.75]

Individual work/study option at an advanced level. See IDEV\*3200 for course description.

*Prerequisite(s):* IDEV\*4190

*Restriction(s):* Written approval of the faculty advisor for International Development.

### IDEV\*4500 International Development Seminar F,W (3-0) [0.75]

This course brings together students in international development in their final year of study to examine key debates and to integrate knowledge from different areas of emphasis in the specialization. Students draw from a variety of disciplinary and inter-disciplinary perspectives in lectures, text-based seminars and in reaction to guest speakers. In addition, students develop and present research projects which focus theoretical insight on practical concerns.

*Prerequisite(s):* 15.00 credits

*Restriction(s):* Registration in B.A. International Development major. Minimum of 68% overall cumulative average. Written approval of the faculty advisor for International Development.



## Italian Studies

### *School of Languages and Literatures*

*Note: Literary texts are, at all levels, studied in the original language. Students registering in these courses will be expected to have the appropriate knowledge.*

#### **ITAL\*1060 Introductory Italian I F (3-1) [0.50]**

A beginning course in Italian providing the fundamentals of grammar, structure and idiom. Introduction to aspects of Italian life and culture through audio-visual aids. (This course may not be taken by students who have credit for 12U Italian or equivalent.)

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

#### **ITAL\*1070 Introductory Italian II W (3-1) [0.50]**

This course is a continuation of ITAL\*1060. In addition to basic grammar and composition, texts from contemporary culture are introduced. (This course may not be taken by students who have OAC Italian or equivalent.)

*Prerequisite(s):* ITAL\*1060

#### **ITAL\*2050 Introduction to Literature W (2-1) [0.50]**

This course introduces students to the scholarly study of literature, including critical commentaries. The course focuses on the notion of a European literary tradition in which works by German and Italian authors are key. The lectures are in English, but students taking the course under this code will read texts originally written in Italian in the original language and German works in Italian translation. Students will submit some work in Italian.

*Prerequisite(s):* ITAL\*2090

*Restriction(s):* GERM\*2050

#### **ITAL\*2090 Intermediate Italian F (5-0) [1.00]**

An intensive language course that continues the grammar begun at the introductory level while introducing additional speaking, listening, and writing practice.

*Prerequisite(s):* ITAL\*1070

*Restriction(s):* ITAL\*2060 , ITAL\*2070

#### **ITAL\*2100 Renaissance Lovers and Fools W (3-1) [0.50]**

In this course, students will read Italian Renaissance plays such as Machiavelli's "The Mandrake" and Bibbiena's "Calandria" with special attention to the portrayals of lovers and fools. The course will place particular emphasis on representations of class and gender relations. Additional readings will provide background and context for the plays. Lectures and texts are in English. Students registered in ITAL\*2100 will meet a fourth hour per week to discuss texts in Italian. This course is offered in conjunction with HUMN\*2100 . (Offered in odd-numbered years.)

*Prerequisite(s):* ITAL\*1070 or permission of instructor

*Restriction(s):* ITAL\*3280 , HUMN\*2100

#### **ITAL\*3060 Advanced Italian F (3-0) [0.50]**

This course will combine Italian grammar, composition, and translation with Italian literature and film. While addressing aspects of modern and contemporary Italian literature, history and culture, the course will teach students to understand spoken Italian, to converse, and to communicate in written Italian at an advanced level.

*Prerequisite(s):* ITAL\*2070 or ITAL\*2090

#### **ITAL\*3150 Medieval Italian Literature F (3-0) [0.50]**

A study of Dante, Petrarch, and Boccaccio. (Offered in even-numbered years.)

*Prerequisite(s):* ITAL\*2070 or ITAL\*2090

#### **ITAL\*3200 Novels of Resistance W (3-0) [0.50]**

In this course, students will read Italian novels such as Alberto Moravia's "Gli indifferenti", Italo Calvino's "Il sentiero dei nidi di ragno", and Dacia Maraini's "Donna in guerra" with particular attention to the theme of resistance. The course will consider representations of fascism, patriarchy, and the bourgeois ethos and the ways in which writers envision the possibility of resistance to them. (Offered in even-numbered years.)

*Prerequisite(s):* 1 of ITAL\*2070 , ITAL\*2090, permission of instructor

*Restriction(s):* ITAL\*2350

#### **ITAL\*3400 Renaissance Lovers and Fools W (3-0) [0.50]**

In this course, students will read Italian Renaissance plays such as Machiavelli's "The Mandrake" and Bibbiena's "Calandria" with special attention to the portrayals of lovers and fools. The course will place particular emphasis on representations of class and gender relations. Additional readings in medieval literature, history, and critical theory will provide background and context for the plays. Lectures and texts are in English. Students registered in ITAL\*3400 will meet a fourth hour per week to discuss texts in Italian. This course is offered in conjunction with HUMN\*3400.

*Prerequisite(s):* ITAL\*2090

*Co-requisite(s):* HUMN\*3400

*Restriction(s):* ITAL\*2100, HUMN\*2100

#### **ITAL\*3950 Topics in Italian Literature W (3-0) [0.50]**

Aspects of Italian literature. Each offering will treat a particular topic such as early texts in the Vernacular, Commedia dell'Arte, Eighteenth-Century Drama, realism in Italian Literature, the poetry of Montale, Ungaretti, and Saba. (Offered in even-numbered years.)

*Prerequisite(s):* ITAL\*3060

#### **ITAL\*3960 Topics in Italian Literature F (3-0) [0.50]**

Each offering will treat a particular topic such as early texts in the Vernacular, Commedia dell'Arte, Eighteenth-Century Drama, realism in Italian Literature, the poetry of Montale, Ungaretti, and Saba.

*Prerequisite(s):* ITAL\*3060

#### **ITAL\*3970 Topics in Italian Literature W (3-0) [0.50]**

Each offering will treat a particular topic such as early texts in the Vernacular, Commedia dell'Arte, Eighteenth-Century Drama, realism in Italian Literature, the poetry of Montale, Ungaretti, and Saba. (Offered in odd-numbered years.)

*Prerequisite(s):* ITAL\*3060

#### **ITAL\*4900 Research Paper in Italian Studies F,W (3-0) [0.50]**

This is the equivalent of a semester course. A research project on some aspect of Italian language, literature, or thought. The topic must be approved by the section; the paper will be written under the regular guidance of a faculty advisor.

*Prerequisite(s):* Restricted to the 6th semester in the Italian honours program.

## Landscape Architecture

### *School of Environmental Design and Rural Development*

#### **LARC\*1100 Design and Communications Studio F (3-3) [0.75]**

An introduction to the physical design professions with emphasis on the role of landscape architects. Emphasis on development of design awareness, process, communication skills and creativity.

*Restriction(s):* Registration in the B.L.A. program.

#### **LARC\*1950 History of Cultural Form I F (3-0) [0.50]**

This course explores the cultural form expressed in landscapes from ancient times to the present.

#### **LARC\*2020 Design Studio W (2-4) [0.75]**

An examination of the theory, process and vocabulary of spacial design. An exploration of the social, psychological, and behavioural forces a designer must respond to. An introduction to landscape analysis.

*Prerequisite(s):* LARC\*1100

*Restriction(s):* Registration in the B.L.A. program.

#### **LARC\*2100 Landscape Analysis F (2-2) [0.50]**

A study of biophysical factors and their influence on design. Including soils, climate, vegetation, hydrology, and fauna. Natural and cultural systems interpretation, site assessment methods, and data presentation techniques will be outlined. Students will formulate and conduct site assessments that include resource inventories and the analysis for land use suitability.

*Prerequisite(s):* LARC\*2020

*Co-requisite(s):* LARC\*3040 or registration in the U.L.M. B.Sc. (Agr.) program and 5.00 credits

#### **LARC\*2230 Planting Design W (1-2) [0.50]**

This course covers the visual and physical characteristics of plants and their use. Students will study design theory and its application at a site specific scale and the use of plants in a wide range of applications.

*Co-requisite(s):* LARC\*2020

*Restriction(s):* Registration in the B.L.A. Program.

#### **LARC\*2240 Plants in the Landscape F (1-2) [0.50]**

This course explores the identification and cultural requirements of native and introduced plants in cultivated and naturalized landscapes from a design perspective.

*Prerequisite(s):* LARC\*2230

*Restriction(s):* LARC\*2340 Registration in the B.L.A. Program.

#### **LARC\*2410 Site Engineering F (3-1) [0.50]**

A focus on contour grading to facilitate circulation, stormwater runoff, and design intent. Aspects of surveying, plotting, as well as runoff and cut and fill calculations.

*Prerequisite(s):* LARC\*2020, LARC\*2420

#### **LARC\*2420 Materials and Techniques W (3-0) [0.50]**

The study of materials commonly used for landscape construction. Specification of procedures and materials for contractual purposes. Detail drafting.

*Prerequisite(s):* LARC\*1100

#### **LARC\*2820 Urban and Regional Planning W (3-0) [0.50]**

Introduction to the evolution and history of planning and its conceptual base. A study of the theoretical foundations of planning. Emphasis on the Canadian scene and on Canadian planning literature.

#### **LARC\*3040 Site Planning and Design Studio F (2-4) [0.75]**

Application of the site planning process, including programming, site analysis, functional analysis and diagramming. Application of design theory and landscape analysis to site design.

*Prerequisite(s):* LARC\*2020

*Co-requisite(s):* LARC\*2100, LARC\*2240

#### **LARC\*3050 Landscape Architecture I W (2-4) [0.75]**

Lectures and projects emphasizing the integration of design theory, skills and knowledge using site scale and urban design projects. Highlighting the use of contemporary history.

*Prerequisite(s):* LARC\*3040

#### **LARC\*3060 Landscape Architecture II F (2-4) [0.75]**

Application of the landscape architectural design process to conservation, development and rehabilitation of landscapes. Projects at an intermediate scale focusing on biophysical, cultural and visual resources as primary design determinants. Emphasis on secondary research, analysis, program development, alternative concepts and design master planning.

*Prerequisite(s):* LARC\*3050

#### **LARC\*3070 Landscape Architecture III F (2-6) [1.00]**

Exercises in regional scale design and master planning to provide an understanding of the integrative design process that considers ecological, technological, socio-economic, human and aesthetic factors in the land development process. Projects focus on land planning, community design, urban design, and public involvement and communication.

*Prerequisite(s):* LARC\*3060

#### **LARC\*3320 Principles of Landscape Ecology F (3-0) [0.50]**

This course offers an integrated approach to understanding the functioning of landscapes. The emerging theories, concepts and methodologies of landscape science and their application to landscape and environmental management will be discussed.

*Co-requisite(s):* 1 of BIOL\*2060, BIOL\*3110, GEOG\*2110, LARC\*2100

*Restriction(s):* ENVS\*3320

#### **LARC\*3430 Landscape Construction I W (2-4) [0.50]**

Lectures and studio exercises that integrate construction documentation with design. The technical procedures needed to direct design implementation including layout, grading, utility design, and planting plans.

*Prerequisite(s):* LARC\*2410

#### **LARC\*3440 Landscape Construction II F (2-4) [0.75]**

Production of construction drawings, documents and cost estimates using computer and manual techniques.

*Prerequisite(s):* LARC\*3430

*Co-requisite(s):* LARC\*3060

#### **LARC\*3500 Independent Study S,F,W (0-6) [0.50]**

Each student establishes, in consultation with the faculty member chosen, the content of special study within the area of expertise of that instructor.

*Prerequisite(s):* LARC\*3040

#### **LARC\*4090 Seminar W (3-0) [0.50]**

An integrated overview of professional issues involving practice, ethics, environmental concerns, government policy, research needs and professional responsibilities to society. Emphasis on writing and oral presentations.

*Prerequisite(s):* LARC\*3060

#### **LARC\*4510 Honours Thesis F (3-0) [0.50]**

Students will select significant problems related to landscape architecture and explore the scholarship related to problem identification and resolution. The aim of the course is to allow students to integrate knowledge and skills acquired in preceding courses and produce a major paper.

*Prerequisite(s):* LARC\*3050, LARC\*3440

#### **LARC\*4520 Park and Recreation Administration W (3-0) [0.50]**

A study of the major objectives, policies and administrative practices of the principal park and recreation agencies at various levels of government, with an emphasis on trends and implications for future roles and administrative policies of these agencies. (Offered in odd-numbered years.)

*Prerequisite(s):* 1.00 credits at the 2000 level in social sciences or three semesters of the B.L.A. program

#### **LARC\*4610 Professional Practice F (3-0) [0.50]**

Lectures and assignments dealing with professional ethics, organizations, contract law and procedures, relationships with clients, contractors and professional practitioners, office procedure and professional promotion practices and trends.

*Prerequisite(s):* LARC\*3050

#### **LARC\*4620 Internship in Landscape Architecture S,F,W (0-10) [1.00]**

An experiential learning opportunity requiring professional office experience and faculty supervision under program regulations. Actual work experience for academic credit. Students are required to submit a project or paper as part of the course requirements.

*Prerequisite(s):* LARC\*3060, LARC\*3440

#### **LARC\*4710 Integrative Design Studio W (2-6) [1.00]**

In this capstone design studio students integrate the skills and knowledge obtained in previous courses to produce a comprehensive final design project relating to a significant social and environmental problems. Students are encouraged to select problems that require an interdisciplinary approach.

*Prerequisite(s):* LARC\*4510

#### **LARC\*4730 Special Study in Landscape Architecture S,F,W (0-4) [0.50]**

Supervised independent study involving competitions, special projects, modules, and other formats.

*Prerequisite(s):* LARC\*3050

**LARC\*4740 Case Studies S,F,W (0-6) [0.50]**

Travel and field studies of selected projects as approved by a faculty member. Students are required to submit a project or paper.

*Prerequisite(s):* LARC\*3040

## Latin

### *School of Languages and Literatures*

*Note: Literary texts are, at all levels, studied in the original language. Students registering in these courses will be expected to have the appropriate knowledge. Higher level courses in Latin are available as language modules attached to selected Classical Studies courses which are taken as double-weighted courses. (See Classical Studies course descriptions.)*

#### **LAT\*1100 Preliminary Latin I F (3-0) [0.50]**

A beginning course in Latin providing the fundamentals of structure and grammar. (This course may not be taken by anyone who has Grade 12 Latin).

#### **LAT\*1110 Preliminary Latin II W (3-0) [0.50]**

A continuation of LAT\*1100.

*Prerequisite(s):* LAT\*1100 or Grade 12 Latin

#### **LAT\*2000 Latin Literature F (3-0) [0.50]**

A course in Latin literature based on relevant texts.

*Prerequisite(s):* Grade 12 Latin or LAT\*1110

#### **LAT\*4100 Directed Readings in Latin Literature F (3-0) [0.50]**

A reading course in Latin Literature designed according to the needs and the interests of the individual student.

*Prerequisite(s):* 1 of CLAS\*3060, CLAS\*3120, CLAS\*3300

#### **LAT\*4150 Research Paper: Latin F,W (3-0) [0.50]**

A major essay on an area of study to be determined in consultation with the Classics Faculty in the School.

*Prerequisite(s):* CLAS\*3060 or CLAS\*3120

## Linguistics

*School of Languages and Literatures*

<b>LING*1000 Introduction to Linguistics W (3-0) [0.50]</b>
The nature of language. An elementary survey of linguistic disciplines. Phonetics, morphology, syntax, semantics, language, and society.

## Management

*Department of Business*

*Department of Marketing and Consumer Studies*

*School of Hospitality and Tourism Management*

### **MGMT\*1000 Introduction to Business F (3-0) [1.00]**

This course is intended for B.Comm. students in semester one. It provides students with an understanding of the evolution of forms of business organization and their role in social and economic development. The main focus is on current economic, social and environmental issues that impact business organizations and which, in turn, are impacted by business decisions. Ethical considerations and the concept of sustainability are essential components. Students develop oral and written communication skills in small seminar groups. Department of Marketing and Consumer Studies.

*Restriction(s):* CME\*1000 . Registration in B.Comm. and fewer than 7.50 credits.

### **MGMT\*2150 Introduction to Canadian Business Management U (3-0) [0.50]**

This is an introductory course in the fundamentals of business management in Canada. Students will be exposed to the basic functions of business and management. This course will also cover small business and entrepreneurship, forms of business ownership, competing in the global business environment and the economic and political realities of business in Canada today. This course may not be taken for credit by Bachelor of Commerce students. (Offered through Distance Education format only.) School of Hospitality and Tourism Management.

*Equate(s):* HTM\*2150

*Restriction(s):* B.Comm. students cannot take this course for credit.

### **MGMT\*3020 Corporate Social Responsibility F (3-0) [0.50]**

This course provides students an opportunity to examine a comprehensive range of topics and issues related to business and sustainability and aims to explore the implications of changing stakeholder expectations, and opportunities for organizational sustainable value creation. Key topics will include CSR theories and frameworks, global issues and role of business in society, socially responsible investing, green consumption, CSR and firm competitive advantage, reputation, corporate governance and ethics, regulation and social/environmental reporting. Department of Business

*Prerequisite(s):* BUS\*2090 or HROB\*2100

*Equate(s):* BUS\*3020

*Restriction(s):* This is a Priority Access Course for students in the B.Comm. and B.A. Environmental Governance (EGOV) programs. Some restrictions may apply during some time periods. Please contact the department for more information.

### **MGMT\*4000 Strategic Management F,W (6-0) [1.00]**

Strategic management is a synthesis of the principles of business management with emphasis upon the formation of business decisions and policies. The purpose of this course is to enable the student to draw on analytical tools and factual knowledge from other courses in analyzing comprehensive business problems and establishing viable plans and methods to implement the developed plans of action. (First offering - Fall 2014) Department of Business.

*Prerequisite(s):* (ECON\*2560 or ECON\*3560), (1 of AGE\*3320 , AGE\*3400 , BUS\*3320, FARE\*3400), (1 of AGE\*3310 , FARE\*3310, HTM\*3120)

*Restriction(s):* BUS\*4250, HTM\*4200, Restricted to students in B.Comm. Priority Access course. See department for more information.

### **MGMT\*4050 Applied Community Project I F,W (3-0) [0.50]**

Offered through the Centre for Business and Social Entrepreneurship (CBaSE), the project-based independent study option is designed to provide senior undergraduate students with an opportunity to pursue an applied course of study while engaging with the local community. The topic selected will be determined in agreement between the student and the faculty member with expertise in the area. Department of Marketing and Consumer Studies.

*Equate(s):* 10.00 credits, minimum 70% cumulative average

*Restriction(s):* Restricted to students in B.Comm. Instructor consent required.

### **MGMT\*4060 Applied Community Project II F,W (3-0) [0.50]**

Offered through the Centre for Business and Social Entrepreneurship (CBaSE), the project-based independent study option is designed to provide senior undergraduate students with an opportunity to pursue an applied course of study while engaging with the local community. The topic selected will be determined in agreement between the student and the faculty member with expertise in the area. Department of Marketing and Consumer Studies.

*Equate(s):* 10.00 credits, minimum 70% cumulative average

*Restriction(s):* Restricted to students in B.Comm. Instructor consent required.

### **MGMT\*4260 International Business W (3-0) [0.50]**

This course covers international business and deals with the strategic and functional areas of management in the international business environment. This course examines the factors that shape strategic management outside a firm's domestic markets. It uses a mix of readings, lectures, case studies, individual and group projects. Department of Business.

*Prerequisite(s):* 14.50 credits

*Equate(s):* BUS\*4240

*Restriction(s):* Priority Access course. Enrolment may be restricted to particular programs or specializations. See department for more information.

## Marketing and Consumer Studies

*Department of Marketing and Consumer Studies*

*For courses without semester designations, please check with the department. Advance schedules are available in the department.*

### **MCS\*1000 Introductory Marketing S,F,W (3-0) [0.50]**

This course covers the marketing of both products and services. Students will be introduced to the theoretical concepts through lectures and class discussions and have the opportunity to apply these concepts through case analysis and discussion. (Also offered through Distance Education format.)

*Equate(s):* COST\*1000

*Restriction(s):* Registration in B.Comm. programs, BA MKMN minor, BA BADM minor, BA European Studies area of emphasis in European Business Studies, or BBRM EQM. This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information. This course may not be taken for credit subsequent to receiving credit in 1 of AGE\*4370, FARE\*4370, HTM\*3080.

### **MCS\*2000 Business in a Changing World F (3-0) [0.50]**

This course provides an overview of business by reviewing and discussing key issues (such as business communication, ethics and globalization), and the components of a business plan. Weekly lectures are supplemented by discussions of business cases and hand-in assignments designed to introduce students to basic business skills

*Prerequisite(s):* 5.00 credits including MCS\*1000

*Restriction(s):* Registration in B.Comm. MKMN or B.Comm. MKMN:C

### **MCS\*2020 Marketing Information Management F,W (3-0) [0.50]**

In this course students are introduced to the concepts and principles of information acquisition, manipulation and management as relevant to organizational decision-making. Experience in the evaluation of information technology applications used in organizations is provided. (Also offered through Distance Education format.)

*Prerequisite(s):* 5.00 credits including MCS\*1000

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information. Not available to students registered in B.Comp program or CIS majors and minors.

### **MCS\*2100 Personal Financial Management S,F,W (3-0) [0.50]**

This introductory course is designed to help students develop and achieve their personal goals in financial management. (Offered through Distance Education only.)

*Prerequisite(s):* 5.00 credits

*Equate(s):* COST\*2100

### **MCS\*2600 Fundamentals of Consumer Behaviour F,W (3-0) [0.50]**

Organizations survive and achieve their goals by satisfying the needs and wants of consumers as well as or better than their competitors. This course examines consumer behaviours, the economic, social, cultural and psychological factors related to consumer behaviours, the evolution and change in behaviours and relationships, and the ways in which consumers respond to stimuli employed in the marketing of products, services and ideas.

*Prerequisite(s):* (1 of HAF\*1000, HTM\*1000, MCS\*1000), (HROB\*2100 or PSYC\*1200). Although not required, it is recommended that students take PSYC\*1200 prior to MCS\*2600.

*Restriction(s):* Registration in B.Comm. programs, BA MKMN minor, or BA European Studies area of emphasis in European Business Studies. This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

### **MCS\*3000 Advanced Marketing F (3-0) [0.50]**

This course provides students with an opportunity to extend their knowledge of the marketing principles and strategies they learned in MCS\*1000 to develop a marketing plan and to explore sales as a career.

*Prerequisite(s):* 10.00 credits including MCS\*1000

*Restriction(s):* Not available to B.Comm. students registered in MKMN, MKMN:C, AGBU, AGBU:C majors.

### **MCS\*3010 Quality Management W (3-0) [0.50]**

Lectures will include general concepts and expectations of quality assurance from consumer, government, managerial and technological points of view and discuss the relationship of national and international groups concerned with quality assurance. Seminars apply concepts to selected products and services.

*Prerequisite(s):* 10.00 credits including (1 of ECON\*2740, STAT\*2040, STAT\*2060, STAT\*2080)

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

### **MCS\*3030 Research Methods F,W (3-0) [0.50]**

This course examines the concepts, principles and practices for consumer, market and product development research processes. Topics include research problem definition, research objectives, research design, measurement, sampling methods, execution and research management, analysis and interpretation, and report writing. (Also offered through Distance Education format.)

*Prerequisite(s):* ECON\*2740 or STAT\*2060

*Restriction(s):* Registration in B.Comm. MKMN, MKMN:C, REH, REH:C, or the BA MKMN minor. This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

### **MCS\*3040 Business and Consumer Law S,F,W (3-0) [0.50]**

This course introduces students to statutory and common law concerning business and consumer transactions. An overview of the laws of contracts and torts forms the basis of business and producer/consumer relationships. Discussion topics include sale of goods and consumer protection legislation; debtor-creditor relations; competition law; intellectual property rights and manufacturers' product liability. (Also offered through Distance Education format.)

*Prerequisite(s):* 5.00 credits

*Restriction(s):* Registration in B.Comm. program, BA BADM minor, or BA European Studies area of emphasis in European Business Studies. This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

### **MCS\*3080 The Corporation and Society F (3-0) [0.50]**

This course is designed to take students through an academic critique of global corporations in the societies and natural environment in which they operate. The course will explore current and prospective models for operating in society and the natural environment.

*Prerequisite(s):* 10.00 credits

*Restriction(s):* Registration in B.Comm. program.

### **MCS\*3500 Market Analysis and Planning F,W (3-0) [0.50]**

This course teaches students decision making theory and the methods of analysis that support decision making in the marketing discipline. Topics include customer, competitor and market analysis and methods such as forecasting and decision modeling.

*Prerequisite(s):* 10.00 credits including ECON\*1050, (MATH\*1000 or MATH\*1030), MCS\*2600, MCS\*3030, (ECON\*2740, STAT\*2060)

*Equate(s):* MCS\*3610

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

### **MCS\*3600 Consumer Information Processes F,W (3-0) [0.50]**

This course provides an in-depth treatment of information processing research and theories as they relate to consumer judgement and choice. Components of theory addressed include: attention and perception, motivation, processing capacity, encoding and memory storage, retrieval and decision processes. Applications to marketplace policy and strategy are discussed.

*Prerequisite(s):* 15.00 credits including MCS\*2600, MCS\*3030

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

### **MCS\*3620 Marketing Communications F,W (3-0) [0.50]**

This course covers concepts of communication management as practiced by organizations in all economic sectors. Communication management principles are applied to the design and evaluation of communication programs.

*Prerequisite(s):* 10.00 credits including MCS\*1000, MCS\*2600

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

### **MCS\*3820 Real Estate Development W (3-0) [0.50]**

This course introduces the student to the real estate development process, providing an overview from the project idea to the cursory feasibility stage. The steps in development planning that will be investigated are analysis, design, and evaluation. Topics include evaluating development potential, land acquisition, site planning, economic feasibility studies, approval processes, construction, project management, and marketing phases. The construction of both single family housing and larger buildings is examined. (last offering - Winter 2013)

*Prerequisite(s):* MCS\*1820 or REAL\*1820

*Restriction(s):* MCS\*4860 This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

**MCS\*4020 Research in Consumer Studies U (3-0) [0.50]**

This course provides the opportunity for an independent investigation of a pertinent topic in consumer studies. Registration requires departmental approval.

*Prerequisite(s):* 15.00 credits including MCS\*3030

*Restriction(s):* Registration in B.Comm. MKMN or B.Comm. MKMN:C.. Instructor consent required.

**MCS\*4040 Management in Product Development F (3-0) [0.50]**

The major components of this course are new product strategy formulation, the role of technical and market research, the analysis of opportunities, management of development processes, product launches, government and regulatory controls.

*Prerequisite(s):* 10.00 credits including MCS\*1000, MCS\*2600

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

**MCS\*4050 The Evolution of Capitalism: A Canadian Perspective F (3-0) [0.50]**

This course offers a Canadian perspective on capitalism as an evolving process of creative destruction; implications for Canadian culture and the allocation of economic, political, and social power; effects on education, the capacity of governments to govern, and societal notions of what constitutes the public good.

*Prerequisite(s):* 15.00 credits including ECON\*1050, ECON\*1100

*Restriction(s):* Registration in B.Comm. program.

**MCS\*4100 Entrepreneurship F (3-0) [0.50]**

This course examines the role and effect of small business in Canada, and, in doing so, helps marketing students appreciate the challenges involved in having full responsibility for a business and/or for creatively moving a business forward. The course focuses on the analysis of entrepreneurial skills and, through the development of the business plan, the steps involved in starting a new venture or increasing the size of a business.

*Prerequisite(s):* 15.00 credits including MCS\*3500 and a cumulative GPA of 70%.

*Restriction(s):* Registration in B.Comm. MKMN or B.Comm. MKMN:C.

**MCS\*4300 Marketing and Society W (3-0) [0.50]**

This course focuses on how the dissemination of marketing knowledge can influence society through the decisions made by public policy makers, corporate decision makers and non-profit marketers. It also covers how the marketing decisions made and actions taken by corporate, non-profit and public sector decision makers can affect society. As the theme of 'reciprocal influence' is developed, both direct and indirect influences of marketing knowledge and marketing decisions are pursued.

*Prerequisite(s):* 15.00 credits including MCS\*2600

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

**MCS\*4370 Marketing Strategy F,W (3-0) [0.50]**

This course focuses on the decision-making role of the marketing manager who is responsible for formulating the strategic marketing plan. The theory of selecting market target(s) for the firm's product and/or services and the development of the marketing mix (product, price, promotion, distribution) with the aid of market research and computerized information systems is covered.

*Prerequisite(s):* 15.00 credits including MCS\*3030, MCS\*3500

*Equate(s):* AGEC\*4370 , FARE\*4370

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

**MCS\*4400 Pricing Management F (3-0) [0.50]**

The objective of this course is to provide a useful conceptual framework as well as analytical techniques that can be applied in managing pricing functions. Topics to be covered include pricing strategies, tactical issues related to pricing, pricing methods, treatment of costs for pricing, consideration of competition, legal limitations and role of price in customer buying decisions for both consumer and industrial goods and services.

*Prerequisite(s):* 10.00 credits including (ECON\*3740 or MCS\*3030)

*Restriction(s):* MCS\*3100 , This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

**MCS\*4600 International Marketing F,W (3-0) [0.50]**

This course examines the study of marketing in a global context with specific emphasis on the strategic implications of marketing in different country cultures. Included are the global marketing environment and the competitive challenges and opportunities confronting today's international marketers, the cultural environment of global marketing, the assessment of global market opportunities and the development of global marketing strategies.

*Prerequisite(s):* 10.00 credits including MCS\*3030

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

**MCS\*4810 Real Estate and Housing Project W (3-0) [0.50]**

This course is a capstone course meant to bring together concepts from all other Real Estate and Housing courses. It deals with the development, redevelopment and renewal of housing and real estate services. Students will complete a project that addresses an issue in the real estate or housing sector, applying knowledge of development, market analysis, affordability, financing and government regulation. (Last offering - Winter 2014)

*Prerequisite(s):* 15.00 credits including [ MCS\*3810 or REAL\*3810), MCS\*3820, ( MCS\*4820 or REAL\*4820)]

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

**MCS\*4910 Topics in Consumer Studies U (3-0) [0.50]**

This course provides a lecture-discussion or seminar on a selected topic in consumer studies to be conducted by faculty with expertise in the area. Students should check with the department to determine what topic, if any, will be offered during a semester. Alternatively, they can ask a faculty member in MCS to supervise them as they study a topic or do a project of interest.

*Prerequisite(s):* 15.00 credits including MCS\*2600

*Restriction(s):* Registration in the B. Comm. MKMN or REH major. Instructor consent required.

**MCS\*4920 Topics in Consumer Studies U (3-0) [0.50]**

This course provides a lecture-discussion or seminar on a selected topic in consumer studies to be conducted by faculty with expertise in the area. Students should check with the department to determine what topic, if any, will be offered during a semester. Alternatively, they can ask a faculty member in MCS to supervise them as they study a topic or do a project of interest.

*Prerequisite(s):* 15.00 credits including MCS\*2600

*Restriction(s):* Registration in the B. Comm. MKMN or REH major. Instructor consent required.

**MCS\*4950 Consumer Studies Practicum W (3-0) [0.50]**

The practicum provides students with supervised experience in developing marketing plans or working on consumer studies projects.

*Prerequisite(s):* 15.00 credits including MCS\*3030, MCS\*3500, MCS\*3620 and a cumulative average of 70%

*Restriction(s):* Registration in B.Comm. MKMN or B.Comm. MKMN:C.



## Mathematics

*Department of Mathematics and Statistics*

*Suggested initial course sequence:*

1. For students with 4U or OAC Calculus and expecting to pursue further studies in mathematics or the physical sciences: MATH\*1200, MATH\*1210.
2. For students interested in applications to the biological sciences: MATH\*1080, MATH\*2080.
3. For students not expecting to pursue further studies in mathematics: MATH\*1030, one STAT\*XXXX course.

### **MATH\*1030 Business Mathematics F,W (3-1) [0.50]**

This course is intended for business and economics students. The topics covered include lines, systems of linear equations, convex sets, and basic algebra including exponential and logarithmic functions. Calculus covered in the course includes limits, continuity, sequences and series, derivatives, higher order derivatives, curve sketching, linear approximators, optimization, and integration. (Also offered through Distance Education format.)

*Prerequisite(s):* 4U Advanced Functions

*Restriction(s):* MATH\*1000 , MATH\*1080, MATH\*1200. Not available to students registered in the B.Sc. program.

### **MATH\*1050 Introduction to Mathematical Modeling U (3-1) [0.50]**

This course applies non-calculus techniques to model "real world" problems in business, psychology, sociology, political science and ecology. The mathematical topics introduced include graphs and directed graphs, linear programming, matrices, probability, games and decisions, and difference equations. Mathematics majors may not take this course for credit.

*Equate(s):* CIS\*1900

*Restriction(s):* Not available to students registered in B.Comp programs or CIS.

### **MATH\*1080 Elements of Calculus I F,W (3-1) [0.50]**

This course provides an introduction to the calculus of one variable with emphasis on mathematical modelling in the biological sciences. The topics covered include elementary functions, sequences and series, difference equations, differential calculus and integral calculus.

*Prerequisite(s):* 1 of 4U Advanced Functions, 4U Advanced Functions and Calculus or equivalent

*Restriction(s):* MATH\*1000 , MATH\*1030, MATH\*1200

### **MATH\*1200 Calculus I F (3-1) [0.50]**

This is a theoretical course intended primarily for students who expect to pursue further studies in mathematics and its applications. Topics include inequalities and absolute value; compound angle formulas for trigonometric functions; limits and continuity using rigorous definitions; the derivative and derivative formulas (including derivatives of trigonometric, exponential and logarithmic functions); Fermat's theorem; Rolle's theorem; the mean-value theorem; applications of the derivative; Riemann sums; the definite integral; the fundamental theorem of calculus; applications of the definite integral; the mean value theorem for integrals.

*Prerequisite(s):* 1 of 4U Calculus and Vectors, 4U Advanced Functions and Calculus or Grade 12 Calculus

*Restriction(s):* MATH\*1000 , MATH\*1080

### **MATH\*1210 Calculus II W (3-1) [0.50]**

This course is a continuation of MATH\*1200. It is a theoretical course intended primarily for students who need or expect to pursue further studies in mathematics, physics, chemistry, engineering and computer science. Topics include inverse functions, inverse trigonometric functions, hyperbolic functions, indeterminate forms and l'Hopital's rule, techniques of integration, parametric equations, polar coordinates, Taylor and Maclaurin series; functions of two or more variables, partial derivatives, and if time permits, an introduction to multiple integration.

*Prerequisite(s):* 1 of MATH\*1000 , MATH\*1080, MATH\*1200

*Restriction(s):* MATH\*2080

### **MATH\*2000 Set Theory F (3-1) [0.50]**

This course introduces the theory of sets and emphasizes formal mathematical proof. Topics include relations and functions, number systems including formal properties of the natural numbers, integers, and the real and complex numbers. Equivalence relations and partial and total orders are introduced. The geometry and topology of the real number line and Cartesian plane are introduced. Techniques of formal proof are introduced including well-ordering, mathematical induction, proof by contradiction, and proof by construction.

*Prerequisite(s):* 0.50 credits in mathematics at the university level

### **MATH\*2080 Elements of Calculus II F,W (3-1) [0.50]**

This course will expand on integration techniques, and introduce students to difference and differential equations, vectors, vector functions, and elements of calculus of two or more variables such as partial differentiation and multiple integration. The course will emphasize content relevant to analyzing biological systems, and methods will be illustrated by application to biological systems.

*Prerequisite(s):* 1 of MATH\*1000 , MATH\*1080, MATH\*1200

*Restriction(s):* MATH\*1210

### **MATH\*2130 Numerical Methods W (3-2) [0.50]**

This course provides a theoretical and practical introduction to numerical methods for approximating the solution(s) of linear and nonlinear problems in the applied sciences. The topics covered include: solution of a single nonlinear equation; polynomial interpolation; numerical differentiation and integration; solution of initial value and boundary value problems; and the solution of systems of linear and nonlinear algebraic equations.

*Prerequisite(s):* MATH\*1210 or MATH\*2080

### **MATH\*2150 Applied Matrix Algebra S,F,W (3-1) [0.50]**

This course provides an introduction to linear algebra in Euclidean space. Topics covered include: N-dimensional vectors, dot product, matrices and matrix operations, systems of linear equations and Gaussian elimination, linear independence, subspaces, basis and dimension, matrix inverse, matrix rank and determinant, eigenvalues, eigenvectors and diagonalization. Applications of these topics, including least squares fitting, will be included. (Also offered through Distance Education format.) MATH\*2150 is not intended for Mathematics majors.

*Prerequisite(s):* 1 of a 4U mathematics credit or a first year university mathematics credit

*Restriction(s):* MATH\*2160

### **MATH\*2160 Linear Algebra I F (3-0) [0.50]**

This course provides an introduction to linear algebra and vector spaces and emphasizes formal mathematical proof. Topics covered include: N-dimensional vectors, inner products, matrices and matrix operations, systems of linear equations and Gaussian elimination, the basic theory of vector spaces and linear transformations, matrix representations of linear transformations, change of basis matrices, eigenvalues, eigenvectors and diagonalization, inner product spaces, quadratic forms, orthogonalization and projections.

*Prerequisite(s):* MATH\*1200

*Restriction(s):* MATH\*2150

### **MATH\*2170 Differential Equations I W,S (3-1) [0.50]**

This course introduces the theory and application of differential equations, which are used to describe phenomena in a wide range of areas. First order equations are studied extensively as well as linear equations of second and higher order. Other topics include difference equations, phase plane analysis, and an introduction to power series methods and Laplace transforms.

*Prerequisite(s):* MATH\*1210 or MATH\*2080

*Restriction(s):* MATH\*2270

### **MATH\*2200 Advanced Calculus I F (3-0) [0.50]**

The topics covered in this course include infinite sequences and series, power series, tests for convergence, Taylor's theorem and Taylor series for functions of one variable, planes and quadratic surfaces, limits, and continuity, differentiability of functions of two or more variables, partial differentiation, directional derivatives and gradients, tangent planes, linear approximation, Taylor's theorem for functions of two variables, critical points, extreme value problems, implicit function theorem, Jacobians, multiple integrals, and change of variables.

*Prerequisite(s):* MATH\*1210 or MATH\*2080

### **MATH\*2210 Advanced Calculus II W (3-0) [0.50]**

This course continues the study of multiple integrals, introducing spherical and cylindrical polar coordinates. The course also covers vector and scalar fields, including the gradient, divergence, curl and directional derivative, and their physical interpretation, as well as line integrals and the theorems of Green and Stokes.

*Prerequisite(s):* MATH\*2200

### **MATH\*2270 Applied Differential Equations F (3-1) [0.50]**

This course covers the solution of differential equations which arise from problems in engineering. Topics include linear equations of first and higher order, systems of linear equations, Laplace transforms, series solutions of second-order equations, and an introduction to partial differential equations. This course is intended for students in B.Eng.

*Prerequisite(s):* ENGG\*1500, MATH\*1210

*Restriction(s):* MATH\*2170

**MATH\*3100 Differential Equations II F (3-1) [0.50]**

First order linear systems and their general solution by matrix methods. Introduction to nonlinear systems, stability, limit cycles and chaos using numerical examples. Solution in power series of second order equations including Bessel's equation. Introduction to partial differential equations and applications.

*Prerequisite(s):* (MATH\*2150 or MATH\*2160), MATH\*2170

**MATH\*3130 Abstract Algebra F (3-0) [0.50]**

This course is an introduction to abstract algebra, covering both group theory and ring theory. Specific topics covered include an introduction to group theory, permutations, symmetric and dihedral groups, subgroups, normal subgroups and factor groups. Group theory continues through the fundamental homomorphism theorem. Ring theory material covered includes an introduction to ring theory, subrings, ideals, quotient rings, polynomial rings, and the fundamental ring homomorphism theorem.

*Prerequisite(s):* MATH\*2000, (MATH\*2150 or MATH\*2160)

**MATH\*3160 Linear Algebra II W (3-0) [0.50]**

The topics in this course include complex vector spaces, direct sum decompositions of vector spaces, the Cayley-Hamilton theorem, the spectral theorem for normal operators and the Jordan canonical form.

*Prerequisite(s):* MATH\*2160

**MATH\*3170 Partial Differential Equations and Special Functions W (3-0) [0.50]**

This course covers fundamental partial differential equations: the wave equation, the heat equation and Laplace's equation. Topics include linearity and separation of variables, solution by Fourier series, Bessel and Legendre functions, an introduction to the method of characteristics and Fourier transforms.

*Prerequisite(s):* MATH\*3100

**MATH\*3200 Real Analysis F (3-0) [0.50]**

This course provides a basic foundation for real analysis. The rigorous treatment of the subject in terms of theory and examples gives students the flavour of mathematical reasoning and intuition for other advanced topics in mathematics. Topics covered include the real number line and the supremum property; metric spaces; continuity and uniform continuity; completeness and compactness; the Banach fixed-point theorem and its applications to ODEs; uniform convergence and the rigorous treatment of the Riemann integral.

*Prerequisite(s):* MATH\*2000, MATH\*2160, MATH\*2210

**MATH\*3240 Operations Research F (3-0) [0.50]**

This is a course in mathematical modelling which has applications to engineering, economics, business and logistics. Topics covered include linear programming and the simplex method, network models and the shortest path, maximum flow and minimal spanning tree problems as well as a selection of the following: non-linear programming, constrained optimization, deterministic and probabilistic dynamic programming, game theory and simulation.

*Prerequisite(s):* (MATH\*2150 or MATH\*2160), 0.50 credits in statistics

*Co-requisite(s):* MATH\*2200

**MATH\*3260 Complex Analysis W (3-0) [0.50]**

This course extends calculus to cover functions of a complex variable; it introduces complex variable techniques which are very useful for mathematics, the physical sciences and engineering. Topics include complex differentiation, planar mappings, analytic and harmonic functions, contour integration, Taylor and Laurent series, the residue calculus and its application to the computation of trigonometric and improper integrals, conformal mapping and the Dirichlet problem.

*Prerequisite(s):* MATH\*2200

**MATH\*3510 Biomathematics W (3-0) [0.50]**

This course will convey the fundamentals of applying mathematical modelling techniques to understanding and predicting the dynamics of biological systems. Students will learn the development, analysis, and interpretation of biomathematical models based on discrete-time and continuous-time models. Applications may include examples from population biology, ecology, infectious diseases, microbiology, and genetics.

*Prerequisite(s):* (MATH\*2150 or MATH\*2160), (MATH\*2170 or MATH\*2270)

**MATH\*4000 Advanced Differential Equations W (3-0) [0.50]**

This course provides a rigorous treatment of the qualitative theory of ordinary differential equations and an introduction to the modern theory of dynamical systems. Existence and uniqueness of solutions and their dependence on initial conditions and parameters are covered as well as linearization and the local behaviour of nonlinear systems near equilibrium points. Stability of solutions is examined including the stable manifold theorem and the method of Lyapunov. Limit cycles are covered, with a discussion of Poincaré-Bendixson theory in the plane. The definition and a discussion of some properties of dynamical systems, both continuous and discrete, are given, including an introduction to bifurcations and chaotic dynamics. (Offered in even-numbered years.)

*Prerequisite(s):* MATH\*3100, (MATH\*3160 or MATH\*3200)

**MATH\*4050 Topics in Mathematics I W (3-0) [0.50]**

In this course students will discuss selected topics at an advanced level. It is intended mainly for mathematics students in the 6th to 8th semester. Content will vary from year to year. Sample topics include: probability theory, Fourier analysis, mathematical logic, operator algebras, number theory combinatorics, philosophy of mathematics, fractal geometry, chaos, stochastic differential equations. (Offered in odd-numbered years.)

*Prerequisite(s):* MATH\*3200

**MATH\*4060 Topics in Mathematics II W (3-0) [0.50]**

In this course students will discuss selected topics at an advanced level as in MATH\*4050, but with different choice of topic. (Offered in even-numbered years.)

*Prerequisite(s):* MATH\*3200

**MATH\*4070 Case Studies in Modeling F (2-2) [0.50]**

The course covers selected case studies in mathematical modelling at an advanced level, and is intended for mathematical science students in the 7th or 8th semester. The course covers case studies of real-world problems arising from various areas and the contribution of mathematical models to their solution. Examples that may be covered include models of data communication networks, transportation networks, and spread of epidemics. (Offered in even-numbered years.)

*Prerequisite(s):* 3.50 credits in mathematical science including MATH\*2130 and (MATH\*2170 or MATH\*2270)

**MATH\*4140 Applied Algebra W (3-0) [0.50]**

The topics covered in this course include permutation representations and the Polya-Burnside technique of enumeration, classification of groups, the theory of fields including Galois theory, the construction of finite fields, combinatorial applications to the design of experiments, the theory of binary error correcting codes, combinatorial graphs and their symmetry groups, and finite combinatorial geometries. (Offered in even-numbered years.)

*Prerequisite(s):* MATH\*3130

**MATH\*4200 Advanced Analysis F (3-0) [0.50]**

This course covers advanced topics in analysis. It includes Lebesgue measure and integration, measure-theoretic probability, sequences and series of functions, the Stone-Weierstrass approximation theorem, compactness in function spaces and the implicit and inverse function theorems. (Offered in even-numbered years.)

*Prerequisite(s):* MATH\*3160, MATH\*3200

**MATH\*4220 Applied Functional Analysis W (3-0) [0.50]**

Hilbert and Banach spaces are covered including applications to Fourier series and numerical analysis. Other topics include the Hahn-Banach theorem; weak topologies; generalized functions and their application to differential equations; completeness; the uniform boundedness principle; Lebesgue measure and integral and applications to probability and dynamics; and spectral theory. (Offered in even-numbered years.)

*Prerequisite(s):* MATH\*3200

**MATH\*4240 Advanced Topics in Modeling W (3-0) [0.50]**

This course presents selected advanced topics in mathematical modelling, such as model formulation, techniques of model analysis and interpretation of results. Topics may include discrete and continuous models, both deterministic and probabilistic. (Offered in odd-numbered years.)

*Prerequisite(s):* MATH\*3240

**MATH\*4270 Advanced Partial Differential Equations F (3-0) [0.50]**

This course focuses on the theory of first-order and second-order partial differential equations, with examples and applications from selected fields such as physics, engineering and biology. It covers classification of linear second-order partial differential equations, the theory of associated boundary value problems, maximum principles and Green's functions. It also introduces nonlinear partial differential equations.

*Prerequisite(s):* MATH\*3170, MATH\*3200, MATH\*3260

**MATH\*4290 Geometry and Topology W (3-0) [0.50]**

This course introduces modern topics in geometry. Topics include the classical geometry of the plane and 3-space, non-Euclidean geometries, the elementary topology of graphs and surfaces and a selection from point-set topology, differential geometry, algebraic geometry, analysis on manifolds, Riemannian geometry, tensor analysis, homotopy and homology groups. (Offered in odd-numbered years.)

*Prerequisite(s):* MATH\*3130, MATH\*3200

**MATH\*4430 Advanced Numerical Methods F (3-0) [0.50]**

This course covers a wide range of numerical methods for finding solutions to mathematical problems. A large component of the course will be the implementation of algorithms on a computer using appropriate software. The mathematical problems addressed include the solution of linear systems of equations via both direct and indirect methods, finding zeros of a nonlinear function, the solution of ordinary differential equations, and the approximation of eigenvalues. Other topics may include numerical quadrature, numerical differentiation, interpolation and approximation of functions, fast Fourier transforms, finite difference and shooting methods for boundary value problems, and an introduction to partial differential equations. (Offered in odd-numbered years.)

*Prerequisite(s):* MATH\*2130, (MATH\*2150 or MATH\*2160), MATH\*2200, (MATH\*2170 or MATH\*2270)

**MATH\*4510 Environmental Transport and Dynamics F (3-0) [0.50]**

Mathematical modeling of environmental transport systems. Linear and nonlinear compartmental models. Convective and diffusive transport. Specific models selected from hydrology; ground-water and aquifer transport, dispersion of marine pollution, effluents in river systems; atmospheric pollen dispersion, plume models, dry matter suspension and deposition; Global circulation: tritium distribution. (Offered in odd-numbered years.)

*Prerequisite(s):* MATH\*3510 or MATH\*3100, 0.50 credits in statistics

**MATH\*4600 Advanced Research Project in Mathematics F,W (0-6) [1.00]**

Each student in this course will undertake an individual research project in some area of mathematics, under the supervision of a faculty member. A written report and a public presentation of the project will be required.

*Restriction(s):* Approval of a supervisor and the course coordinator.

## Molecular and Cellular Biology

### MCB\*2050 Molecular Biology of the Cell F,W (4-0) [0.50]

This course will develop an understanding of the key concepts of the molecular biology of the cell, integrating principles of cell structure and function with the underlying molecular mechanism(s). Discussions will focus on aspects of gene regulation, genomics, cell cycle control, protein synthesis, intracellular protein trafficking and protein degradation in eukaryotic cells. Many of these concepts will be discussed in the context of how defects in cellular processes give rise to disease.

*Prerequisite(s):* BIOC\*2580, MBG\*2040

*Restriction(s):* MCB\*2210

### MCB\*4010 Advanced Cell Biology W (3-0) [0.50]

This course examines the cellular and molecular biology of signal transduction. The major theme is an understanding of how eukaryotic cells receive, transmit and respond to environmental signals. Topics will include cellular regulation of cell cycle progression and cell death as well as the consequences of deregulated signal transduction in terms of disease, primarily cancer.

*Prerequisite(s):* [(BIOL\*2210 or MCB\*2210 , MBG\*2020 )] or MCB\*2050

### MCB\*4050 Protein and Nucleic Acid Structure F (3-0) [0.50]

This course explores the relationship between the functions and the three dimensional structures of DNA, RNA and proteins. Topics covered include how these structures are determined, the principles governing their folding and architecture, why some proteins don't fold at all, and the use of these structures to guide drug discovery. Practical skills are emphasized, including the use of bioinformatics and visualisation tools to analyse sequences and structures.

*Prerequisite(s):* BIOC\*3560

*Equate(s):* BIOC\*4550 , MBG\*4350

### MCB\*4060 Molecular & Cell Biology of Yeast F (3-0) [0.50]

The molecular and cellular biology of yeast as a model system in eukaryotic biology, mating, mating type switching, nutrient sensing and response, dimorphism, tissue invasion and drug resistance of selected yeasts will be discussed.

*Prerequisite(s):* [(BIOL\*2210 or MCB\*2210 , MBG\*2020 )] or MCB\*2050

*Equate(s):* BIOL\*4050

### MCB\*4500 Research Project in Molecular & Cellular Biology I S,F,W (0-12) [1.00]

This course involves independent research of a practical or theoretical nature on a specific topic in molecular and cellular biology. It is carried out under the supervision of an individual faculty member. Students should make arrangements with both a faculty advisor and the course coordinator at least one semester in advance of taking the course. The signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from, and submitted to, the course coordinator no later than the 2nd class day of the semester in which the student is registered for the course.

*Prerequisite(s):* MBG\*3350 or equivalent laboratory experience at the discretion of the student's faculty advisor. Normally, students must have completed 6 semesters in an appropriate program in the biological sciences. Minimum 70% cumulative average in science courses during the first 6 semesters of the relevant majors.

*Restriction(s):* MBG\*4500 , MICR\*4310 . Students in programs offering project courses cannot enroll in MCB\*4500. Grade requirements may be waived in exceptional circumstances at the discretion of faculty advisor and course coordinator. Course coordinator consent required.

### MCB\*4510 Research Project in Molecular & Cellular Biology 2 S,F,W (0-12) [1.00]

This course involves independent research of a practical or theoretical nature on a specific topic in molecular and cellular biology. It is carried out under the supervision of an individual faculty member. Students should make arrangements with both a faculty advisor and the course coordinator at least one semester in advance of taking the course. The signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from, and submitted to, the course coordinator no later than the 2nd class day of the semester in which the student is registered for the course.

*Prerequisite(s):* 1 of MBG\*4500 , MCB\*4500, MICR\*4310 . Normally, students must have completed 6 semesters in an appropriate program in the biological sciences. Minimum 70% cumulative average in science courses during the first 6 semesters of the relevant majors.

*Restriction(s):* MBG\*4510 , MICR\*4320 . Students in programs offering project courses cannot enroll in MCB\*4510. Grade requirements may be waived in exceptional circumstances at the discretion of faculty advisor and course coordinator. Course coordinator consent required.

### MCB\*4600 Topics in Molecular and Cellular Biology S,F,W (1-3) [0.50]

This course involves the independent study of a current topic in Molecular and Cellular Biology, selected from the recent research literature and involving a review and critical appraisal of the area. The course comprises independent library research, participation in weekly meetings, and written and oral presentations. Students should make arrangements with both faculty advisor and the course coordinator in a prior course selection period.

*Prerequisite(s):* MBG\*3350 or equivalent laboratory experience at the discretion of the student's faculty advisor. Normally, students must have a minimum of 3.00 credits in 3000 or 4000 level BIOC, MBG, MCB OR MICR courses.

*Equate(s):* MBG\*4600 , MICR\*4240

*Restriction(s):* Students in programs offering topics courses cannot enroll in MCB\*4600. Coordinator consent required.

## Meteorology

### School of Environmental Sciences

#### **MET\*1000 The Atmospheric Environment W (3-0) [0.50]**

An introduction to the atmospheric environment which covers global to local scales. Topics covered are: understanding weather maps and forecasts, weather indices for plants and people, local-scale microclimates of natural surfaces and cities, intentional modification of microclimates, diffusion of pollutants in the atmosphere and their impact on air quality and climate change, policy issues associated with air quality and climate change. (Offered through Distance Education format only.)

*Restriction(s):* Not available to students with previous MET credit. Not available to students registered in B.Sc. or B.Sc.(Env.) programs.

#### **MET\*2020 Agrometeorology W (3-0) [0.50]**

This course examines weather and climate effects on agricultural production. The relation of water balance and other climate factors to growth and yield of crops, introduction to crop-weather modeling, climate hazards and their control, weather aspects of pest and disease management are discussed.

*Prerequisite(s):* (1 of BIOL\*1020, BIOL\*1030, [2 of BIOL\*1070, BIOL\*1080, BIOL\*1090])

#### **MET\*2030 Meteorology and Climatology F (3-2) [0.50]**

This course examines solar and terrestrial radiation; pressure systems and winds; atmospheric stability and vertical motions; air masses and fronts; clouds and precipitation; selected topics in applied meteorology including air pollution. The laboratory emphasizes the analysis and use of atmospheric data for solving environmental problems.

*Prerequisite(s):* 1 of MET\*2020, PHYS\*1000, PHYS\*1070, PHYS\*1080, PHYS\*1110, PHYS\*1130

#### **MET\*3050 Microclimatology W (3-0) [0.50]**

This course examines natural and intentionally-modified microclimates near the earth's surface; energy budgets; transport of mass and heat. Familiarization with some instruments for microclimatic measurements will be required.

*Prerequisite(s):* MET\*2030 or GEOG\*2110

#### **MET\*4100 Physical Meteorology W (3-0) [0.50]**

This course introduces the principles of physical meteorology, including structure and composition of the atmosphere, radiative transfer, atmospheric energetics and cloud formation. All topics will be discussed in terms of global climate change. (Offered in odd-numbered years.)

*Prerequisite(s):* MET\*3050

#### **MET\*4210 Atmospheric Experimentation and Instrumentation W (3-0) [0.50]**

This course covers the design and implementation of field experiments for atmospheric and environmental studies. Principles of operation and practical consideration of various meteorological and soil sensors will be discussed along with overall design and implementation procedures for environmental monitoring. Students will prepare a proposal detailing an experimental design of their own.

*Prerequisite(s):* MET\*2030 or MET\*3050

*Restriction(s):* MET\*4230

## Microbiology

*School of Environmental Sciences*

*Department of Molecular and Cellular Biology*

*Department of Pathobiology*

### **MICR\*2030 Microbial Growth S,F,W (2-3) [0.50]**

This course covers the environmental factors and physiological processes of microbial growth. The transport of nutrients, the metabolic availability of energy, metabolic patterns, and versatility in diverse microorganisms. Laboratory exercises will focus on the techniques of: microscopy, isolation and enumeration, measurement of growth. Department of Molecular and Cellular Biology. (Last offering - Fall 2011)

*Prerequisite(s):* 4.00 credits including (BIOL\*1040 or BIOL\*1090)

### **MICR\*2420 Introduction to Microbiology S,F,W (3-2) [0.50]**

This course will introduce students to the diversity of microorganisms, including, bacteria, viruses, and fungi, and the impact of microbes on everyday life. The interactions of microorganisms with the biotic and abiotic worlds will be discussed. Topics will include the roles of microorganisms in host-pathogen interactions in disease, the beneficial aspects of microorganisms in bioremediation and food production, and their application in biotechnology.

*Prerequisite(s):* 4.00 credits including (1 of BIOL\*1040, BIOL\*1070, BIOL\*1080, BIOL\*1090, CHEM\*1040)

*Restriction(s):* MICR\*1020 , MICR\*2020 This is a Priority Access course. Enrolment may be restricted to particular programs, specializations or semester levels during certain periods. Please see the departmental website for more information.

### **MICR\*2430 Microbiology Methods I F,W (1-3) [0.50]**

This course uses a hands-on approach to investigate microbial growth and factors that impact growth and the interactions of microbes with biotic and abiotic environments. This course will explore the ecological diversity of microorganisms of selected environments. Students will develop a wide range of microbiology-related laboratory skills. (First offering - Winter 12)

*Prerequisite(s):* MICR\*2420

*Equate(s):* MICR\*2030

*Restriction(s):* This is a Priority Access course. Enrolment may be restricted to particular programs, specializations or semester levels during certain periods. Please see the departmental website for more information.

### **MICR\*3120 Systematic Bacteriology F (2-3) [0.50]**

Classification, nomenclature, and identification of bacteria. Methods and approaches for the isolation and identification of bacteria are considered in the laboratory. The characteristics of some groups of common bacteria and the contributions of molecular systematics to bacterial classification are discussed. Department of Molecular and Cellular Biology. (Last offering - Fall 2011)

*Prerequisite(s):* MICR\*2030

### **MICR\*3220 Plant Microbiology F (3-0) [0.50]**

In this course the interaction between plants and microorganisms will be studied. Topics include molecular plant-microbe interactions, plant defenses, bacterial ice nucleation, interaction among plant microbes, root nodulation, mycorrhizae, wood decay, and decomposition of plant litter. School of Environmental Sciences

*Prerequisite(s):* BIOL\*1040 or (BIOL\*1070, BIOL\*1090)

### **MICR\*3230 Immunology F (3-0) [0.50]**

This course provides an introduction to the immune response of the vertebrate host, the cells and tissues of the lymphoid system, humoral and cell-mediated immunity, the concept of immunity to diseases and current techniques in immunology. Department of Molecular and Cellular Biology and Department of Pathobiology.

*Prerequisite(s):* (BIOL\*1040 or BIOL\*1090), BIOC\*2580

### **MICR\*3260 Microbial Adaptation and Development W (3-1) [0.50]**

Adaptation, development, and modulation of microbial physiology in response to environmental stimuli (tutorials included). Department of Molecular and Cellular Biology.

*Prerequisite(s):* BIOC\*3560, ( MBG\*3070 or MBG\*3080)

### **MICR\*3270 Microbial Cell Biology W (3-0) [0.50]**

This course describes the diversity in form and function in microorganisms. The structures of critical cellular components will be considered from the perspective of the cellular requirements for survival in different environments. The underlying macromolecular assembly systems will be considered in the context of their integration into cell division and the bacterial cell cycle, as well as their exploitation as targets for antibiotics and other therapeutic approaches. Department of Molecular and Cellular Biology. (Last offering - Winter 2012)

*Prerequisite(s):* ( BIOL\*2210 or MCB\*2210 ), ( MBG\*2020 or MBG\*2040), MICR\*2030

*Co-requisite(s):* BIOC\*3560

*Restriction(s):* MICR\*4270

### **MICR\*3330 World of Viruses F (3-0) [0.50]**

Viruses infecting many organisms will be covered in the context of their global impact on disease and history, beneficial uses of viruses, and their role in advances of molecular theory. A fundamental virology background will be achieved by understanding the diversity of viruses, their replication strategies and their interactions with the host in disease. The relevance of viruses in society will be highlighted by discussion of historical accounts and contemporary news articles. Department of Molecular and Cellular

*Prerequisite(s):* ( MCB\*2210 , MBG\*2020 ) or MCB\*2050

### **MICR\*3420 Microbial Diversity F (3-0) [0.50]**

The cycling of elements (carbon, nitrogen, sulphur) within ecosystems involves the contributions of diverse microorganisms. This course will study the diversity of Bacteria and Archaea in selected ecosystems at an organismal level, investigate the metabolic and enzymatic diversity in microbes that contribute to and thrive within these environments, and examine the methodologies used to study the relationships and evolution of microorganisms within an ecosystem. (First offering - Fall 2012)

*Prerequisite(s):* BIOC\*3560, ( MBG\*2020 or MBG\*2040), MICR\*2430

*Equate(s):* MICR\*3120

### **MICR\*3430 Microbiology Methods II W (1-3) [0.50]**

This course will use a hands-on approach to investigate concepts and develop skills needed for the isolation, identification and classification of microorganisms. Classical, molecular, and bioinformatic techniques will be used to isolate and identify bacteria and viruses from natural environments. (First offering - Winter 2013)

*Prerequisite(s):* MBG\*3080, MICR\*2430

*Co-requisite(s):* MBG\*3350

*Equate(s):* MICR\*3120

### **MICR\*4010 Pathogenic Bacteriology W (3-0) [0.50]**

This course focuses on the interactions between bacterial pathogens and host animals, including immune and inflammatory responses of the host's defense mechanisms. The structural and physiological characteristics of a number of important bacteria causing human and animal diseases are considered. Department of Molecular and Cellular Biology.

*Prerequisite(s):* [( MBG\*2020 , MCB\*2210 ) or MCB\*2050], ( MICR\*2020 , MICR\*2420), (MICR\*3230 recommended)

### **MICR\*4140 Soil Microbiology and Biotechnology F (3-0) [0.50]**

In this course soil microorganisms will be studied with an emphasis on their diverse metabolic activities and biotechnological uses of soil microorganisms. Current topics will include soil as an environment for microorganisms, cell division in soil, starvation survival mechanisms, microbial evolution, soil microbial biodiversity, gene transfer, microbial gene expression in soil, extraction and purification of microbial nucleic acids, metabolism of soil pollutants and metal-microbe interactions. The use of molecular-based and fluorescent methods to study microorganisms in soil will also be presented. School of Environmental Sciences.

*Prerequisite(s):* BIOC\*2580, [BIOL\*1040 or (2 of BIOL\*1070, BIOL\*1080, BIOL\*1090)]

### **MICR\*4180 Microbial Processes in Environmental Management F (3-0) [0.50]**

In this course the metabolic basis of microbial processes fundamentally important in the management of agricultural, industrial or municipal wastes are examined. Topics covered include relevant considerations in using microorganisms for pollution control, factors that affect efficient microbial degradation in the environment, and major microbial enzyme systems/pathways for biodegradation of persistent pollutants. Emphasis will be placed on the biochemistry, physiology, genetics and biotechnological applications of pollutant-degrading microorganisms. School of Environmental Sciences.

*Prerequisite(s):* BIOC\*2580, [BIOL\*1040 or (2 of BIOL\*1070, BIOL\*1080, BIOL\*1090)]

**MICR\*4280 Microbial Ecology W (3-0) [0.50]**

This course is a study of natural microbial communities: their structure, function and the factors that impact them. The topics include standard and new techniques that are being developed for analyzing microbial communities, current research on microbial ecology of the ocean, the terrestrial and the human ecosystems, Gaia theory, astrobiology and the role of microbes in the evolution of life on Earth. This course covers the metagenomic approach and how it impacts the current view of the diversity of uncultured microbes in the biosphere, and the biochemical basis for extremophile survival and the application of this knowledge on protein structure-function relationships and biotechnology. Department of Molecular and Cellular Biology.

*Prerequisite(s):* ( MBG\*2020 or MBG\*2040), (MICR\*2030 or MICR\*2430), MBG\*3350, (MICR\*3120 or MICR\*3420)

**MICR\*4330 Molecular Virology W (2-3) [0.50]**

This course will focus on molecular aspects of virus replication cycles and the diverse strategies used for replication of select RNA and DNA viruses. Virus-host interactions including tumour virology and host antiviral responses such as interferon and apoptosis will be discussed. Viral anti host-defence responses as well as recent advances in molecular virology and evolution will be also be covered. Department of Molecular and Cellular Biology.

*Prerequisite(s):* MICR\*3330, (MICR\*2030 or MICR\*2430 is recommended)

**MICR\*4430 Medical Virology W (3-0) [0.50]**

A study of the interactions of animal viruses and their hosts and of important diseases of humans caused by viruses in different taxonomic groups. The emphasis is on aspects of pathogenesis, epidemiology, immune responses and control. Recent advances in the application of molecular biology to the development of diagnostic tests and vaccines will be included. Department of Pathobiology.

*Prerequisite(s):* MICR\*3330

**MICR\*4520 Microbial Cell Biology F (3-0) [0.50]**

This course explores the structure-function relationships of macromolecular complexes and cellular ultrastructures involved in fundamental microbial processes. The structures of macromolecular machines will be considered from the perspective of the cellular requirements for survival in different environments, and will be discussed in the context of their integration into cell division and the bacterial cell cycle, as well as their exploitation as targets for antibiotics and other therapeutic approaches. (First offering - Fall 2012)

*Prerequisite(s):* BIOC\*3560, MBG\*3080

*Restriction(s):* MICR\*3270

**MICR\*4530 Immunology II W (3-0) [0.50]**

This course will focus on advanced aspects of the structure and function of the vertebrate immune system in health and disease. Various topics including inflammation, hypersensitivity reactions, immune-mediated diseases such as allergy and autoimmunity, immune response to infection, vaccine development, experimental systems, immunoinformatics and antibody engineering will be discussed.

*Prerequisite(s):* MICR\*3230

*Restriction(s):* MICR\*4230

## Molecular Biology and Genetics

*Department of Animal and Poultry Science*

*Department of Molecular and Cellular Biology*

*Department of Plant Agriculture*

*Department of Integrative Biology*

### **MBG\*1000 Genetics and Society W (3-1) [0.50]**

This course covers the basic principles of genetics at work in human society. The roles of genes and inheritance in the biology of humans and the organisms with which we interact. Introduction to some of the social and ethical consequences of genetic knowledge and practice. This is a science course designed primarily for students in the Arts or Social and Applied Human Sciences. Department of Molecular and Cellular Biology.

*Restriction(s):* Not available to students registered in B.Sc. programs.

### **MBG\*2040 Foundations in Molecular Biology and Genetics F,W (4-0) [0.50]**

This course will develop an understanding of the fundamental concepts in genetics, including patterns of inheritance, allelic variation, gene interaction, linkage, gene mapping and changes in chromosome structure and number. This will be followed by in-depth discussions on gene structure, replication, transcription, translation, recombination, mutation and DNA repair, and an introduction to gene regulation.

*Prerequisite(s):* 4.00 credits including (BIOL\*1040 or BIOL\*1090)

*Restriction(s):* MBG\*2000 , MBG\*2020

### **MBG\*3050 Human Genetics W (3-3) [0.50]**

This course is designed to introduce the student to the study of biological inheritance in humans. The course includes discussion of the genetic basis of human individual differences, gene frequencies in human populations, human behavioral genetics, human cytogenetics, biochemical genetics and developmental genetics, medical genetics and other aspects of human heredity. Department of Molecular and Cellular Biology.

*Prerequisite(s):* MBG\*2020 or MCB\*2050

### **MBG\*3060 Quantitative Genetics W (3-2) [0.50]**

This course examines the nature of Mendelian inheritance when extended to quantitative traits that are jointly influenced by the environment and the simultaneous segregation of many genes. Prediction of response to natural and artificial selection in populations will also be studied. Department of Animal and Poultry Science. (Also offered through Distance Education format.)

*Prerequisite(s):* ( MBG\*2000 or MBG\*2040), 0.50 credits in statistics

### **MBG\*3080 Bacterial Genetics F (3-0) [0.50]**

This course focuses on the genetics of prokaryotic microorganisms and their viruses. Some major topics covered are: regulation of gene expression, analysis of bacterial and phage genomes, plasmids, transposable elements, and mutation studies. Department of Molecular and Cellular Biology.

*Prerequisite(s):* ( MBG\*2020 or MBG\*2040), (1 of MICR\*2020 , MICR\*2030, MICR\*2420)

### **MBG\*3090 Applied Animal Genetics F (3-2) [0.50]**

This course studies the basis of, and methods for, effective use of modern animal breeding tools for practical improvement of livestock species. The course involves an examination and comparison of the structure of genetic improvement programs across species. International aspects and challenges to animal breeding programs are considered. Department of Animal and Poultry Science. (Also offered through Distance Education format.)

*Prerequisite(s):* ( MBG\*2000 or MBG\*2040), 0.50 credits in statistics

### **MBG\*3100 Plant Genetics F (3-2) [0.50]**

This course examines reproduction in plants, genome organization, organelle and polyploid genetics, and analyses of mutations, genetic variation and linkage with classical and modern approaches. Department of Plant Agriculture.

*Prerequisite(s):* ( MBG\*2000 or MBG\*2040), STAT\*2040

### **MBG\*3350 Laboratory Methods in Molecular Biology I F,W (1-8) [0.75]**

This course involves laboratory based instruction in the basic methodologies of Molecular Biology. Students will have the opportunity to develop technical skills and practical knowledge sufficient to perform basic procedures independently, and to diagnose and analyze experimental results obtained with these techniques. Department of Molecular and Cellular Biology.

*Prerequisite(s):* BIOC\*2580, ( MBG\*2020 or MCB\*2050)

*Restriction(s):* Registration in the B.Sc. major in BIOC, BIOC:C, BTOX, BTOX:C, MICR, MICR:C, MBG, PBTC, PLSC, TOX, TOX:C

### **MBG\*3360 Laboratory Methods in Molecular Biology II W (0-8) [0.75]**

This is a laboratory based course which builds on the techniques introduced in MBG\*3350. Students will have the opportunity to develop technical skills and practical knowledge sufficient to perform advanced agendas independently, and to diagnose and analyze experimental results obtained with these techniques. Department of Molecular and Cellular Biology.

*Prerequisite(s):* 70% in ( MBG\*2020 or MCB\*2050) and 75% in MBG\*3350

### **MBG\*3660 Genomics F (3-0) [0.50]**

This course examines the genomes of eukaryotes and prokaryotes. Topics covered include how genomes are mapped and sequenced, the function of the genome and ethical issues arising from genomic information. How genomic data is used for understanding and treating human disease and for the study of evolution will also be discussed.

*Prerequisite(s):* MBG\*2020 or MCB\*2050

*Restriction(s):* MBG\*3600

### **MBG\*4030 Animal Breeding Methods F (3-2) [0.50]**

Theoretical and scientific aspects of practical animal breeding programs which lead to genetic improvement of efficiency and profitability of animal production. Integrates quantitative genetics with concepts of statistics, economics, biology and biotechnology and expands into development of practical breeding plans. Department of Animal and Poultry Science.

*Prerequisite(s):* MBG\*3060

### **MBG\*4040 Genetics and Molecular Biology of Development F (3-2) [0.50]**

This course provides an examination of the genetic mechanisms that underlie organismal development. The molecular biology of cell determination and differentiation and the genetic control of morphogenesis and pattern formation will be emphasized. Department of Molecular and Cellular Biology.

*Prerequisite(s):* MBG\*2020 or MCB\*2050

*Restriction(s):* MBG\*4070

### **MBG\*4070 Genetics and Molecular Biology of Development F (3-0) [0.50]**

This course is the lecture portion only of MBG\*4040

*Prerequisite(s):* MBG\*2020 or MCB\*2050

*Restriction(s):* MBG\*4040

### **MBG\*4080 Molecular Genetics F (3-0) [0.50]**

In this course the topics studied will include the chemical nature of genetic material, transcription and the control of gene expression, and DNA cloning and the use of recombinant DNA molecules in modifying gene expression. Department of Molecular and Cellular Biology.

*Prerequisite(s):* MBG\*2020 or MCB\*2050

### **MBG\*4110 Advanced Concepts in Genetics F (3-0) [0.50]**

This course presents classical non-Mendelian phenomena, including analysis of chromosome breakage, transposition, imprinting and paramutation. Modern advances in gene regulation via epigenetic phenomena will be a central theme, focusing on chromatin remodeling, gene silencing and RNA interference as they pertain to organism development, with an emphasis on plants. Department of Molecular and Cellular Biology.

*Prerequisite(s):* MBG\*2020 or MCB\*2050

### **MBG\*4160 Plant Breeding W (3-2) [0.50]**

This course examines the application of genetic principles to plant improvement. Topics include breeding objectives, mating systems, selection, testing and germplasm maintenance of horticultural and crop plants. Department of Plant Agriculture.

*Prerequisite(s):* ( MBG\*2000 or MBG\*2040), STAT\*2040

### **MBG\*4240 Applied Molecular Genetics W (3-0) [0.50]**

In this course the topics studied will include molecular and cellular aspects of biotechnology, in vitro manipulations of animal and plant cells, genetic engineering in eukaryotes and development of transgenic organisms, methods of gene therapy and molecular biology of cancer and its treatment. Department of Molecular and Cellular Biology.

*Prerequisite(s):* MBG\*2020 or MCB\*2050

### **MBG\*4270 DNA Replication, Recombination and Repair W (3-0) [0.50]**

This course will examine the DNA transactions that determine the structure and function of the genome, with an emphasis on natural and synthetic mutagens and their mode of action, replication and recombination of genetic material, recognition and repair of DNA damage, and inherited and somatic genetic diseases arising from abnormal DNA metabolism. Department of Molecular and Cellular Biology.

*Prerequisite(s):* MBG\*2020 or MCB\*2050



**MBG\*4300 Plant Molecular Genetics W (3-0) [0.50]**

This course studies the molecular genetics of plants. The topics include: plant genome diversity and synteny; *Arabidopsis thaliana* genome, hormonal, environmental and developmental regulation of gene expression; chloroplast and mitochondrial genomes; and gene expression and silencing in transgenics. The course will be delivered using a lecture and paper discussion format. Students will learn and use a variety of computer techniques to search and analyze plant genome databases. Department of Plant Agriculture.

*Prerequisite(s):* MBG\*2000 or MBG\*2040

## Music

*School of Fine Art and Music*

*Ensembles*

*Chamber Ensembles*

*Choir (Symphonic Choir, Chamber Choir, Siren-Women's Choir)*

*Concert Winds*

*Contemporary Music Ensemble*

*Early Music Ensemble*

*Jazz Band*

**Note:** All ensembles are not necessarily offered every semester.

**Solo Performance (Applied Music):** *Private instruction is offered in piano, voice, orchestral instruments, and various jazz and early instruments. In order to register in Applied Music (MUSC\*1500), students must arrange an audition with the School of Fine Art and Music at the time of course selection. Applied Music is restricted to students registered in a Music program (general, area of concentration; honours, major or minor), in Semesters 1-4 (with the exception of Honours Majors in Music, who may audition to register in MUSC\*1500 at any time in their studies).*

*Applied Music courses are designed to be taken in successive semesters. Registration in this sequence following an interruption of more than one semester requires permission of the Director of the School. Students may be required to re-apply before registering to continue in Applied Music. Students must achieve a minimum grade of 70% in Applied Music courses in order to proceed to the next level.*

**Applied Composition:** *Private instruction is offered in music composition. In order to register in Applied Composition (MUSC\*2410), students must submit a portfolio of compositions (scores and recordings) with the School of Fine Art and Music at the time of course selection. Interviews are held prior to the first day of classes each semester (see School of Fine Art and Music for interview schedule.) In order to enroll in Applied Composition, students must be registered in a Music program (Honours major or minor, or General, Area of Concentration).*

*Applied Composition courses are designed to be taken during successive Fall and Winter terms. If this sequence is interrupted for more than one semester, students may be required to reapply (an interview and submission of a portfolio) before registering to continue in Applied Composition. Students must achieve a minimum grade of 70% in Applied Composition courses in order to proceed to the next level.*

### **MUSC\*1060 "Classical" Music: Context and Codes F,W (3-0) [0.50]**

An introductory course intended for students with NO previous experience in music. The main concepts and terminology of music from the Medieval period through the 20th-century will be explored in connection with the study of selected musical works. (Also offered through Distance Education format.)

**Restriction(s):** MUSC\*2280, MUSC\*2600, MUSC\*2610, MUSC\*2620, MUSC\*3630

### **MUSC\*1090 Physics of Music F (3-0) [0.50]**

This course is designed for arts and social science students with an interest or background in music. The fundamentals of vibrations and waves will be introduced and applied to a study of archetypal instruments. The psychoacoustic basis of pitch and loudness will be discussed. (Also listed as PHYS\*1810.) (Offered in even-numbered years.)

**Restriction(s):** PHYS\*1810; students who have standing in any other 1000 level Physics course (except PHYS\*1020 or PHYS\*1600) may enrol in this only if they are completing an honours or general program in Music, in which case permission of the instructor is required.

### **MUSC\*1130 Introduction to Musicianship S,F,W (0-8) [0.50]**

Fundamentals of ear training, sight-singing, keyboard, and written skills (rudiments such as scales, intervals and basic chord identification) are introduced. Proficiency on an instrument is not required, but previous experience with note-reading is expected. MUSC\*1130 cannot be counted toward a specialization in music. (Offered through Distance Education format only.)

**Equate(s):** MUSC\*1120

**Restriction(s):** MUSC\*1180

### **MUSC\*1180 Musicianship I F,W (3-0) [0.50]**

Ear training through dictation and sight-singing exercises; C clefs; elementary improvisation and harmonization.

### **MUSC\*1500 Applied Music I F,W (1-6) [0.50]**

This course provides individual instruction in the technical and stylistic aspects of artistic solo instrumental or vocal performance. In order to register for this course, students must arrange an audition with the School of Fine Art and Music at the time of course selection.

**Restriction(s):** Successful completion of an audition. Registration in semesters 1 to 4 (with the exception of BA Honours Music Majors, who may apply at any time). Registration in a Music Specialization.

### **MUSC\*1510 Applied Music II S,F,W (1-6) [0.50]**

This course is a continuation of MUSC\*1500.

**Prerequisite(s):** A minimum grade of 70% in MUSC\*1500.

**Restriction(s):** Registration in a Music Specialization.

### **MUSC\*2010 The Musical Avant-Garde F (3-0) [0.50]**

This course offers an introduction to the avant-garde musical life of the 20th century including the works of Debussy, Stravinsky, Satie, Schoenberg, Cage, Cowell, and others. (Offered in even-numbered years.)

### **MUSC\*2030 Music in Canada F (3-0) [0.50]**

The background and development of musical life in Canada. Cultivation of understanding of Canadian music using recorded examples with emphasis on 20th-century compositions. (Offered in odd-numbered years.)

### **MUSC\*2100 Creating Music on the Computer F,W (3-0) [0.50]**

An introduction to computer technologies as they apply to the creation and manipulation of music. Topics will be drawn from the areas of sound synthesis and processing, recording, encoding, and transcription. The course will include a classroom and an applied component.

**Prerequisite(s):** MUSC\*1180 or MUSC\*2180. Some computer experience is recommended.

### **MUSC\*2140 History of Jazz F,W (3-0) [0.50]**

A survey of the major styles, personalities, and performances of the jazz tradition in terms of its social and cultural contexts through the examination of jazz texts and commentary, autobiographies of musicians, and recorded examples of important performances. (Also offered through Distance Education format.)

### **MUSC\*2150 Music and Popular Culture F,W (3-0) [0.50]**

A survey of the major genres, styles, personalities and performance of popular music primarily in the 20th-century through lectures, listening, discussion and reading. Issues such as the relationships between popular music and race, class, technology, and art will be examined. Technical knowledge of music is not required. (Also offered through Distance Education format.)

### **MUSC\*2180 Musicianship II F,W (3-0) [0.50]**

A continuation of MUSC\*1180.

**Prerequisite(s):** MUSC\*1180

### **MUSC\*2220 Electronica: Music in the Digital Age W (3-0) [0.50]**

This course will provide an introduction to digital music, from the initial "cybernetic" experiments of the 1950s to the evolution of software tools for synthesizing, processing, and analyzing sound to the development of music/audio-related hardware such as digital synthesizers, samplers, recorders, mixers, and workstations. An overview of musical genres utilizing digital technology will be presented (experimental, techno, dance, rap, ambient, etc.). Digital technology, including the revolutionary MIDI protocol, will be set into historical context, looking at musical and social developments and milestones, as well as related non-digital technology such as analog synthesizers and multi-track recorders. (Offered in even-numbered years.)

### **MUSC\*2270 World Music W (3-0) [0.50]**

This course offers an ethnomusicological introduction to the musical life of Sub-Saharan Africa, India, South America, the Middle East, Indonesia, and the Far East.

**Restriction(s):** MUSC\*2200, MUSC\*2110

### **MUSC\*2280 Masterworks of Music W (0-10) [0.50]**

Selected musical works from 1600 to the present will be studied with reference to the historical, literary, and artistic milieu in which they were written and performed. Previous familiarity with basic musical terminology and note reading is required. (Offered through Distance Education format only.)

### **MUSC\*2330 Genre and Style in Western Art Music F (3-0) [0.50]**

Through a close study of representative works from the Western Art Music tradition, this course examines the structure and context of enduring musical genres and styles from the 16th through the 19th centuries. An emphasis is placed on critical listening, score reading, and historical research in music.

**Prerequisite(s):** MUSC\*1060, MUSC\*1180

**Restriction(s):** MUSC\*2600, MUSC\*2610, MUSC\*2620

### **MUSC\*2410 Applied Composition I F,W (1-6) [0.50]**

This course offers individual instruction in the technical and aesthetic aspects of music composition. In order to register for this course, students must submit a portfolio and arrange for an interview with the School of Fine Arts and Music at the time of course selection.

**Prerequisite(s):** MUSC\*2180

**Restriction(s):** Instructor consent and registration in a Music Program (Honours major or minor, General).

<b>MUSC*2420 Applied Composition II F,W (1-6) [0.50]</b>
This course is a continuation of MUSC*2410. <i>Prerequisite(s):</i> A minimum grade of 70% in MUSC*2410. <i>Restriction(s):</i> Registration in a Music Program (Honours major or minor, General).
<b>MUSC*2500 Applied Music III S,F,W (1-6) [0.50]</b>
A continuation of MUSC*1510. <i>Prerequisite(s):</i> (MUSC*1180 or MUSC*2180), a minimum grade of 70% in MUSC*1510. (MUSC*1180 or MUSC*2180 may be taken as corequisite) <i>Restriction(s):</i> Registration in a Music specialization.
<b>MUSC*2510 Applied Music IV S,F,W (1-6) [0.50]</b>
A continuation of MUSC*2500. <i>Prerequisite(s):</i> A minimum grade of 70% in MUSC*2500 <i>Restriction(s):</i> Registration in a Music specialization.
<b>MUSC*2530 Instrumental Ensembles I F,W (0-2) [0.25]</b>
The study and performance of selected instrumental music through participation in one of the School's ensembles: Chamber Ensemble, Concert Winds, Contemporary Music Ensemble, Jazz Band, or the Early Music Ensemble. In order to register for an ensemble, the student must arrange for an audition with the School of Fine Art and Music. Auditions will be held prior to the first day of classes each Fall and Winter semester. Students must check with the School of Fine Art and Music office for audition dates. Students are encouraged to audition for an ensemble in the Fall semester and to participate in it for both Fall and Winter semesters. Not all ensembles will be able to accept new members in Winter. Consult the School of Fine Art and Music for further information. <i>Restriction(s):</i> Successful completion of an audition. Instructor consent required.
<b>MUSC*2540 Instrumental Ensembles II F,W (0-2) [0.25]</b>
A continuation of MUSC*2530. <i>Prerequisite(s):</i> MUSC*2530 <i>Restriction(s):</i> Instructor consent required.
<b>MUSC*2550 Choral Ensembles I F,W (0-2) [0.25]</b>
The study and performance of selected choral literature through participation in one of the School's ensembles; the University of Guelph Symphonic Choir, the Chamber Choir, or Siren. In order to register for an ensemble, the student must arrange for an audition with the School of Fine Art and Music. Auditions will be held prior to the first day of classes each Fall and Winter semester. Students must check with the School of Fine Art and Music office for audition dates. Students are encouraged to audition for an ensemble in the Fall semester and to participate in it for both Fall and Winter semesters. Not all ensembles will be able to accept new members in Winter. Consult the School of Fine Art and Music for further information. <i>Equate(s):</i> MUSC*2520 <i>Restriction(s):</i> Successful completion of an audition. Instructor consent required.
<b>MUSC*2560 Choral Ensembles II F,W (0-2) [0.25]</b>
A continuation of MUSC*2550. <i>Prerequisite(s):</i> MUSC*2550 <i>Equate(s):</i> MUSC*2520 <i>Restriction(s):</i> Instructor consent required.
<b>MUSC*2570 Keyboard Accompaniment I F,W (0-2) [0.25]</b>
Development of sight-reading and accompaniment skills for pianists in close coordination with vocal and instrumental applied music students. <i>Prerequisite(s):</i> MUSC*2510 on piano. <i>Restriction(s):</i> Instructor consent required.
<b>MUSC*2580 Keyboard Accompaniment II F,W (0-2) [0.25]</b>
A continuation of MUSC*2570. <i>Prerequisite(s):</i> MUSC*2570
<b>MUSC*2660 Materials of Music I F (3-0) [0.50]</b>
This course is a study of music theory and analysis. It builds on rudiments and musicianship skills developed in MUSC*1180 and introduces students to materials of music including melodic construction, phrase structure, linear counterpoint, rhythmic organization, and diatonic harmony. Students will work on both applied and analytical assignments. <i>Prerequisite(s):</i> MUSC*1180 <i>Restriction(s):</i> MUSC*1250 , MUSC*2360

<b>MUSC*2670 Materials of Music II W (3-0) [0.50]</b>
This course continues the study of music theory and analysis. Students move on to learn about and work with more advanced concepts of tonal harmony and music analysis. The second half of the course introduces students to post-tonal music (20th-century). Students will work on both applied and analytical assignments. <i>Prerequisite(s):</i> MUSC*2180, MUSC*2660 <i>Restriction(s):</i> MUSC*2360 , MUSC*2370
<b>MUSC*3150 Music in London F (3-0) [0.50]</b>
A lecture/seminar course that will examine in depth choral and instrumental music of major composers from representative periods and media, performed at London, England. Compositions will be analyzed in relation to their stylistic technique, formal structure, and historical place in the repertoire of music. A professor of music will present weekly seminars, arrange assignments, and give personal supervision in London. <i>Restriction(s):</i> Admission to the London Semester.
<b>MUSC*3410 Applied Composition III F,W (1-6) [0.50]</b>
This course is a continuation of MUSC*2420. <i>Prerequisite(s):</i> A minimum grade of 70% in MUSC*2420 and (2 of MUSC*2530, MUSC*2540, MUSC*2550, MUSC*2560). <i>Restriction(s):</i> Registration in a Music Program (Honours major or minor, General).
<b>MUSC*3420 Applied Composition IV F,W (1-6) [0.50]</b>
This course is a continuation of MUSC*3410. <i>Prerequisite(s):</i> A minimum grade of 70% in MUSC*3410. <i>Restriction(s):</i> Registration in a Music Program (Honours major or minor, General).
<b>MUSC*3500 Applied Music V S,F,W (1-6) [0.50]</b>
A continuation of MUSC*2510. <i>Prerequisite(s):</i> 3.00 credits in music courses including a minimum grade of 70% in MUSC*2510, (MUSC*2540 or MUSC*2560). <i>Restriction(s):</i> Registration in a Music Program (Honours major or minor, General, Area of Concentration).
<b>MUSC*3510 Applied Music VI S,F,W (1-6) [0.50]</b>
A continuation of MUSC*3500 including preparation and performance of a juried recital; restricted to students in a Music program (honours major or minor or general, area of concentration). <i>Prerequisite(s):</i> 4.00 credits in music courses including a minimum grade of 70% in MUSC*3500 <i>Restriction(s):</i> Registration in a Music Program (Honours major or minor, General, Area of Concentration).
<b>MUSC*3550 Advanced Music Ensemble I F,W (0-3) [0.25]</b>
The study and performance of selected instrumental or vocal chamber music through participation in a small ensemble under the guidance of a supervising instructor. Students will organize the ensemble, which normally consists of two to six vocalists and/or instrumentalists, design a project with the instructor, and submit the proposal to the Director of the School of Fine Art and Music for approval by the last day of course selection in Fall (for Winter) or Winter (for the following Fall). A form is available from the School office for this purpose. <i>Prerequisite(s):</i> MUSC*2500, (2 of MUSC*2530, MUSC*2540, MUSC*2550, MUSC*2560) <i>Restriction(s):</i> Registration in a Music Program (Honours major or minor, General, Area of Concentration). Instructor consent required.
<b>MUSC*3560 Advanced Music Ensemble II F,W (0-3) [0.25]</b>
A continuation of MUSC*3550. <i>Prerequisite(s):</i> MUSC*3550 <i>Restriction(s):</i> Instructor consent required.
<b>MUSC*3630 20th Century Music W (3-0) [0.50]</b>
This course examines music from the late 19th century (Debussy and post-romantic composers) to the present from both historical and theoretical perspectives. <i>Prerequisite(s):</i> ( MUSC*2370 or MUSC*2670), (MUSC*2330 or MUSC*2620 )
<b>The following topics courses normally focus on current areas of faculty research. It is expected that students will have completed at least 10.00 credits before taking these upper-level courses.</b>
<b>MUSC*3730 Topics in Jazz and Improvised Music F (3-0) [1.00]</b>
This course provides a seminar experience in focussed topics related to jazz and improvised music. Topics will normally include some combination of the following: jazz/improvisation history and theory, critical studies in jazz/ improvised music. Subject matter will vary according to the instructor. (Offered in even-numbered years.) <i>Prerequisite(s):</i> 9.00 credits including MUSC*2010 or MUSC*2140

**MUSC\*3740 Topics in Popular Music Studies F (3-0) [1.00]**

This course examines the rise and impact of the cultural industries on production and consumption of music, the development of transnational popular music, and the role popular music plays in the politics of social identity. (Offered in even-numbered years.)

*Prerequisite(s):* 9.00 credits including (MUSC\*1180 or MUSC\*2180), MUSC\*2150

**MUSC\*3800 Topics in Music History/Analysis W (3-0) [1.00]**

This course examines selected topics in music history, performance practice, analysis, and music within its cultural context. (Offered in even-number years.)

*Prerequisite(s):* 9.00 credits including MUSC\*2670, MUSC\*3630

**MUSC\*3820 Topics in Ethnomusicology F (3-0) [1.00]**

Topics for this course will normally include some combination of the following: a specific world music tradition, ethnomusicological issues, theories, or methods. Subject matter will vary according to the instructor. (Offered in odd-number years.)

*Prerequisite(s):* 9.00 credits including (MUSC\*1180 or MUSC\*2180), MUSC\*2270

**MUSC\*3860 Topics in Digital Music F (3-0) [1.00]**

This is a course which focuses on a specific area of digital music production. Topics may include advanced audio production, advanced MIDI sequencing, advanced music notation/instrumentation, synthesis and signal processing, music-oriented computer programming, or interactive computer music. Normally, a major creative project will be completed and presented as an outcome of the course. (Offered in odd-number years.)

*Prerequisite(s):* 9.00 credits including MUSC\*2100, (MUSC\*2010 or MUSC\*2220)

*Restriction(s):* Instructor consent required.

**MUSC\*3880 Topics in Music Pedagogy W (3-0) [1.00]**

This course examines current philosophical trends in music education, and the application of various theories of music learning. Students will be asked to process conflicting ideas as presented through readings, class discussion, and their own experience as learners. There is also a practical component, in which each student will conduct an ensemble or give a series of private lessons, as well as present a collaborative teaching assignment. The course is designed to prepare music students to teach privately or in a classroom. (Offered in odd-numbered years.)

*Prerequisite(s):* 9.00 credits including MUSC\*2180, MUSC\*2670

**MUSC\*4200 Independent Project in Music S,F,W (3-0) [0.50]**

This is an independent learning option in music for qualified students working in consultation with a faculty advisor. The project may take the form of a course of readings and assignments, enabling the student to investigate a topic in music not otherwise available in the curriculum. It may also include a creative component (such as composition) or an experiential learning component (such as a professional performance opportunity, or a community outreach opportunity). A written proposal, signed by the faculty advisor, must be submitted to the Director of the School for approval by the last day of course selection in the previous semester.

*Prerequisite(s):* 3.00 credits in Music

*Restriction(s):* Instructor consent required, registration in an honours major or minor in music or an area of concentration (General Program) in music.

**MUSC\*4401 Honours Music Recital S,F,W (3-0) [0.50]**

First part of the two-semester course MUSC\*4401/2. Refer to MUSC\*4401/2 for course description.

*Prerequisite(s):* Completion of the music core.

*Restriction(s):* Permission of the School and registration in an honours major in music.

**MUSC\*4401/2 Honours Music Recital S-F,F-W,W-S [1.00]**

Qualified instrumentalists, vocalists, and composers who have completed the applied music or applied composition course sequences are eligible to present a full-length recital. In the case of composers it is the responsibility of the student to organize performers to present the music. Recital proposals must be submitted to the Director of the School, on the provided form, by the last day of course selection in the previous semester. This is a two-semester course offered over consecutive semesters. When selecting the course, MUSC\*4401 must be selected in the first semester and MUSC\*4402 in the second semester. A grade will not be assigned to MUSC\*4401 until MUSC\*4402 has been completed.

*Prerequisite(s):* Completion of the music core.

*Restriction(s):* Permission of the School and registration in an honours major in music.

**MUSC\*4402 Honours Music Recital S,F,W (3-0) [0.50]**

Second part of the two-semester course MUSC\*4401/2. Refer to MUSC\*4401/2 for course description.

*Prerequisite(s):* Completion of the music core.

*Restriction(s):* Permission of the School and registration in an honours major in music.

**MUSC\*4450 Honours Seminar in Music W (3-0) [1.00]**

The Honours Seminar in Music teaches advanced research methods common to a range of musical investigations: musicology (including ethnomusicology, popular music and jazz), music theory, music pedagogy, and musical creation. In addition, the Honours Seminar in Music allows students to engage in individual research with concentrated energy through a one semester/one credit course in a supportive peer environment. Students will develop a research project proposal for approval by the instructor in the semester prior to enrolling in this course.

*Prerequisite(s):* Completion of the music core.

*Restriction(s):* Instructor consent required.

## Nanoscience

### NANO\*1000 Introduction to Nanoscience F (3-0) [0.50]

This course introduces students to the emerging field of nanoscience. Its representation in popular culture and journalism will be contrasted with the present and near future realities in the field. Current industrial and business applications will be discussed. Guest lectures will be given by faculty performing research in the field. The course also aims to help students in their transition to the academic life by emphasizing skills and values such as academic integrity and problem solving and by actively connecting their first-year science core courses to the field of nanoscience.

*Prerequisite(s):* 4U Chemistry or 4U Physics

*Restriction(s):* Registration in Nanoscience Major.

### NANO\*2000 Synthesis of Nanomaterials F (3-3) [0.50]

This course explores the structure of matter, focussing on condensed phases. Crystalline and amorphous materials as well as polymers and composites will be studied. Structural, mechanical, and electronic properties will be highlighted and the changes in these properties that are observed as the dimensions are reduced below 100 nm in size will be studied. Methods to fabricate nanoparticles, nanocomposites, thin films, polymers, ferrofluids, and other nanomaterials will be discussed.

*Prerequisite(s):* CHEM\*1050, MATH\*1210, PHYS\*1010

*Restriction(s):* Registration in Nanoscience Major.

### NANO\*2100 Analysis of Nanomaterials W (3-3) [0.50]

This course provides an in-depth study of the important instruments that have been developed to analyze nanostructured materials. Useful information that is derived from scattering processes involving X-rays, visible light, electrons, and neutrons will be studied. Microscopic techniques such as Atomic Force Microscopy will also be studied because of the nanoscale structural information that they can provide. The study of spectroscopic techniques also forms part of the course. The application of these instruments to lithographic production techniques is also developed.

*Prerequisite(s):* NANO\*2000

### NANO\*3200 Nanolithographic Techniques W (3-3) [0.50]

Lithographic techniques applied at the micrometer and nanometer scale are key to the production of devices for the electronic and related industries. Projection and proximity techniques (XUV, electron, and ion beams) and writing processes (electron beam, ion beam, and scanned probe) will be explored. Emphasis will also be placed on soft lithographic techniques such as stamping and dip-pen nanolithography.

*Prerequisite(s):* NANO\*2100

### NANO\*3300 Spectroscopy of Nanomaterials W (3-3) [0.50]

The interaction of nanostructured matter with light gives rise to some of its most important observable properties. The absorption and fluorescence properties of nanomaterials will be studied. Particular attention will be paid to experiments which require nanoscale path lengths, such as IR spectroscopy of monomolecular thin films. Local spectroscopic probes with nanoscale resolution such as Near-field Scanning Optical Microscopy (NSOM) and Scanning Probe Spectroscopy (SPS) will be explored.

*Prerequisite(s):* NANO\*2100, (CHEM\*3860 or PHYS\*3230)

### NANO\*3500 Thin Film Science F (3-3) [0.50]

The deposition and growth of thin layers of materials is an important process on the production of many devices. This course will study the various methods by which thin films are grown including physical and chemical vapour deposition, molecular beam epitaxy, atomic layer epitaxy, and self-assembled monolayers. Experimental techniques for analyzing the properties of thin films will also be discussed.

*Prerequisite(s):* NANO\*2100

### NANO\*3600 Computational Methods in Materials Science F (3-3) [0.50]

Many computational techniques have been brought to bear on the study of nanostructured matter. This course will present several of these techniques and will introduce a number of computational packages that can be used to study matter. Monte Carlo and ab initio methods along with molecular dynamics simulations will be studied, with an emphasis upon the implementation of the software packages and the appropriate interpretation of the results.

*Prerequisite(s):* MATH\*2160, MATH\*2170, CIS\*1500 is highly recommended

*Co-requisite(s):* CHEM\*3860 or PHYS\*3230

### NANO\*3700 Introduction to Quantum Computing W (3-0) [0.50]

This course is an introduction to quantum computation and quantum information. Following an introduction to the basics of linear algebra, quantum mechanics, and computer science, the topics covered will be taken from the following: qubits, quantum channels, quantum circuit model and unitary gates, entanglement and quantum teleportation, introductory quantum algorithms, physical error models, no-cloning theorem, error-correcting codes, and quantum error correction.

*Prerequisite(s):* MATH\*2160, (CHEM\*3860 or PHYS\*3230)

### NANO\*4100 Biological Nanomaterials F (3-0) [0.50]

Biological systems provide a rich range of examples of specialized chemical systems that are structured on the nanoscale. Nanofibres, microtubules, viruses, and ribosomes are examples of systems that can be studied from the perspective of nanoscience. Using these systems or developing artificial systems which mimic their functionality are important growth areas in nanoscience and will be explored in this course.

*Prerequisite(s):* NANO\*2100

### NANO\*4200 Topics in Nanomaterials W (3-0) [0.50]

This course will introduce students to special topics in nanostructured materials. The course will illustrate how to design, create, characterize and utilize new materials in which the presence of a nanoscale structural elements results in new properties of fundamental and technological importance.

*Prerequisite(s):* NANO\*3300, NANO\*3500, (CHEM\*3860 or PHYS\*3230)

### NANO\*4500 Quantum Algorithms F (3-0) [0.50]

This course studies important algorithms being developed in the field of quantum computing. Topics covered will include a selection from the following: review of the quantum circuit model, classical versus quantum algorithms, phase kick-back, DeutschJozsa algorithm, Simon's algorithm, quantum Fourier transform, Shor's factoring algorithm, Grover's search algorithm, and an introduction to quantum computational complexity.

*Prerequisite(s):* NANO\*3700

### NANO\*4510 Quantum Cryptography and Error Correction W (3-0) [0.50]

This course introduces the basics of quantum error correction and considers applications to quantum cryptography. Topics covered will include a selection from: private key cryptography, quantum key distribution, security and coherent information, private quantum channels, error models, recovery and testable conditions for error correction, stabilizer codes, introduction to fault tolerant quantum computing, and the threshold theorem.

*Prerequisite(s):* NANO\*3700

### NANO\*4900 Advanced Studies in Nanoscience S,F,W (1-5) [0.50]

This course will guide students through the primary literature of the field and assign readings from recent achievements. Students will select individual topics on which they will prepare a major paper and present an oral seminar or a poster.

*Prerequisite(s):* 1.50 credits in NANO courses at the 3000 level.

*Restriction(s):* Instructor consent required.

### NANO\*4910 Nanoscience Research Project S,F,W (0-6) [0.50]

Students will work with faculty in their laboratories on research topics of current interest. A final written paper and oral presentation of the work will be given by the students.

*Prerequisite(s):* 1.50 credits in NANO courses at the 3000 level.

*Restriction(s):* Instructor consent required.

## Neuroscience

### NEUR\*4000 Current Issues in Neuroscience F (3-0) [0.50]

This course will consist of guest lectures offered by faculty who are working in the field and will complement the seminars given by the students on topics that they have prepared in studying the primary literature. Students will also prepare a major paper on a neuroscience topic.

*Prerequisite(s):* 12. 50 credits

*Restriction(s):* Enrolment restricted to Neuroscience minor.

### NEUR\*4401 Research in Neurosciences S,F,W (0-6) [0.50]

This is the first part of the two-semester course NEUR\*4401/2. Refer to NEUR\*4401/2 for the course description. Department of Biomedical Sciences.

*Prerequisite(s):* 14.00 credits

*Restriction(s):* BIOM\*4510, BIOM\*4521/2, NEUR\*4450. Instructor consent required. Enrolment restricted to Neuroscience minor.

### NEUR\*4401/2 Research in Neurosciences S-F,F-W,W-S (0-6) [1.00]

In this course, students will conduct independent research of a current topic in any of the biomedical neurosciences: (such as anatomy, physiology, pharmacology, toxicology, molecular biology, biochemistry). Students work under the supervision of individual faculty. Faculty consent must be obtained prior to being admitted into the course by the course coordinator. This is a two-semester course offered over consecutive semesters. When you register for this course you must select NEUR\*4401 in the first semester and NEUR\*4402 in the second semester. A grade will not be assigned in NEUR\*4401 until NEUR\*4402 has been completed. Department of Biomedical Sciences.

*Prerequisite(s):* 14.00 credits

*Restriction(s):* BIOM\*4510, BIOM\*4521/2, NEUR\*4450. Instructor consent required. Enrolment restricted to Neuroscience minor.

### NEUR\*4402 Research in Neurosciences S,F,W (0-6) [0.50]

This is the second part of the two-semester course NEUR\*4401/2. Refer to NEUR\*4401/2 for the course description. Department of Biomedical Sciences.

*Prerequisite(s):* NEUR\*4401

*Restriction(s):* BIOM\*4510, BIOM\*4521/2, NEUR\*4450. Enrolment restricted to Neuroscience minor.

### NEUR\*4450 Research in Neurosciences S,F,W (0-12) [1.00]

In this course, students will conduct independent laboratory research on a current topic in any of the biomedical neurosciences (such as anatomy, physiology, pharmacology, toxicology, molecular biology, biochemistry). Students work under the supervision of individual faculty. Faculty consent must be obtained prior to being admitted into the course by the course coordinator. Department of Biomedical Sciences.

*Prerequisite(s):* 14.00 credits

*Restriction(s):* BIOM\*4510/2, BIOM\*4521/2, NEUR\*4401/2. Instructor consent required. Enrolment restricted to Neuroscience minor.

## Natural Resource Studies

School of Environmental Sciences

### **NRS\*2050 The Landscape of Scotland W (3-0) [0.50]**

This course enables you to explore the Scottish landscape and its natural resources through a major research project, on any topic from geology, through forestry, agriculture, parks and recreation, to modern tourism. You will consider the relationship between the land itself, its history, and the use made of that land today. The course will emphasize recognizing relationships between the natural environment and human society and considering how we manage that relationship. (Offered through Distance Education only.)

### **NRS\*2120 Introduction to Environmental Stewardship S,F (3-2) [0.50]**

This course provides an introduction to the concepts of resource management, environmental planning and assessment, land stewardship and sustainable development. Case studies of specific issues such as parks and natural heritage conservation, agricultural land loss, and integrated rural resources management will provide insight on approaches to decision making. Included will be discussion of the concept of stewardship as an environmental ethics. (Also offered through Distance Education format.)

*Equate(s):* SOIL\*2120

### **NRS\*3000 Environmental Issues in Agriculture and Landscape Management W (3-2) [0.50]**

This course provides an introduction to a range of specific environmental and resource issues in agriculture and landscape management. Issues to be covered include geological resources, climate change, nutrient management, groundwater contamination, source water protection, land use planning, and natural resources management. In each case, the policy context for the issue is presented, as well as the science needed for understanding and preparation of management decisions. This course is designed to suit students in a variety of science programs including Agriculture.

*Prerequisite(s):* AGR\*2320 or SOIL\*2010

*Equate(s):* SOIL\*3000

*Restriction(s):* AGR\*2301 , SOIL\*2200

### **NRS\*3030 Conservation Field Course F (0-6) [0.50]**

This course provides an opportunity for students to practice field skills in natural resource sciences. Topics will include forestry, ecological restoration, stream and wetland conservation, park and trail management, and nature conservation. Use of air photography and mapped data together with field guides will be emphasized. Guest professionals will assist with instruction on some topics, providing an opportunity for exposure to careers in this field. The course requires participation in a two week field experience held in early May, followed by field work during the summer, and a reflective evaluation in the Fall semester. This course must be recorded as part of your Fall course section and tuition and compulsory fees will be calculated accordingly. There is an extra fee to partially cover field costs.

*Prerequisite(s):* 9.00 credits of a relevant program, such as all majors in the B.Sc.(Env.), or other degree programs such as Geography, Ecology, Agriculture.

*Restriction(s):* Instructor consent required.

### **NRS\*3100 Resource Planning Techniques W (2-2) [0.50]**

This is an intermediate techniques course directed at the application of a systematic approach to problem solving in natural resource management. Major topics include procedures of ecological land classification, computer-assisted resource analysis and environmental impact assessment.

*Prerequisite(s):* SOIL\*3050

*Equate(s):* SOIL\*3100

### **NRS\*4110 Natural Resources Management Field Camp F (0-6) [0.50]**

This course investigates methods of collecting and processing land resource field data and includes practice in mapping information from air photographs and ground surveys, construction of inventory maps and integration of information. The course will consist of a one-week field camp prior to the fall semester, following which the students, working in groups, will prepare and present a comprehensive report in consultation with faculty. Students will be responsible for their living and transportation expenses for the field session, in addition to regular tuition fees. The course may be offered with different emphasis in content depending on student demand. Students are required to notify the designated departmental instructor of their intention to participate in the Field Camp during the previous Winter semester (or earlier if going on exchange programs).

*Prerequisite(s):* NRS\*3100 or SOIL\*3100

*Equate(s):* SOIL\*4110

*Restriction(s):* Registration in B.Sc.Env.(NRM) and B.Sc.Agr.(AGMN). Instructor consent required.

## Nutrition

*Department of Animal and Poultry Science*

*Department of Family Relations and Applied Nutrition*

*Department of Human Health and Nutritional Sciences*

### **NUTR\*1010 Nutrition and Society F,W (3-0) [0.50]**

This course examines the significance of nutrition in terms of individuals and societies throughout the world. Factors involved in the application of knowledge of nutritional needs and food selection. Department of Family Relations and Applied Nutrition. (Also offered through Distance Education format.)

*Restriction(s):* This is a Priority Access Course for B.A.Sc. and FCS minor and some restrictions may apply during some time periods

### **NUTR\*2050 Family and Community Nutrition F (3-0) [0.50]**

Nutritional needs through the life cycle and their significance in family and community health. Department of Family Relations and Applied Nutrition. (Also offered through Distance Education format.)

*Prerequisite(s):* NUTR\*1010

*Restriction(s):* NUTR\*3010

### **NUTR\*2150 Introduction to Nutritional and Food Sciences F (3-0) [0.50]**

This interdisciplinary course provides an introduction to the Food and Nutritional Sciences from both historical and modern perspectives. Major themes are the nutritional and functional properties of food, nutrient assimilation, food preservation and safety, and the interactions between food processing, diets and health. The course is taught by the Department of Food Science. (Also listed as FOOD\*2150.)

*Prerequisite(s):* (BIOL\*1040 or BIOL\*1080), CHEM\*1040

*Equate(s):* FOOD\*2150

*Restriction(s):* FOOD\*2010, FOOD\*3090. Not available to students registered in B.A.Sc. AHN major

### **NUTR\*3070 Nutrition and Physical Activity Interventions W (3-0) [0.50]**

This course examines the development, implementation, and evaluation of a) integrated interventions to improve both nutrition and physical activity behaviours and b) interventions to improve physical activity behaviours of people of different ages in various settings. Various theories and models used to develop nutrition and physical activity interventions will be examined. Department of Family Relations and Applied Nutrition.

*Prerequisite(s):* FRHD\*3070, NUTR\*2050

*Restriction(s):* Registration in the B.A.Sc. program.

### **NUTR\*3090 Clinical Nutrition I W (3-3) [1.00]**

The epidemiology, pathophysiology, and role of nutrition will be considered in the prevention and management of several major chronic conditions including cardiovascular diseases, disorders of energy balance and diabetes mellitus. There is an emphasis on developing the skills for high risk individual management approaches. Department of Family Relations and Applied Nutrition.

*Prerequisite(s):* BIOM\*2000, FRHD\*3070, NUTR\*2050, ( NUTR\*3190 or NUTR\*3210), STAT\*2090

*Co-requisite(s):* FRHD\*3400

*Restriction(s):* NUTR\*3040 . Registration is limited to students registered in the B.A.Sc. AHN major.

### **NUTR\*3110 Food Security W (3-0) [0.50]**

The prevalence of food insecurity in Canada and selected industrialized and non-industrialized countries is examined. The course will review environmental, social, and other factors associated with food insecurity and take critical look at the effectiveness of programs and policies designed to improve food security. Department of Family Relations and Applied Nutrition.

*Prerequisite(s):* 9.50 credits including NUTR\*2050

*Restriction(s):* Registration is limited to students registered in the B.A.Sc. AHN major

### **NUTR\*3150 Aging and Nutrition W (3-0) [0.50]**

This course provides an in-depth study of the determinants of food intake and nutrient recommendations for aging adults. Specific consideration will be given to eating environments and physiological changes that influence access, preparation, and consumption of food by older adults living in the community and in facilities. An emphasis will be placed on chronic disease prevention and management. Department of Family Relations and Applied Nutrition.

*Prerequisite(s):* 1 of NUTR\*1010, NUTR\*2150, NUTR\*3210

*Restriction(s):* NUTR\*2070

### **NUTR\*3210 Fundamentals of Nutrition F,W (3-0) [0.50]**

This is the foundation course for the study of nutrition. The occurrence, uptake and metabolic role of nutrients will be discussed in relation to growth, reproduction and longevity in human subjects, domestic animals and other species. Department of Human Health and Nutritional Sciences.

*Prerequisite(s):* BIOC\*2580

### **NUTR\*3330 Micronutrients, Phytochemicals and Health F (3-0) [0.50]**

The course emphasizes the biochemical basis for the dietary essentiality of vitamins and minerals. The course extends the fundamentals of nutrition to include conditional essentiality of micronutrients, biochemical individuality and the use of micronutrient supplementation to promote human and animal health. Both plant and animal sources of nutrients are discussed. Department of Human Health and Nutritional Sciences.

*Prerequisite(s):* NUTR\*3210

### **NUTR\*3390 Applied Nutritional and Nutraceutical Sciences I F (3-3) [0.75]**

This course will introduce and develop key concepts of the applied aspects of the Nutritional and Nutraceutical Sciences. Enrichment of foods with health protectant chemicals, establishing biomarkers and risk indicators of disease, testing of bioavailability/efficacy to support basic health claims, health assessment and nutrigenomic analysis as adjuvants in the effective use of functional foods and nutraceuticals, and regulatory and marketing/consumer issues are topics that will be addressed. Department of Human Health and Nutritional Sciences

*Prerequisite(s):* NUTR\*3210

*Restriction(s):* Registration in the B.Sc. NANS major or minor and the B.Sc. FFAN minor.

### **NUTR\*4010 Nutritional Assessment F (3-3) [0.75]**

This course examines the principles and methods used in nutritional assessment of individuals and populations in health and disease states. Dietary, anthropometric and biochemical techniques will be primary components. Nutritional screening, advanced techniques for body composition assessment, physical exam and clinical indicators will also be addressed. Laboratories will provide the students with hands-on training of diet and anthropometric methods. Cases will be used to develop the understanding of the concepts discussed in lectures and expand on the ethical treatment of individual and group data. Significant independent learning will be required. Department of Family Relations and Applied Nutrition.

*Prerequisite(s):* 14.50 credits including NUTR\*2050, NUTR\*3210

*Restriction(s):* Registration in the B.A.Sc. AHN major.

### **NUTR\*4040 Clinical Nutrition II F (3-3) [0.75]**

This course is a continuation of NUTR\*3040 . This lecture and laboratory based course is concerned with the application of nutrition to clinical problems. Methods and content of medical nutrition therapy in prevention and treatment of gastrointestinal, renal, hepatic diseases and catabolic states will be emphasized. Ethical issues in nutrition management of disease and health professional practice will be addressed. A case study based course. Department of Family Relations and Applied Nutrition.

*Prerequisite(s):* 14.50 credits including, [1 of BIOM\*2000, ( BIOM\*3100 or BIOM\*3110 )], NUTR\*3040

*Restriction(s):* Registration in the B.A.Sc. AHN major

### **NUTR\*4070 Nutrition Education F (3-0) [0.50]**

This course covers methods and approaches in nutrition education with particular emphasis on community programs in nutrition for different age groups; dietary counselling; nutrition education in the preschool, in prenatal and other specialized programs. Department of Family Relations and Applied Nutrition.

*Prerequisite(s):* FRHD\*3400, NUTR\*2050

*Restriction(s):* This is a Priority Access course. Registration may be restricted to students registered in B.A.Sc. majors and the Family and Child Services minor during certain time periods.

### **NUTR\*4090 Functional Foods and Nutraceuticals W (3-0) [0.50]**

The course examines the relation of functional foods and nutraceuticals (FFN) to foods and drugs. The safety and efficacy of individual FFN products, and the regulatory issues that influence the development and commercialization of FFN in global markets are emphasized. The course is co-operatively taught by the Department of Human Health and Nutritional Sciences and the Department of Food Science. (Also listed as FOOD\*4090.)

*Prerequisite(s):* NUTR\*3210

*Equate(s):* FOOD\*4090



**NUTR\*4120 Applied Clinical Skills W (0-3) [0.50]**

This is a laboratory-based course which will enable students to gain skills in independently completing nutrition assessments and care plans of individuals and groups as they would be expected to do as nutrition professionals. Students will comprehensively assess nutritional status, apply knowledge of human physiology, pathophysiology, medical terminology and nutritional assessment to diagnose nutritional problems/issues and formulate, implement and evaluate a nutrition intervention. (First offering Winter 2013)

*Prerequisite(s):* NUTR\*4010, NUTR\*4040

*Restriction(s):* NUTR\*4850. Restricted to students in B.A.Sc. AHN with at least 75% grade average in all completed NUTR and FRHD courses.

**NUTR\*4210 Nutrition, Exercise and Energy Metabolism F (3-0) [0.50]**

In this course energy metabolism will be considered under the headings: thermodynamic principles, energy deposition and hormonal control of metabolism; nutrition, exercise and environmental influences on energy balance and enzyme adaptation; nutrition and exercise in the control of body composition. Department of Human Health and Nutritional Sciences.

*Prerequisite(s):* NUTR\*3210, (1 of BIOM\*3110 , BIOM\*3200, HK\*3940)

**NUTR\*4320 Nutrition and Metabolic Control of Disease W (3-0) [0.50]**

This course provides a discussion of disorders of metabolism, either inherited or acquired, in which nutrition plays a major role in the etiology, pathogenesis, or treatment. The nutritional control of the affected metabolic pathways and the interaction of nutrition with exercise, drugs and gene therapy will be presented. Department of Human Health and Nutritional Sciences.

*Prerequisite(s):* NUTR\*3210, (1 of BIOM\*3110 , BIOM\*3200, HK\*3940, ZOO\*3210)

**NUTR\*4330 Applied Nutritional and Nutraceutical Sciences II W (3-3) [0.75]**

In this course laboratory and other investigational techniques are covered, together with their underlying concepts. The course is designed to enhance understanding of the design and use of nutraceuticals for human and animal health. Department of Human Health and Nutritional Sciences.

*Prerequisite(s):* NUTR\*3210, NUTR\*3330, NUTR\*3390, HK\*3940

*Restriction(s):* Registration in B.Sc. NANS major or minor.

**NUTR\*4350 Current Issues in Nutrition F (3-0) [0.50]**

This course discusses controversial and/or emerging topics in Human Biology and Nutritional and Nutraceutical Sciences. Topics of current interest will be announced during the course selection period. Department of Human Health and Nutritional Sciences.

*Prerequisite(s):* NUTR\*3210, HK\*3940

**NUTR\*4360 Current Issues in Nutrigenomics W (3-0) [0.50]**

This course discusses controversial and/or emerging topics in Human Health and Nutritional and Nutraceutical Sciences as it relates to nutrigenomics. Department of Human Health and Nutritional Sciences.

*Prerequisite(s):* NUTR\*3210, (BIOM\*3200 or HK\*3940)

**NUTR\*4510 Toxicology, Nutrition and Food F (3-0) [0.50]**

This course examines the role of foods, herbals and nutraceuticals as sources of antinutrients, natural toxins and environmental contaminants. The impact of toxic exposures on nutritional status, the impact of nutritional status on safe metabolism of toxins, and the use of this knowledge in the design of functional foods are also examined. Assessing the risk of genetically modified foods and radioactive contamination of a food supply. Department of Human Health and Nutritional Sciences.

*Prerequisite(s):* NUTR\*3210

**NUTR\*4810 Applied Human Nutrition Thesis I U (3-0) [0.50]**

Planning, developing and writing a research proposal under individual faculty supervision. Topic to be decided by the student in consultation with the supervisory faculty member before course selection or registration period. Department of Family Relations and Applied Nutrition.

*Prerequisite(s):* FRHD\*3070, NUTR\*2050, NUTR\*3040

*Restriction(s):* Instructor consent required.

**NUTR\*4850 Field Experience in Nutrition Education W (2-4) [0.50]**

This course offers a supervised experience in nutrition education and a seminar. Students will apply principles of program planning, nutrition education theory and professional behaviour in a community setting. Placements may be arranged in institutional or community health settings, educational facilities, social services, or food industry. Seminar topics include professional ethics, exploring values, and issues management. Department of Family Relations and Applied Nutrition.

*Prerequisite(s):* FRHD\*3400, NUTR\*4040, NUTR\*4070

*Restriction(s):* NUTR\*4120. Instructor consent required.

**NUTR\*4900 Selected Topics in Human Nutrition W (3-0) [0.50]**

This course requires reading and discussion on selected areas in human nutrition and its application; formal class reports and term papers. Primarily for Applied Human Nutrition majors. Department of Family Relations and Applied Nutrition.

*Prerequisite(s):* FRHD\*3070, NUTR\*3040 , NUTR\*4010

*Restriction(s):* Registration in B.A.Sc. AHN major

**NUTR\*4910 Applied Human Nutrition Thesis II U (6-0) [1.00]**

The student will conduct and write an undergraduate thesis under the direction of a faculty member.

*Prerequisite(s):* NUTR\*4810

## Organic Agriculture

<b>OAGR*2050 Gateway to Organic Agriculture F (3-3) [0.50]</b>	
This introductory course will expose students to the scale of the organic industry today, including the factors driving interest in organics for both producers and consumers. The foundational ecological, economic and social principles underlying contemporary organic agriculture will be presented. First hand experience of current organic practices will be provided through factors driving interest in organics for both producers and consumers. The foundational ecological, economic and social principles underlying contemporary organic agriculture will be presented. First hand experience of current organic practices will be provided through and from site interviews with practitioners in the field	
<i>Prerequisite(s):</i>	5.00 credits
<i>Equate(s):</i>	CROP*2050
<i>Restriction(s):</i>	CROP*3400
<b>OAGR*2300 Organic Marketing F,W (3-0) [0.50]</b>	
In this course economic theory of markets principles are applied to the marketing of organically-produced and processed products through exploring open market price formation, value added, marketing margins, alternative marketing outlets and branding. Adherence to organic production and marketing standards, quality management, supply chain management, and advertising and promotion issues are also addressed. (Offered in Distance Education format only.)	
<i>Prerequisite(s):</i>	ECON*1050 or MCS*1000
<i>Equate(s):</i>	AGEC*2300
<b>OAGR*3030 Tutorials in Organic Agriculture 1 F (3-2) [0.50]</b>	
This course will rely on small group mentoring to stimulate independent, learner-centered analysis of selected topics in organic agriculture. Topics will centre on nutrient management of organic farms, and related topics such as food quality and safety, energy use efficiency and greenhouse gas emissions, animal welfare and traceability. Seminar periods will support student-led discussion of assigned readings, student presentations and guest speakers.	
<i>Prerequisite(s):</i>	1 of CROP*2050 , OAGR*2050,
<i>Equate(s):</i>	SOIL*3030
<b>OAGR*3130 Tutorials in Organic Agriculture II W (3-2) [0.50]</b>	
This course will rely on small group mentoring to stimulate independent, learner-centered analysis of selected topics in organic agriculture. Students will explore methods for production of high quality, organic products including seed collection and storage, weed control options underlying crop production, practices, and harvesting and handling methods. Students will have an opportunity to conduct in-depth research in the form of a case study of organic agricultural practices in a country of their choice. Seminar periods will support student-led discussion of assigned readings, student presentations and guest speakers.	
<i>Prerequisite(s):</i>	1 of CROP*2050 , OAGR*2050,
<i>Equate(s):</i>	CROP*3130
<b>OAGR*4160 Design of Organic Production Systems F (2-3) [0.50]</b>	
This interdisciplinary course applies organic principles to managed agroecosystems. It covers the interactions of soils, plants and animals with managerial and environmental factors for production of annual and perennial crops and livestock. The core principle of problem avoidance rather than problem solving is illustrated with examples and exercises on integration of crop and livestock agriculture, farm scale nutrient budgeting, permaculture, and herd health in the production of organic field crops, horticultural crops, and livestock.	
<i>Prerequisite(s):</i>	(1 of AGR*2350, CROP*4220, SOIL*4250) or (OAGR*3030, OAGR*3130)
<i>Equate(s):</i>	SOIL*4160
<b>OAGR*4180 Social Issues in Organic Agriculture W (2-2) [0.50]</b>	
This interdisciplinary course will examine the major social issues in organic agriculture from both a global and local perspective, with an emphasis on synthesis and integration. Issues will include globalization, sustainability, gender, food, social movements, the organic agri-food system, rural communities, and the role of the family farm.	
<i>Prerequisite(s):</i>	1 of EDRD*3400, (OAGR*3030, OAGR*3130), SOC*2080
<i>Equate(s):</i>	EDRD*4180 , REXT*4180

## Pathology

*Department of Pathobiology*

*Additional course listings may be found in the course descriptions for Veterinary Medicine.*

### **PATH\*3040 Principles of Parasitology W (3-3) [0.50]**

Parasitism is the most common biological association on the planet; virtually all organisms are parasitized by numerous parasites and many, such as the protists that cause malaria, are responsible for serious medical and/or veterinary diseases. This course will provide an in depth introduction to parasites and parasitism by exploring common protists, helminths and arthropods that infect animals and humans globally. The nature of parasitism will be explored by examining the development and transmission of many common parasitic agents, including their pathogenesis, zoonotic potential, diagnosis and treatment options.

*Prerequisite(s):* 10.00 credits including at least 1.50 credits in biology.

### **PATH\*3610 Principles of Disease W (3-0) [0.50]**

A course designed for students with particular interests in nutrition and biology. The course presents basic concepts of disease in the cells, tissues, organs and fluids of the body. Emphasis will be on disease processes resulting from physical, toxic and microbiological and other causes. (Also offered through Distance Education format.)

*Prerequisite(s):* 1.50 credits in biology

*Restriction(s):* PATH\*3600

### **PATH\*4100 Diseases of Aquatic Animals F (2-2) [0.50]**

A course designed to familiarize the fisheries manager, researcher or veterinarian with the basic principles of diagnosis, prevention, and control of disease of free living and captive aquatic animals, with emphasis on fish. (Offered in odd-numbered years.)

*Prerequisite(s):* PATH\*3610

## Pharmacology

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*Department of Biomedical Sciences.*

*For course listings and descriptions see Biomedical Sciences.*

*Additional course listings may be found in the course descriptions for Veterinary Medicine and Toxicology.*

## Philosophy

### Department of Philosophy

**Note:** *Specific descriptions of all courses to be offered in a given semester will be available from the Department of Philosophy in each preceding semester. Students are advised to consult these descriptions. Different sections of a course often emphasize different aspects of that course.*

1. All 2000 level philosophy courses are open to students who have completed 5.00 credits or who have completed one of PHIL\*1000, PHIL\*1010, PHIL\*1050.
2. Unless otherwise noted, 3000 level philosophy courses are open to students who have completed at least 1.50 credits in philosophy or 7.50 credits.
3. For most 4000 level courses, students are expected to have completed at least 1.00 credits in philosophy at the 3000 level. Some 4000 level credits have specific prerequisites, e.g. PHIL\*4320, PHIL\*4360 (see course descriptions in the following pages). If a student is taking several credits with such prerequisites, then the number of other philosophy credits which need to be completed may exceed the general requirement of 1.00 credits at the 3000 level. PHIL\*4310 is designed to be open to seventh and eighth semester students who have no previous philosophy credit. If in doubt about being well prepared for a particular course, the student should consult with either the instructor or the chair of the department.
4. Students may receive credit for PHIL\*1000, PHIL\*1010 and PHIL\*1050, but only one may be counted towards the minimum number of philosophy credits required for a degree in philosophy. Students intending to proceed in the discipline at the 2000 level are advised to take only 0.50 credits at the 1000 level.

#### PHIL\*1000 Introductory Philosophy: Major Texts F,W (3-0) [0.50]

This course will deal with enduring philosophical questions through an exploration of primary texts in the history of philosophy. Topics covered may include the nature of knowledge and the different types of knowledge, the relationship between the mind and the body, and the nature of good and evil. Texts and topics will vary with the instructor; students are advised to consult the Philosophy department's website: <http://www.uoguelph.ca/philosophy/>.

#### PHIL\*1010 Introductory Philosophy: Social and Political Issues F,W (3-0) [0.50]

This course introduces philosophy through an examination of important issues in politics and society, such as punishment, animal rights, discrimination, war and violence, equality and property. These issues may be introduced through contemporary or historical philosophical writings.

#### PHIL\*1050 Introductory Philosophy: Basic Problems F,W (3-0) [0.50]

This course introduces students to philosophy through the exploration of basic perennial philosophical problems and questions, such as whether there is free will, a God, objective right and wrong, genuine knowledge of the world, and other topics. The readings for the course will consist primarily of 20th century philosophical writing.

#### PHIL\*2030 Philosophy of Medicine F,W (3-0) [0.50]

Medicine is a philosophical, not merely a practical, empirical enterprise. This course covers philosophical concepts which are widely used to evaluate health and health-practices include: autonomy, consent, mind, will, rights, harm, fairness, dignity, truth and even 'health' itself. Issues central to health and health care practice include: the nature of professional-client relationships, genetic counseling, passive and active euthanasia, pharmacology and behaviour modification, resource allocation, and the special set of issues raised by reproductive technologies.

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1050)

#### PHIL\*2060 Philosophy of Feminism I W (3-0) [0.50]

This course examines metaphysical, epistemological and ethical issues in feminist philosophy, including such topics as the nature and consequences of patriarchy, human nature, sexual divisions of labour, women's studies, rationalizations of inequalities and explorations into a contemporary feminist agenda for social, political and economic changes.

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1050)

#### PHIL\*2070 Philosophy of the Environment W (3-0) [0.50]

Environmental Philosophy asks questions such as: How has 'nature' been conceptualized in the Western philosophical tradition, in aesthetics, science, and ethics? What arguments have been offered for the view that humans are superior among creatures? What connections might there be between the ways that nature, humankind, and animals have been conceptualized and the ways that humans have tended to act toward the non-human natural environment? This course may cover such topics as: climate change, resource extraction and justice, biotechnology, obligations to future generations, risk assessment and discount rates, species lost, conservation vs. preservation. (Also offered through Distance Education format.)

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1050)

#### PHIL\*2100 Critical Thinking F,W (3-0) [0.50]

This course is designed to develop clarity of thought and method in the analysis and construction of arguments. By contrast to PHIL\*2110, the emphasis here is upon informal principles of critical thinking and arguments stated in terms of ordinary language. Topics include the nature and methods of arguing, classification, definition and fallacies.

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1050)

#### PHIL\*2110 Elementary Symbolic Logic W (3-0) [0.50]

This course studies the basic principles and techniques of formal logic. The analysis of the logical structure of sentences and arguments is explored, together with the fundamental principles of elementary sentential logic and quantification.

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1050)

#### PHIL\*2120 Ethics F,W (3-0) [0.50]

Philosophical ethics is the attempt to systematize, explain, and justify the standards by which we evaluate our conduct as persons. The course may include treatment of controversial ethical issues such as abortion, euthanasia, war, and the treatment of animals and will cover many of the following questions: can we expect to find a single, universal code of ethics that applies to all human beings, or do such codes vary for each society or even for each individual? What are the roles of reason and emotion in ethics? Is morality grounded on a principle, and if so, what is it? Are there any traits of character that one must have to be a good person? Given that traditional ethical codes have been almost universally sexist, how must ethics be refashioned in order for women to achieve equal recognition? (Also offered through Distance Education format.)

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1050)

#### PHIL\*2130 Philosophy of Religion F (3-0) [0.50]

This course considers various philosophical questions concerning religion, such as arguments for the existence of God, the problem of evil, the meaning of religious language, the significance of mystical experience and human immortality. (Offered in even-numbered years.)

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1050)

#### PHIL\*2140 History of Greek and Roman Philosophy F (3-0) [0.50]

A survey of the beginnings of Western philosophy, this course will focus on themes such as the nature of reality, the ways we might come to have knowledge, and the good life for human beings. This course will typically consider such thinkers as Socrates, Plato, Aristotle, Epictetus, Cicero and Seneca, although the specific course content will vary with the instructor.

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1050)

#### PHIL\*2160 Modern European Philosophy to Hume W (3-0) [0.50]

This course surveys European philosophy from the Renaissance (15<sup>th</sup> century) to David Hume (mid-18<sup>th</sup> century).

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1050)

#### PHIL\*2170 Existentialism W (3-0) [0.50]

Existentialism is a philosophy built around the experience of human freedom. This course focuses on the character of the subject who makes choices, and on the personal and political responsibilities that attach to the making of decisions. The course will examine this and other themes associated with Existentialism through nineteenth and twentieth century representatives, which may include Kierkegaard, Sartre, de Beauvoir, Camus and others. (Offered in odd-numbered years.)

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1050)

#### PHIL\*2180 Philosophy of Science F (3-0) [0.50]

As a system of knowledge pursuit, science develops laws and theories to explain, predict, understand, and control empirical phenomena. This course introduces students to many of the challenging assumptions, foundations, and implications of science. Topics include the nature of scientific knowledge, the structure of scientific theories, the distinction between science and pseudo-science, whether there is a scientific method, and how social and political processes influence the way science develops.

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1050)

#### PHIL\*2220 Philosophy and Literary Art F (3-0) [0.50]

The course will engage with literary art forms (fiction, drama, poetry, and film) for philosophical goals. Possible emphases include the use of literary works to express philosophical topics; philosophical investigations of the nature of literary art forms; and philosophies of interpretation of such art forms (e.g., classical poetics, hermeneutics, deconstruction, analytical aesthetics). (Offered in odd-numbered years.)

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1050)

<b>PHIL*2250 Knowledge, Mind and Language F (3-0) [0.50]</b>
This course is an introduction to the nature and possibility of knowledge, in connection with the nature of mind and the role of language in shaping experience. This is a central area of philosophy.
<i>Prerequisite(s):</i> 2.00 credits or (1 of PHIL*1000, PHIL*1010, PHIL*1050)
<b>PHIL*2350 Selected Topics in Philosophy I U (3-0) [0.50]</b>
The topics for this course will vary from one offering to the next, and will deal with material not available in regular courses. Topics for this course will be chosen from the instructor's research in progress. Students are encouraged to consult the departmental website for course content and availability: <a href="http://www.uoguelph.ca/philosophy/">http://www.uoguelph.ca/philosophy/</a> .
<i>Prerequisite(s):</i> 2.00 credits or (1 of PHIL*1000, PHIL*1010, PHIL*1050)
<b>PHIL*2370 Introduction to Metaphysics W (3-0) [0.50]</b>
This course studies major theories of the nature of reality, and of issues and problems that arise in the investigation of fundamental features of the world. Texts read may be either historical or contemporary. Among possible topics explored in the course are materialism, free will, and determinism, the nature of time, and the position of consciousness in the world. (Offered in even-numbered years.)
<i>Prerequisite(s):</i> 2.00 credits or (1 of PHIL*1000, PHIL*1010, PHIL*1050)
<b>PHIL*2600 Business and Professional Ethics W (3-0) [0.50]</b>
This course examines ethical and evaluative issues relating to business and professional practices, and is intended for students registered in a science or professional program, but without a background in philosophy. Topics to be explored include the nature of values and ethical systems, duties and rights, private and public goods, the consumer movement, social marketing, corporate social accounting, private right and professional responsibility.
<i>Prerequisite(s):</i> 2.00 credits or (1 of PHIL*1000, PHIL*1010, PHIL*1050)
<b>PHIL*3040 Philosophy of Law F (3-0) [0.50]</b>
This course is an introduction to the main topics in the philosophy of law. It aims to give students a philosophical grounding in such issues as the purpose and nature of law, the relationship between law and individual freedom and the question of international law. Thinkers studied may include St. Thomas Aquinas, John Stuart Mill and H.L.A. Hart. The course may also include an examination of the way in which controversial ethical and social issues are treated under the Canadian Charter of Rights and Freedoms.
<i>Prerequisite(s):</i> 1.50 credits in Philosophy or 7.50 credits or PHIL*2120
<b>PHIL*3050 Philosophy of Art W (3-0) [0.50]</b>
This course considers various philosophical questions concerning art such as the nature of a work of art, the nature of beauty, the relationship between the artist and the audience, the task of the art critic, the social function of art. (Offered in odd-numbered years.)
<i>Prerequisite(s):</i> 1.50 credits in Philosophy or 7.50 credits
<b>PHIL*3060 Medieval Philosophy W (3-0) [0.50]</b>
The ideas of central figures in philosophy from the Patristic period (3 <sup>rd</sup> century A.D.) to the early Renaissance (14 <sup>th</sup> century) will be examined through original sources. (Offered in odd-numbered years.)
<i>Prerequisite(s):</i> 1.50 credits in Philosophy
<b>PHIL*3080 History of Modern European Philosophy from Kant F (3-0) [0.50]</b>
A survey of European philosophy from Immanuel Kant (mid-18th century) to the late 19 <sup>th</sup> century.
<i>Prerequisite(s):</i> 1.50 credits in Philosophy
<b>PHIL*3090 Philosophy of Kant W (3-0) [0.50]</b>
Kant revolutionized the philosophical tradition of investigating objectivity (asking what the nature of reality is, in itself) by investigating subjectivity (asking how knowledge is possible for us). This course will typically examine one of Kant's Critiques and/or a central philosophical theme that appears in Kant's works. (Offered in even-numbered years.)
<i>Prerequisite(s):</i> 1.50 credits in Philosophy
<b>PHIL*3130 Contemporary British and American Philosophy F (3-0) [0.50]</b>
Ludwig Wittgenstein and other Vienna philosophers of the early 20th century believed that much of traditional philosophy was meaningless word-play, and that the reason many people didn't see this is that it's difficult to distinguish the meaningless from the meaningful. Their attempts to do so - taking what Richard Rorty called "the linguistic turn" - shaped much of 20th century philosophy in English-speaking countries. This course will critically examine the original movement, some attempts to apply its ideas in various areas such as epistemology, ethics and philosophy of mind, and some ideas that arose in reaction to the original movement, e.g., so-called "ordinary language philosophy," neopragmatism and naturalized philosophy.
<i>Prerequisite(s):</i> 1.50 credits in Philosophy or 7.50 credits

<b>PHIL*3170 Critical Debates in the Philosophy of Science W (3-0) [0.50]</b>
This course studies specialized questions about science within a broad intellectual and social context. Contested issues regarding the nature of science, its aims and methods, and science's relation to society will be critically examined. Past offerings of the course have examined such topics as realism and antirealism, naturalized explanations, the unity/disunity of science, and feminist approaches to science. (Offered in even-numbered years.)
<i>Prerequisite(s):</i> PHIL*2180
<b>PHIL*3180 Philosophy of Mind W (3-0) [0.50]</b>
This course is a survey of central issues and positions in contemporary philosophy of mind. Topics may include: the nature of the mind and its relation with the brain; the puzzle of conscious experience; and the problem of mental content. (Offered in even-numbered years.)
<i>Prerequisite(s):</i> 1.50 credits in Philosophy
<b>PHIL*3190 Theory of Knowledge I F (3-0) [0.50]</b>
This course is an advanced introduction to the central issues in epistemology, such as the nature of knowledge and how it differs from mere true belief. Possible topics include skepticism, theories of justification and rationality, self-knowledge and the sources of belief. (Offered in odd-numbered years.)
<i>Prerequisite(s):</i> 1.50 credits in Philosophy
<b>PHIL*3200 Contemporary European Philosophy W (3-0) [0.50]</b>
A survey of philosophical movements mainly centred in continental Europe from the late 19 <sup>th</sup> -century to the present.
<i>Prerequisite(s):</i> 1.50 credits in Philosophy
<b>PHIL*3210 Women in the History of Philosophy F (3-0) [0.50]</b>
This course will examine selected works of women philosophers and their contributions to the major philosophical debates of their day. The philosophers covered may be drawn from any period in the history of philosophy, up to, and including, the 20 <sup>th</sup> century and topics covered have ranged across feminist issues, epistemology, metaphysics, and ethics. Because texts and topics will vary with the instructor, students are advised to consult the departmental website: <a href="http://www.uoguelph.ca/philosophy/">http://www.uoguelph.ca/philosophy/</a> . (Offered in odd-numbered years.)
<i>Prerequisite(s):</i> 1.50 credits in Philosophy or 7.50 credits
<b>PHIL*3230 Issues in Social and Political Philosophy W (3-0) [0.50]</b>
Social or political philosophy is the area of philosophy concerned with the morality of major social institutions such as the state, the economy, and the family. This course may engage in the detailed examination of one or more of the following questions: what justifies the state's claim to authority? What are the proper dimensions of individual liberty? What levels of material and social equality are required for a society to be just? These questions will be pursued through reading historical and/or contemporary philosophical texts. (Offered in even-numbered years.)
<i>Prerequisite(s):</i> 1.50 credits in Philosophy or 7.50 credits
<b>PHIL*3240 Philosophy of Technology F (3-0) [0.50]</b>
This course examines the philosophical problems associated with technology. Topics may include the nature of technology, the relation between technology and science, and the various critiques of technology - religious, political, ethical and existentialist - in contemporary society. (Offered in odd-numbered years.)
<i>Prerequisite(s):</i> 1.50 credits in Philosophy or 7.50 credits.
<b>PHIL*3250 Philosophy of Language F (3-0) [0.50]</b>
This course will explore the relationship between human beings and language, and between language and the world. In particular, it may address such fundamental questions as: What is it about the way in which we use words that gives them the meanings they have? And what is the relationship between words and objects to which they refer? Authors studied may include representatives from the analytic and/or continental traditions in philosophy. (Offered in even-numbered years.)
<i>Prerequisite(s):</i> 1.50 credits in Philosophy or 7.50 credits
<b>PHIL*3280 21st Century Philosophy F (3-0) [0.50]</b>
This course is an introduction to the most current philosophical texts and movements developed since the beginning of the 21 <sup>st</sup> Century. Students will be taught to understand and work creatively with the most recent ideas in the discipline. Material covered will focus almost exclusively on the philosophical texts written in or after the year 2000.
<i>Prerequisite(s):</i> 1.50 credits in Philosophy

**PHIL\*3350 Selected Topics in Philosophy II U (3-0) [0.50]**

The topics for this course will vary from one offering to the next, and will deal with material, such as Philosophy of History, Philosophy of Social Science and advanced Philosophy of Religion generally arising from the instructor's current research interests. This course gives students a chance to explore topics and texts not usually covered in other courses at a more advanced level than PHIL\*2350. Students are encouraged to consult the departmental website for course content and availability: <http://www.uoguelph.ca/philosophy/>.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

**PHIL\*3410 Major Texts in the History of Philosophy W (3-0) [0.50]**

This course will consider central and continuing philosophical issues through an exploration of primary texts in the history of philosophy. The readings and periods stressed will vary from year to year, but could cover significant and enduring texts from the ancient period right up to the 21<sup>st</sup> century. Texts and topics will vary with the instructor; students are advised to consult the Philosophy department's website: <http://www.uoguelph.ca/philosophy/>.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

**PHIL\*3420 Philosophical Problems of Religion F (3-0) [0.50]**

The course offers a detailed examination of major problems and writings in the philosophy of religion. (Offered in odd-numbered years.)

*Prerequisite(s):* 1.50 credits in Philosophy, including one of PHIL\*2130, PHIL\*3910, PHIL\*3920

**PHIL\*3450 Ethics in the Life Sciences W (3-0) [0.50]**

This course is an advanced introduction to the ethical implications of values and practices guiding research in the life sciences. Fields of discussion may include ethics in health care, genetics and human reproduction, environmental sciences, agriculture, animal husbandry, animal welfare, and food technologies. Material covered will be drawn from current books and articles by philosophers in this rapidly expanding area.

*Prerequisite(s):* 1.50 credits in Philosophy. PHIL\*2120, PHIL\*2180 are recommended.

**PHIL\*3710 Directed Reading F,W (3-0) [0.50]**

This course is intended as an intensive course of reading chosen by the student in consultation with the faculty member.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Restriction(s):* Instructor consent required.

**PHIL\*3720 Directed Reading F,W (3-0) [0.50]**

This course is intended as an intensive course of reading chosen by the student in consultation with the faculty member.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Restriction(s):* Instructor consent required.

**PHIL\*3910 Indian Philosophy F (3-0) [0.50]**

This course provides an analysis of selected primary sources of Indian philosophy in translation, from the Vedic Upanishads to the "integral yoga" of Sri Aurobindo. Emphasis will be on the basic inspirational works of Hinduism and Buddhism, and their respective views on the ultimate nature of reality, the self, suffering, freedom, ignorance and enlightenment. (Offered in even-numbered years.)

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

**PHIL\*3920 Chinese Philosophy W (3-0) [0.50]**

This course analyzes selected primary sources of Chinese philosophy, in translation, from the Ching to Mao Tse-tung. Emphasis will be on the foundational works of Confucianism, Taoism, Ch'an (or Zen) Buddhism, and Neo-Confucianism, concerning such issues as the ultimate nature of being, non-being and human destiny, proper government of the self, the family and society, and the principles and practice of enlightenment. (Offered in odd-numbered years.)

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

**PHIL\*3930 African Philosophy F (3-0) [0.50]**

An introduction to the philosophical traditions of Africa, part historical and part contemporary. The shorter historical section will cover some themes from the thought of ancient Egypt, early Christian and Islamic philosophy in North Africa and precolonial traditions from West Africa. The greater section of the course will deal with philosophical movements in Africa since the 1960's, as well as their implications for African American thought and philosophy generally. (Offered in even-numbered years.)

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

**PHIL\*4040 Advanced Philosophy of the Environment U (3-0) [0.50]**

This course is an exploration in detail of central debates in environmental philosophy. Possible topics include: genetic modification of plants and animals, duties to future generations, obligations to distant global others, the ethics of encounters, animal welfare, trans-species communication, restoration and conservation projects, aesthetics, virtue ethics and stewardship.

*Prerequisite(s):* 1.00 credits in Philosophy at the 3000 level. PHIL\*2070 recommended

**PHIL\*4060 Philosophy of Feminism II U (3-0) [0.50]**

This course is an advanced study of problems in feminist philosophy. The course may cover specific topics or the work of one or more feminist philosophers. Topics may be drawn from feminist ethics, epistemology, and/or postmodernism. Texts and topics will vary with the instructor; students are advised to consult the Philosophy department's website: <http://www.uoguelph.ca/philosophy/>.

*Prerequisite(s):* 1.00 credits in Philosophy at the 3000 level or PHIL\*2060

**PHIL\*4110 Symbolic Logic U (3-0) [0.50]**

A study of issues and techniques beyond the level of elementary sentential logic and quantification. A consideration of some topics in logical theory. An extension of material explored in PHIL\*2110, with special focus on philosophical aspects or implications of formal logic.

*Prerequisite(s):* PHIL\*2110, 1.00 credits in Philosophy at the 3000 level

**PHIL\*4160 Philosophy Field Course F (3-0) [1.00]**

This variable content course addresses an issue which is relevant to the contemporary world from a range of philosophical perspectives. The course is built on research into the issue, including material gathered during a 1-2 week field trip which is held in the summer immediately preceding the semester in which the student takes the course. The field trip is a mandatory component of the course, one for which the student assumes the costs of transportation, food and lodging.

*Prerequisite(s):* 13.00 credits and a minimum cumulative average of 70%.

*Restriction(s):* Restricted to students in Philosophy major or minor, or Ethics in the Life Sciences minor. Instructor consent required.

**PHIL\*4230 Social and Political Philosophy U (3-0) [0.50]**

This is an advanced level course that examines in detail selected historical or contemporary treatments of specific issues in social and political philosophy.

*Prerequisite(s):* PHIL\*2120 or PHIL\*3230, 1.00 credits in Philosophy at the 3000 level

**PHIL\*4270 Recent Philosophical Issues U (3-0) [0.50]**

This course studies primary philosophical texts since 1965. The focus of the course will alternate between analytic texts and issues and continental texts and issues. Texts and topics will vary with the instructor; students are advised to consult the Philosophy department's website: <http://www.uoguelph.ca/philosophy/>.

*Prerequisite(s):* 2.00 credits in Philosophy including 1.00 credits at the 3000 level

**PHIL\*4310 Applied Ethics U (3-0) [0.50]**

An advanced study of specific problems in applied ethics. This is an intensive course designed for philosophy majors as well as for seventh and eighth semester students who have had no previous philosophy course.

**PHIL\*4340 Advanced Ethics U (3-0) [0.50]**

This course offers an advanced study of problems in ethical theory. This course will examine contemporary and perennial issues in ethics through recent or historical texts. Texts and topics will vary with the instructor; students are advised to consult the Philosophy department's website: <http://www.uoguelph.ca/philosophy/>.

*Prerequisite(s):* PHIL\*2120, 1.00 credits in Philosophy at the 3000 level

**PHIL\*4360 Theory of Knowledge II U (3-0) [0.50]**

An examination of central problems concerning the nature of knowledge. In some offerings the selection will emphasize problems in the Philosophy of Language.

*Prerequisite(s):* 2.50 credits in Philosophy or PHIL\*3190

**PHIL\*4370 Metaphysics U (3-0) [0.50]**

An advanced study of problems concerning the nature of reality.

*Prerequisite(s):* 1.00 credits in Philosophy at the 3000 level

**PHIL\*4390 Selected Topics in Philosophy III U (3-0) [0.50]**

Open to honours philosophy students in their 7<sup>th</sup> and 8<sup>th</sup> semesters.

*Prerequisite(s):* 1.00 credits in Philosophy at the 3000 level

**PHIL\*4400 Major Texts in Philosophy U (3-0) [0.50]**

Advanced study of a major text in philosophy not treated in either PHIL\*4410 or PHIL\*4420.

*Prerequisite(s):* 1.00 credits in Philosophy at the 3000 level

**PHIL\*4410 Major Texts in Philosophy U (3-0) [0.50]**

Advanced study of a major text in philosophy not treated in either PHIL\*4400 or PHIL\*4420.

*Prerequisite(s):* 1.00 credits in Philosophy at the 3000 level

**PHIL\*4420 Major Texts in Philosophy U (3-0) [0.50]**

Advanced study of a major text in philosophy not treated in either PHIL\*4400 or PHIL\*4410.

*Prerequisite(s):* 1.00 credits in Philosophy at the 3000 level

**PHIL\*4500 Philosophy Honours Seminar U (3-0) [1.00]**

This research seminar provides philosophy majors with an opportunity to apply the knowledge gained in their previous studies to an in-depth, independent research paper. This course permits deep engagement through time for high-level critical reflection. Students will work closely with the instructor to prepare a conference-style and article-length paper. Topics or themes on offer will vary according to the expertise of the faculty member who leads the seminar; students will develop their focus in consultation with the instructor and through in-class presentations. This seminar is recommended for students who have achieved a minimum 78% average in their philosophy courses.

*Prerequisite(s):* 1.00 credits in Philosophy at the 3000 level

*Restriction(s):* 75% average in all Philosophy course attempts. Registration restricted to Philosophy majors.

**PHIL\*4550 Philosophy Honours Workshop U (3-0) [1.00]**

This course trains upper level students in advanced methods of philosophical analysis. Through a workshop format, students will hone their creative and critical skills. Students will learn to analyze and make use of such methods as phenomenology and dialectics, hermeneutics and deconstruction, analytic philosophy and the use of formal logic in conceptual analysis, as well as other methods (including classical methods in philosophy). Editing and peer-reviewing skills will also be developed. Student projects include long and short written assignments, and various formats of oral presentation. This course is especially recommended for students planning to pursue graduate studies in Philosophy.

*Prerequisite(s):* 1.00 credits in Philosophy at the 3000 level

*Restriction(s):* 75% average in all Philosophy course attempts.

**PHIL\*4710 Directed Reading F,W (3-0) [0.50]**

This course is intended as an intensive course of reading chosen by the student in consultation with the faculty member.

*Prerequisite(s):* 1.00 credits in Philosophy at the 3000-level.

*Restriction(s):* Instructor consent required.

**PHIL\*4720 Directed Reading F,W (3-0) [0.50]**

This course is intended as an intensive course of reading chosen by the student in consultation with the faculty member.

*Prerequisite(s):* 1.00 credits in Philosophy at the 3000-level.

*Restriction(s):* Instructor consent required.

**PHIL\*4800 Honours Philosophy Research Paper I U (3-0) [0.50]**

The preparation of a major research paper under the supervision of a faculty member. Normally open only to 7<sup>th</sup> semester honours philosophy students.

*Prerequisite(s):* 1.00 credits in Philosophy at the 3000 level

*Restriction(s):* Instructor consent required.



## Portuguese

**PORT\*1100 Introductory Portuguese (Brazilian Culture) F (3-0) [0.50]**

This course provides the basics of spoken and written Portuguese for students with no previous studies in the language. The learning context will be present-day Brazilian culture.

*Restriction(s):* Instructor Consent Required.

**PORT\*1110 Intermediate Portuguese (Brazilian Culture) W (3-0) [0.50]**

This course is a continuation of Introductory Portuguese with emphasis on oral work. The learning context will be present-day Brazilian culture.

*Prerequisite(s):* PORT\*1100

*Restriction(s):* Instructor Consent Required.

## Physics

### Department of Physics

#### PHYS\*1000 An Introduction to Mechanics F (3-3) [0.50]

This is a course for physical science students which develops the concepts of mechanics as applied to translational and rotational kinematics and dynamics, equilibrium of rigid bodies, oscillations, gravitation, special relativity, and fluid statics and dynamics. Normally this is part of the two-course unit PHYS\*1000 and PHYS\*1010.

*Prerequisite(s):* (1 of 4U Physics, Grade 12 Physics, PHYS\*1020), 4U or Grade 12 Calculus

*Restriction(s):* PHYS\*1080

#### PHYS\*1010 Introductory Electricity and Magnetism W (3-3) [0.50]

This is a course for physical science students on the phenomena of electromagnetism, waves and introductory quantum physics. Topics include electric charges and fields, electric potential, capacitance, magnetic fields, electric circuits, waves, electromagnetic waves, quantization of light and other aspects of introductory quantum physics. Normally this is part of the two-course unit PHYS\*1000 and PHYS\*1010.

*Prerequisite(s):* (MATH\*1080 or MATH\*1200), (1 of 4U Physics, Grade 12 Physics, PHYS\*1020)

#### PHYS\*1020 Introductory Physics F,W (3-2) [0.50]

This course stresses the fundamental properties of particles and waves, designed for students without 4U Physics or equivalent. Topics include: the motion of particles, force, field, momentum, energy and associated conservation laws; basic interactions between particles; properties of waves. It is expected that students will have completed Grade 11 or 3U Physics and at least 1 4U mathematics credit. This course is intended only for students who require the equivalent of 4U Physics in order to proceed to PHYS\*1000, PHYS\*1010, PHYS\*1070, PHYS\*1080, PHYS\*1130, PHYS\*2040. Students may not take this course for credit if they have passed 4U or OAC Physics (or equivalent). (Also offered through Distance Education format.)

#### PHYS\*1070 Introductory Physics for Life Sciences F,W (3-3) [0.50]

Physics of matter and energy at the macroscopic and microscopic levels, with special emphasis on topics of importance to the biological sciences. Topics include properties of waves, acoustics and hearing, optical systems and vision, quantum nature of radiation and its interaction with biomolecules, electricity, high energy radiation and radioactivity.

*Prerequisite(s):* (1 of 4U Physics, OAC Physics, PHYS\*1020), one 4U or OAC Mathematics course

*Restriction(s):* PHYS\*1130

#### PHYS\*1080 Physics for Life Sciences F,W (3-3) [0.50]

This is a complementary course to PHYS\*1070 or PHYS\*1130 with emphasis on some aspects of classical physics important in the biological and environmental sciences. Topics include mechanics and applications to anatomical problems, fluid statics and dynamics, molecular motion, diffusion, osmosis, and heat.

*Prerequisite(s):* (1 of 4U Physics, Grade 12 Physics, PHYS\*1020), one 4U or Grade 12 Mathematics course

*Restriction(s):* PHYS\*1000

#### PHYS\*1130 Physics with Applications W (3-3) [0.50]

This course is for engineering and environmental science students, and uses some calculus in analytic problem-solving. Topics include simple harmonic motion, waves, acoustics, optics, properties and absorption of electromagnetic radiation, blackbody radiation, solar spectrum and flux, electric field and potential, DC circuits, power transmission, nuclear processes, and radioactivity.

*Prerequisite(s):* (MATH\*1080 or MATH\*1200), (1 of 4U Physics, Grade 12 Physics, PHYS\*1020)

*Restriction(s):* PHYS\*1070

#### PHYS\*1600 Contemporary Astronomy F (3-0) [0.50]

This course is designed for non-science students. Emphasis will be on the interdisciplinary and contemporary aspects of astronomy with the object of providing a perspective of our place in the physical universe. Topics will include the solar system, stars and stellar evolution, pulsars, black holes, quasars and cosmology. Students are encouraged to suggest and participate in discussion on items of special interest. (Also offered through Distance Education format.)

*Restriction(s):* Students with standing in any other 1000 level course credit in physics (except PHYS\*1020, PHYS\*1810) may not use this course for credit. B.Sc. students may not take this course for credit.

#### PHYS\*1810 Physics of Music F (3-0) [0.50]

This course is designed for arts and social science students with an interest or background in music. The fundamentals of vibrations and waves will be introduced and applied to a study of archetypal instruments. The psychoacoustic basis of pitch and loudness will be discussed. Students who have standing in any 1000 level physics course, except PHYS\*1020 or PHYS\*1600, may enrol in this course only if they are completing an honours or general B.A. program in Music. In this case, permission of the instructor is required. (Also listed as MUSC\*1090.) (Offered in even-numbered years.)

*Equate(s):* MUSC\*1090

#### PHYS\*2030 Biophysics of Excitable Cells W (3-1) [0.50]

An intermediate biophysics course with special emphasis on the physical properties of nerve cells and of biological transducers such as the ear and the eye.

*Prerequisite(s):* 1.00 credits in physics (excluding PHYS\*1020, PHYS\*1600, PHYS\*1810)

#### PHYS\*2260 Quantum Physics S,W (3-0) [0.50]

The course investigates and describes the properties of atoms, molecules and nuclei in terms of phenomena of quantum physics. Topics include wave properties of matter, particle properties of electromagnetic radiation, uncertainty principle, operators and eigenvalue equations, elementary angular momentum, spin and elementary quantum mechanics.

*Prerequisite(s):* (1 of MATH\*1000, MATH\*1080, MATH\*1200), (PHYS\*1010 or PHYS\*1070), (MATH\*2150 or MATH\*2160)

*Restriction(s):* NANO\*2100

#### PHYS\*2310 Mechanics I F (4-0) [0.50]

This course continues building the foundation in mechanics begun in the first year and is intended for students proceeding to advanced studies in the physical sciences. Topics include analysis of experimental uncertainties (errors), one, two and three dimensional motion, damped and forced harmonic oscillator, gravitation and orbital motion.

*Prerequisite(s):* (MATH\*1210+ or MATH\*2080), (PHYS\*1000+ or PHYS\*1080) (+ preferred)

*Restriction(s):* PHYS\*2440

#### PHYS\*2320 Mechanics II W (4-0) [0.50]

This course is a continuation of PHYS\*2310. Topics include special relativity, noninertial reference frames, dynamics of systems of particles, and rigid body dynamics.

*Prerequisite(s):* PHYS\*2310

*Restriction(s):* PHYS\*2450

#### PHYS\*2330 Electricity and Magnetism I F (4-0) [0.50]

This course continues building the foundation in electricity and magnetism begun in the first year and is intended for students proceeding to advanced studies in the physical sciences. Topics include vector calculus, electric fields, potential, electric work and energy, Gauss's Law, Poisson's and Laplace's equations, capacitors, D.C. circuits, transients and dielectric materials.

*Prerequisite(s):* (MATH\*1210+ or MATH\*2080), (1 of PHYS\*1010+, PHYS\*1070, PHYS\*1130) (+ preferred)

*Co-requisite(s):* PHYS\*2310

*Restriction(s):* PHYS\*2460

#### PHYS\*2340 Electricity and Magnetism II W (4-0) [0.50]

This course is a continuation of PHYS\*2330. Topics include magnetic forces and fields, the Biot-Savart equation, Ampere's Law, magnetic induction, LRC transients, A.C. circuits and magnetic materials.

*Prerequisite(s):* PHYS\*2330

*Restriction(s):* PHYS\*2470

#### PHYS\*2440 Mechanics I F (3-3) [0.75]

This course and the following one, PHYS\*2450, continue building the foundation in mechanics begun in the first year. These courses are intended for students proceeding to advanced studies in the physical sciences. Topics include analysis of experimental uncertainties (errors), one, two and three dimensional motion, damped and forced harmonic oscillator, gravitation and orbital motion. The laboratory work requires a formal treatment of error analysis, as well as computer programming for data analysis.

*Prerequisite(s):* (1 of MATH\*1210+, MATH\*2080), (PHYS\*1000+ or PHYS\*1080) (+preferred)

#### PHYS\*2450 Mechanics II W (3-3) [0.75]

This course is a continuation of PHYS\*2440. Topics include special relativity, noninertial reference frames, dynamics of systems of particles, and rigid body dynamics.

*Prerequisite(s):* PHYS\*2440

**PHYS\*2460 Electricity and Magnetism I F (3-3) [0.75]**

This course and the following one, PHYS\*2470, continue building the foundation in electricity and magnetism begun in the first year. These two courses are intended for students proceeding to advanced studies in the physical sciences. Topics include vector calculus, electric fields, potential, electric work and energy, Gauss's Law, Poisson's and Laplace's equations, capacitors, D.C. circuits, transients and dielectric materials. The laboratory work requires a formal treatment of error analysis, as well as computer programming for data analysis.

*Prerequisite(s):* (1 of PHYS\*1010+, PHYS\*1070, PHYS\*1130), (MATH\*1210+ or MATH\*2080) (+preferred)

*Co-requisite(s):* PHYS\*2440

**PHYS\*2470 Electricity and Magnetism II W (3-3) [0.75]**

This course is a continuation of PHYS\*2460. Topics include magnetic forces and fields, the Biot-Savart equation, Ampere's Law, magnetic induction, LRC transients, A.C. circuits and magnetic materials, Maxwell's equations and the propagation of electromagnetic waves in vacuum.

*Prerequisite(s):* PHYS\*2460

**PHYS\*2550 Radiation and the Environment F (3-0) [0.50]**

This course reviews radiations which occur in the environment and their effects on materials and living systems. These include x-radiation, ultraviolet, visible, infrared, microwave and radio-frequency emissions; acoustical and ultrasonic radiation; and alpha, beta, and gamma radiation from radioactive material. (Offered in even-numbered years.)

*Prerequisite(s):* (1 of PHYS\*1010, PHYS\*1070, PHYS\*1130), 0.50 credits in mathematics at the 1000 level (excluding MATH\*1050)

**PHYS\*2600 General Astronomy F (3-2) [0.50]**

An introduction to astronomy, this course covers the solar system, the sun, stellar and galactic structure. (Offered in odd-numbered years.)

*Prerequisite(s):* 0.50 credits in physics at the 1000 level (excluding PHYS\*1600, PHYS\*1810), 0.50 credit in mathematics at the 1000 level

**PHYS\*3080 Energy W (3-0) [0.50]**

This course covers energy resources and the production, transmission, interconversion, consumption and waste of energy in the industrial society. Emphasis is placed on environmental impact and human safety. Topics include fossil fuels, nuclear fission and fusion, wind and solar power, the hydrogen economy, and conservation strategies.

*Prerequisite(s):* (PHYS\*1000 or PHYS\*1080), (1 of PHYS\*1010, PHYS\*1070, PHYS\*1130), (1 of MATH\*1000, MATH\*1080, MATH\*1200)

**PHYS\*3100 Electronics F (3-3) [0.75]**

This course consists of an introduction to network analysis, the physics of semiconductors, p-n junctions, transistors and integrated circuits. Other topics include: amplifier properties, signal processing using operational amplifiers, an introduction to digital electronics including counters and registers, as well as circuits to convert analog signals to digital and vice-versa. The laboratory illustrates lecture topics, and a major component consists of techniques to interface a computer to integrated circuits for data acquisition.

*Prerequisite(s):* PHYS\*2340 or PHYS\*2470

**PHYS\*3220 Waves and Optics W (3-0) [0.50]**

This course demonstrates the importance of waves in many areas of physics, with an emphasis on waves in optics. The concept of waves is presented within the framework of the mathematics of periodic functions, with discussions of normal modes in oscillatory systems involving both stationary and propagating modes, and Fourier analyses using both series and integral forms. Examples will emphasize applications involving visible light waves such as polarization, interference and diffraction. In addition, other electromagnetic waves and sound waves will be discussed.

*Prerequisite(s):* PHYS\*2310 or PHYS\*2440

**PHYS\*3230 Quantum Mechanics I F (3-0) [0.50]**

This course consists of a formal treatment of quantum mechanics. Topics include wave packets and free particle motion, the Schrodinger equation, harmonic oscillator, piecewise constant potentials, central forces and angular momentum, and the hydrogen atom.

*Prerequisite(s):* (CHEM\*2070 or PHYS\*2260), MATH\*2160, (MATH\*2170 or MATH\*2270), (PHYS\*2340 or PHYS\*2470)

**PHYS\*3240 Statistical Physics I S,F (3-0) [0.50]**

This course is an introduction to statistical physics including thermodynamics and statistical mechanics of equilibrium phenomena.

*Prerequisite(s):* (1 of PHYS\*2260, PHYS\*2310, PHYS\*2440)

*Co-requisite(s):* MATH\*2200

**PHYS\*3400 Advanced Mechanics W (3-0) [0.50]**

This course covers Lagrangian mechanics and Hamiltonian mechanics. Topics include least action principles, Poisson brackets, Liouville's theorem, Hamilton- Jacobi theory, the transition to quantum mechanics and introduction to non-linear dynamics.

*Prerequisite(s):* (MATH\*2170 or MATH\*2270), (PHYS\*2320 or PHYS\*2450)

**PHYS\*3510 Intermediate Laboratory W (0-6) [0.50]**

This modular course consists of experiments in modern and classical physics. Modules include laboratory instrumentation employing computers, modern physics, waves and optics, molecular physics, biophysics, and solid state physics.

*Prerequisite(s):* [PHYS\*2450 or (NANO\*2100, PHYS\*2320)], PHYS\*3100

**PHYS\*4001 Research in Physics F (0-6) [0.50]**

This course is the first part of the two-semester course PHYS\*4001/2. Refer to PHYS\*4001/2 for the course description.

*Prerequisite(s):* PHYS\*3510

*Restriction(s):* PHYS\*4510 ; Instructor consent required.

**PHYS\*4001/2 Research in Physics F-W (0-6) [1.00]**

This is a two-semester (F-W) course in which students apply their knowledge and skills through independent research of an experimental or theoretical nature within physics. Students will be required to present their results in both oral and written reports. Students must make arrangements with a faculty supervisor and obtain approval of the course co-ordinator before course selection. Approval of the course co-ordinator will only be granted upon receipt of a completed registration form, available from the co-ordinator during the course selection period. This is a two-semester course offered over consecutive semesters. When you select it, you must select PHYS\*4001 in the Fall semester and PHYS\*4002 in the Winter semester. A grade will not be assigned to PHYS\*4001 until PHYS\*4002 has been completed.

*Prerequisite(s):* PHYS\*3510

*Restriction(s):* PHYS\*4510 ; Instructor consent required.

**PHYS\*4002 Research in Physics W (0-6) [0.50]**

This course is the second part of the two-semester course PHYS\*4001/2. Refer to PHYS\*4001/2 for the course description.

*Prerequisite(s):* PHYS\*4001

**PHYS\*4040 Quantum Mechanics II W (3-0) [0.50]**

A second course in quantum mechanics. Topics include spin, linear vector spaces, two-level systems, quantum dynamics, rotations and angular momentum, time dependent perturbation theory, Born approximation.

*Prerequisite(s):* PHYS\*3230

**PHYS\*4120 Atomic and Molecular Physics F (3-0) [0.50]**

The application of quantum theory to atomic and molecular structure, and the interaction between electromagnetic radiation and atoms and simple molecules.

*Prerequisite(s):* PHYS\*3240, PHYS\*4040

**PHYS\*4130 Subatomic Physics W (3-0) [0.50]**

This course surveys the field of subatomic physics from radioactive emanations to conjectured subunits of nucleons. Topics include quark models; strong, electromagnetic and weak interactions; isospin, strangeness, conservation laws and symmetry principles; systematics of nuclear properties, nuclear radioactivity, nuclear models and reactions.

*Prerequisite(s):* PHYS\*3230

**PHYS\*4150 Solid State Physics W (3-0) [0.50]**

Bonding in solids, thermal and electrical properties of solids, energy bands, imperfections in solids, properties of semiconductors and insulators.

*Prerequisite(s):* PHYS\*3220, PHYS\*3230, PHYS\*3240 Recommended: PHYS\*4240

*Co-requisite(s):* PHYS\*4040 (if not taken as a pre-requisite)

**PHYS\*4180 Advanced Electromagnetic Theory F (3-0) [0.50]**

This course covers Maxwell's equation, Lorentz-force law, conservation of charge, and conservation of energy (Poynting's theorem). In addition, the course will discuss potentials, gauge transformations, wave equations, and multipole expansions as well as Green's functions for the Poisson and wave equations. Additional topics include electrostatics and magnetostatics (including boundary-value problems), motion of charged particles in electromagnetic fields, and propagation and generation of electromagnetic waves.

*Prerequisite(s):* (PHYS\*2340 or PHYS\*2470)

**PHYS\*4240 Statistical Physics II F (3-0) [0.50]**

A continuation of PHYS\*3240 including a discussion of the grand canonical distribution, quantum statistics, and transport theory.

*Prerequisite(s):* PHYS\*3230, PHYS\*3240

**PHYS\*4300 Inquiry in Physics W (0-6) [0.50]**

In this course, students will undertake independent study of the scientific literature and learn how to communicate scientific research effectively. Students will prepare seminars and written reports on approved topics drawn from current research initiatives in physics.

*Prerequisite(s):* 7.00 PHYS credits.

**PHYS\*4500 Advanced Physics Laboratory F (0-6) [0.50]**

This is a modular course for students in any physics-related major in which techniques of nuclear, solid state and molecular physics will be studied.

*Prerequisite(s):* [PHYS\*2450 or (NANO\*2100, PHYS\*2320)], (PHYS\*3100 or XSEN\*4110 )

**PHYS\*4540 Molecular Biophysics W (3-0) [0.50]**

Physical methods of determining macromolecular structure: energetics, intramolecular and intermolecular forces, with applications to lamellar structures, information storage, DNA and RNA, recognition and rejection of foreign molecules.

*Prerequisite(s):* 0.50 credits in biochemistry, (CHEM\*3860 or PHYS\*3230)

**PHYS\*4560 Biophysical Methods F (3-0) [0.50]**

An introduction to physical techniques to determine the structure of macromolecules and macromolecular structures of biological interest. The techniques include: differential calorimetry, X-ray and neutron scattering, electron microscopy, Raman and infrared spectroscopy, nuclear magnetic resonance, and electron spin resonance. Applications of these techniques in the study of biological membranes will be emphasized. Students taking this course should already have taken PHYS\*4240 or be taking this course concurrently.

*Prerequisite(s):* PHYS\*3220, PHYS\*4040

*Co-requisite(s):* PHYS\*4240 (if not taken as a prerequisite)

**PHYS\*4910 Advanced Topics in Physics I U (3-0) [0.50]**

The content of this course is determined by the interests of the students. Possible topics include fluid mechanics, theory of elastic solids, general relativity, astrophysics, and chaos. This course is not offered every year.

*Prerequisite(s):* (MATH\*2150 or MATH\*2160), (MATH\*2170 or MATH\*2270), (PHYS\*2320 or PHYS\*2450), (PHYS\*2340 or PHYS\*2470)

**PHYS\*4920 Advanced Topics in Physics II U (3-0) [0.50]**

The content of this course is determined by the interests of the students. Possible topics include fluid mechanics, theory of elastic solids, general relativity, astrophysics, and chaos. This course is not offered every year.

*Prerequisite(s):* (MATH\*2150 or MATH\*2160), (MATH\*2170 or MATH\*2270), (PHYS\*2320 or PHYS\*2450), (PHYS\*2340 or PHYS\*2470)

**PHYS\*4930 Advanced Topics in Physics III U (3-0) [0.50]**

The content of this course is determined by the interests of the students. Possible topics include fluid mechanics, theory of elastic solids, general relativity, astrophysics, and chaos. This course is not offered every year.

*Prerequisite(s):* (MATH\*2150 or MATH\*2160), (MATH\*2170 or MATH\*2270), (PHYS\*2320 or PHYS\*2450), (PHYS\*2340 or PHYS\*2470)

## Physiology

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### *Department of Biomedical Sciences*

*For course listings and descriptions see Biomedical Sciences.*

*Additional course listings may be found in the course descriptions for Veterinary Medicine and Human Kinetics.*

*Students wishing to study Physiology can complete a 3000 level course or course sequence in: ZOO\*3200; or ZOO\*3210; or HK\*3940; or BIOM\*3100 ; and either BIOM\*3110 or BIOM\*3120 . In addition, students can select specialized courses at the 4000 level (preferably at least 2 with labs) offered by the:*

### *Department of Biomedical Sciences:*

BIOM*4020	[0.50]	Physiology of Digestion
BIOM*4030	[0.50]	Endocrine Physiology
BIOM*4041/2	[1.00]	Mammalian Reproductive Biology
BIOM*4050	[0.50]	Biomedical Aspects of Aging

### *School of Human Biology:*

HK*4320	[0.50]	Work Physiology
HK*4460	[0.50]	Regulation of Human Metabolism
HK*4530	[0.50]	Human Cardiovascular Physiology

### *Department of Integrative Biology*

ZOO*4170	[0.50]	Experimental Comparative Animal Physiology
ZOO*4390	[0.50]	Environmental Physiology
ZOO*4470	[0.50]	Comparative Endocrinology

## Plant Biology

*School of Environmental Sciences*

*Department of Plant Agriculture*

### **PBIO\*3110 Crop Physiology F (3-3) [0.50]**

This course examines the physiological basis of crop yield determination, with emphasis on phenomena that express themselves at the whole canopy (rather than single plant) level of organization. It covers canopy scale measurements of crop growth, development, and solar radiation capture; photosynthesis, beginning at the level of biochemistry and working up to the whole canopy scale; how photoassimilates are used in the processes of respiration, growth and yield formation; and crop - environment interactions, including water stress, nutrient uptake and utilization, and light quality effects on photomorphogenesis. Department of Plant Agriculture.

*Prerequisite(s):* 1 of BIOL\*1040, BIOL\*1070, BIOL\*1090

### **PBIO\*3750 Plant Tissue Culture F (2-3) [0.50]**

An examination and discussion of the principles, protocols and utilization of plant cell tissue culture systems. In vitro propagation and regeneration, mutagenesis and selection, secondary metabolite elicitation and cell transformation techniques including protoplast fusion, direct DNA uptake and plant bacterial co-cultivation will be emphasized. Department of Plant Agriculture.

*Prerequisite(s):* AGR\*2451/2 or BOT\*2100

### **PBIO\*4000 Molecular and Cellular Aspects of Plant-Microbe Interactions F (3-0) [0.50]**

This course examines molecular and cellular aspects of the interaction between plants and microorganisms such as mycorrhizae, pathogenic fungi, Agrobacterium, pathogenic bacteria, and plant viruses. Topics include microbial virulence, signaling, gene expression, and disease resistance in plants. School of Environmental Sciences.

*Prerequisite(s):* 1 of BOT\*2100, MICR\*2030, (BIOL\*1070, BIOL\*1090, MBG\*2040)

### **PBIO\*4100 Soil Plant Relationships W (3-0) [0.50]**

Root growth as affected by soil properties; soil plant water relations; soil aeration; absorption, translocation and function of nutrients in plants; ion transport to roots; rhizosphere effects; application of concepts to crop production. School of Environmental Sciences.

*Prerequisite(s):* 1 of AGR\*2301/2, AGR\*2320, BOT\*2100, BOT\*2300, SOIL\*2010, SOIL\*2320

### **PBIO\*4150 Molecular and Cellular Aspects of Plant Development W (3-0) [0.50]**

An examination of the molecular and cellular processes that underlie cellular differentiation and organ formation in plants. The roles of homeotic genes, gene regulation, cell polarity, morphogens and environmental effects in development will be discussed. Subjects will be introduced by a lecture and examined in detail in discussions of pertinent research papers. Department of Plant Agriculture. (Offered in even-numbered years.)

*Prerequisite(s):* BOT\*2100

### **PBIO\*4530 Environmental Pollution Stresses on Plants W (3-0) [0.50]**

This course analyzes the environmental pollution effects on physiological and ecological processes of plants, in both managed and unmanaged ecosystems. Pollutants under study include contaminants of air (such as ozone, sulphur dioxide and UV-B radiation) and soil (such as metals and organic xenobiotics). The format includes both lecture and presentation/discussion of current and historical peer-reviewed literature. School of Environmental Sciences.

*Prerequisite(s):* 2 of BIOL\*2060, (BIOL\*2210 or MCB\*2210), BOT\*2030, BOT\*2050, BOT\*2100, CROP\*2110, ENVB\*2030, ENVB\*2040, ENVM\*1100

### **PBIO\*4750 Genetic Engineering of Plants W (3-3) [0.50]**

This course provides an examination and discussion of the principles, protocols and applications of molecular biology and transformation technology to the genetic improvements of plants. Department of Plant Agriculture.

*Prerequisite(s):* MBG\*2020 or MBG\*2040

## Political Science

### Department of Political Science

For courses without semester designations, please check with the department. Advance schedules are available in the department.

The department works in cooperation with the department of Political Science at the University of Waterloo to offer courses via the video link classroom. These courses are identified by the designation LINK in their course description. Further information can be obtained from the department.

#### **POLS\*1150 Understanding Politics F,W (3-1) [0.50]**

This is the recommended introductory course for students intending to pursue a specialization in Political Science. An introduction to the basic concepts of politics, such as liberty, equality, social justice, constitutionalism, sovereignty, federalism, parliamentary versus presidential government. The course will emphasize the meaning and use of these terms within Canada in the context of other political systems.

*Restriction(s):* POLS\*1000, POLS\*1300

#### **POLS\*1400 Issues in Canadian Politics F (3-1) [0.50]**

Through the lens of contemporary political issues, this course will examine the pillars of the Canadian political system - Parliamentary government, federalism and the Charter of Rights and Freedoms - and how they reflect and affect the distinctly Canadian societal cleavages: linguistic, regional, ethnic, national, and sexual. Students will develop an awareness and understanding of these concepts, institutions and processes, which will enhance their ability to interpret current political events and provide a foundation upon which to explore Canadian politics, identity, public policy and governance in upper level political science courses. (Also offered through Distance Education format.)

#### **POLS\*1500 World Politics F (3-0) [0.50]**

An examination of the fundamental patterns of international politics, focusing especially on the major issues and contemporary events at the root of international conflict. As well, the reality of globalization and interdependence is assessed in terms of the alternative patterns of international cooperation in the contemporary world. (Also offered through Distance Education format.)

#### **POLS\*2000 Political Theory F (3-0) [0.50]**

A study of the philosophic and ideological developments which have led to the emergence of the modern state and contemporary politics.

#### **POLS\*2080 Development and Underdevelopment F (3-0) [0.50]**

An examination of the politics of development, distribution and conflict in Africa, Asia, the Middle East and the Americas from a comparative and international perspective.

#### **POLS\*2100 Comparative Politics W (3-0) [0.50]**

An examination of the evolution, purposes, structures and functions of the state in relation to the economy and civil society.

#### **POLS\*2150 Gender and Politics W (3-0) [0.50]**

This course introduces students to competing approaches to gender and politics. Students will examine the interrelationship of gender, politics and the state, focusing on its implications for political mobilization, representation and participation, public policy, global gender issues in international relations, and cultural and regional differences in gender politics. The course provides the student with the conceptual and analytical tools for upper-year courses on politics in general and on gender, sexuality and politics in particular.

#### **POLS\*2200 International Relations F (3-0) [0.50]**

An introduction to basic theories and concepts in the study of international relations, including an analysis of power, national interest, security, survival, nationalism, sovereignty, decision-making, interdependence, integration, and transnationalism.

#### **POLS\*2250 Public Administration and Governance W (3-0) [0.50]**

The course explores, from both practical and theoretical perspectives, planning and implementation of programs and services through government departments and agencies and “alternative” processes and structures, sometimes involving non-governmental actors. The course critically evaluates the changing role of bureaucracy; financial and human resource management; and the evolving concepts of responsibility and accountability. (Also offered through Distance Education format.)

*Prerequisite(s):* POLS\*1150 or POLS\*1400

#### **POLS\*2300 Canadian Government and Politics F,W (3-0) [0.50]**

This course explores the core institutions of Canadian government, including parliamentary government, federalism, the Charter of Rights and Freedoms and electoral systems. How these institutions shape and are shaped by political parties and social forces, as well as current issues like Quebec nationalism, identity politics and aboriginal governance, are covered. (Also available through Distance Education format.)

#### **POLS\*3000 Politics of Africa U (3-0) [0.50]**

Africa in the 20th Century has been the scene of rapid political and economic change. This course analyzes African politics in the light of contemporary problems of development and modernization.

*Prerequisite(s):* POLS\*2080 or POLS\*2100

#### **POLS\*3050 Canadian Political Parties, Elections and Pressure Groups W (3-0) [0.50]**

The course emphasizes political process rather than governmental structures. Topics to be explored include the role of political parties, pressure groups, the electoral system and voting and their impact on the nature of Canada as a democratic state.

*Prerequisite(s):* POLS\*1400 or POLS\*2300

#### **POLS\*3060 Politics of the Middle East and North Africa U (3-0) [0.50]**

Students will examine the political dynamics of selected states and societies (e.g. Egypt, Syria, Saudi Arabia, Iran, Israel, Jordan and Algeria) in the Middle East and North Africa (MENA). Issues to be covered: the impact of early Middle Eastern/North African history upon today's politics; class structures in the MENA countries and their impact on politics; the rise of Arab nationalism; Zionism; the politics of oil; the status of women; the political impact of economic restructuring; Islamic movements; state-building; and political liberalization and democratization in the Middle East and North Africa.

*Prerequisite(s):* POLS\*2080 or POLS\*2100

#### **POLS\*3080 Politics of Latin America U (3-0) [0.50]**

An exploration of Latin American politics from a multidimensional perspective. It analyzes the interaction among contemporary political structures, ideologies and processes in the context of socio-economic change.

*Prerequisite(s):* POLS\*2080 or POLS\*2100

#### **POLS\*3130 Law, Politics and Judicial Process U (3-0) [0.50]**

This course emphasizes the study of the judicial system as a branch of government and highlights the interaction between the judiciary, law, the political process and public policy. Issues such as judicial selection and Charter of Rights decisions by courts will be explored. Comparisons with the judicial process in other countries will supplement the focus on the Canadian judicial process.

*Prerequisite(s):* 1 of POLS\*1400, POLS\*2250, POLS\*2300

#### **POLS\*3160 Women and Politics in the Third World U (3-0) [0.50]**

The purpose of this course is twofold: 1) to examine Western analyses and assumptions concerning women and politics in the Third World; and 2) to examine how women's activities in the Third World challenge our definitions and understanding of power, political participation, and empowerment.

*Prerequisite(s):* POLS\*2080 or POLS\*2100

#### **POLS\*3180 Research Methods I: Political Inquiry and Methods F (2-1) [0.50]**

Students will be introduced to some of the major paradigms of political science research that shape inquiry into political and social phenomena. Students will learn how to: define research problems and construct questions for political inquiry; develop theory to explain, predict or interpret the political world; and formulate research designs. A variety of quantitative and qualitative methods will be explored.

*Prerequisite(s):* 5.00 credits including (2 of POLS\*2080, POLS\*2100, POLS\*2200, POLS\*2250)

#### **POLS\*3210 The Constitution and Canadian Federalism W (3-0) [0.50]**

Canada's constitution and its federal system lie at the heart of the ongoing crisis facing the Canadian Confederation. This course examines the major features of our constitutional development, how the current system of intergovernmental relations has evolved, and the challenges posed by Canada's cultural diversity, pressures for decentralisation, and the maintenance of national sovereignty.

*Prerequisite(s):* POLS\*2300

#### **POLS\*3230 Modern Political Thought W (3-0) [0.50]**

This course explores the impact of modern science and technology, and its impact on the western tradition of justice from the seventeenth century to the twentieth century. It will explore this theme in writers such as Thomas Hobbes, Jonathan Swift, J-J Rousseau, Edmund Burke, Friedrich Nietzsche and George Grant. The exact selection of thinkers will vary from year to year and students are advised to check the course outline.

*Prerequisite(s):* POLS\*2000 or POLS\*3280

*Restriction(s):* POLS\*3021

#### **POLS\*3250 Public Policy: Challenges and Prospects F (3-0) [0.50]**

This course covers the dominant theories that explain the origins and character of public policy in Canada, and other countries. The focus will be on both governmental and nongovernmental actors.

*Prerequisite(s):* POLS\*1400 or POLS\*2250

**POLS\*3270 Local Government in Ontario U (3-0) [0.50]**

Municipal governments are major spenders of public funds in Canada, and are also the level of government closest to the people. In this course, students will examine the major problems confronting urban government in Ontario.

*Prerequisite(s):* 7.50 credits

**POLS\*3300 Governing Criminal Justice U (3-0) [0.50]**

The course provides an overview of the policy process and outcomes of the Canadian criminal justice system. Particular emphasis is placed on examining, using various public policy and public management perspectives, the practices and interactions of governmental agencies within the system, such as police agencies and boards, departments of Justice, Solicitor-General, corrections and parole agencies, courts and the legal profession.

*Prerequisite(s):* POLS\*2250 or POLS\*2300

*Restriction(s):* This is a Priority Access course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the departmental website for more information.

**POLS\*3320 Politics of Aid & Development F (3-0) [0.50]**

This course examines the motivations and mechanisms by which industrialized states have designed and implemented foreign aid programs and policy, primarily since the end of the Second World War. Particular emphasis will be placed on the role of multilateral, bilateral and nongovernmental organizations in the delivery of development assistance and humanitarian relief.

*Prerequisite(s):* POLS\*2080

**POLS\*3370 Environmental Politics and Governance S,F (3-0) [0.50]**

This course examines environmental politics and governance in Canada as well as in comparative and international contexts. This is accomplished by surveying how various political, legal, administrative, and private-public actors and processes influence the development and implementation of environmental policy. (Also offered through Distance Education format.)

*Prerequisite(s):* 7.50 credits

**POLS\*3410 U.S. Politics and Government U (3-0) [0.50]**

This course involves a treatment of the basic principles and institutions of national government and politics in the United States as well as the making and execution of public policy at the national and state levels.

*Prerequisite(s):* POLS\*2100 or POLS\*2300

**POLS\*3440 Corruption, Scandal and Political Ethics U (3-0) [0.50]**

This course will introduce students to the phenomenon of political corruption and the study of its incidence. Attention will be paid to historical examples, contemporary scandals, and analytical articles, dealing with the nature, causes and effects, and proposed cures of political corruption, and the ethical dilemmas inherent in political life.

*Prerequisite(s):* 5.00 credits

**POLS\*3450 European Governments and Politics U (3-0) [0.50]**

Europe has forged a new form of political organization, the European Union, in addition to its variety of national democratic forms. This course offers a comparative examination of selected national governments, as well as an exploration of this new supra-national organization.

*Prerequisite(s):* POLS\*2100 or POLS\*2200

**POLS\*3470 Business-Government Relations in Canada U (3-0) [0.50]**

The public and private sectors in Canada have become more and more interrelated in recent years as evidenced by tax and expenditure policies, the role of regulation and public enterprise, and the increasing emphasis on consultation and co-ordination. This course examines the evolving relationship between governments and the private sector in Canada, including business (both large and small), organized labour, specific sectors such as agriculture and consumer affairs and voluntary organizations.

*Prerequisite(s):* POLS\*1400 or POLS\*2250

**POLS\*3490 Conflict and Conflict Resolution F (3-0) [0.50]**

This course will examine the growing body of literature which considers violent conflict and its management. Materials are organized to reflect the trajectory of many contemporary conflicts: from explanations for violence, to identifying conditions and means to resolve conflict and, finally, to post-conflict governance.

*Prerequisite(s):* POLS\*1500 or POLS\*2200

*Restriction(s):* This is a Priority Access course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the departmental website for more information.

**POLS\*3650 Research Methods II: Quantitative Methods W (2-1) [0.50]**

This course examines quantitative research methods used in political science, primarily sampling and surveying techniques, in combination with elementary statistical analysis. Students learn how to apply basic descriptive and inferential statistical procedures to research political problems and test hypotheses. In lab, students will acquire the skills to perform data analysis

*Prerequisite(s):* POLS\*3180 or SOAN\*2120

*Restriction(s):* Registration in Criminal Justice & Public Policy or Political Science (major, minor or area of concentration) or International Development (major only).

**POLS\*3670 Comparative Public Policy and Administration W (3-0) [0.50]**

This course examines the role of the bureaucracy in national development in various economic, social and political environments. The focus of the course is the interplay between bureaucracy, democracy and development in a comparative perspective.

*Prerequisite(s):* 1 of IDEV\*2010, IDEV\*2500, POLS\*2080, POLS\*2100, POLS\*2250

**POLS\*3710 Politics and Sexuality U (3-0) [0.50]**

Sexuality is treated as a subject for political theory from a number of critical and interdisciplinary perspectives. The course examines the relationship between sexuality and politics by analyzing the dynamics of power in the context of sexuality.

*Prerequisite(s):* POLS\*2000 or PHIL\*2060

**POLS\*3790 The Political Economy of International Relations W (3-0) [0.50]**

This course examines major features of the contemporary international political economy, treating major theories and concepts within this approach to international relations (hegemony, globalization, interdependence, world systems theory, etc.) and focusing on the operation of key international institutions and regimes (i.e. communications, trade and transport policy).

*Prerequisite(s):* 1 of IDEV\*2010, IDEV\*2500, POLS\*2080, POLS\*2100, POLS\*2200

**POLS\*3850 Experiential Learning in Political Science U (3-0) [0.50]**

This course allows students to reflect upon their involvement in some form of politically related activity, including simulations, volunteer programs, or internship work with government or non-government organizations. The student must find a faculty member from the Department of Political Science willing to act as a supervisor for the course. See the Political Science website for the learning contract and other requirements that must be completed in advance of registering for this course.

*Prerequisite(s):* Minimum of 10.00 credits, 2.00 of which must be in Political Science.

*Restriction(s):* Approval of the experience and evaluation criteria by the Undergraduate Committee of the Department of Political Science; Instructor consent required.

**POLS\*3890 Government and Politics of India W (3-0) [0.50]**

The course is designed to provide a survey of the history, society, culture, politics, government, bureaucracy and foreign relations of India.

*Prerequisite(s):* 1 of POLS\*2080, POLS\*2100, POLS\*2200

**POLS\*3920 Modern China F (3-0) [0.50]**

This course is a detailed study of the political history of modern China and its current politics. The main objective is to assess the extent to which the Chinese Communist Party has fulfilled its mandate, which is to build a sovereign and united China as well as to modernize the country within a socialist framework.

*Prerequisite(s):* 1 of POLS\*2080, POLS\*2100, POLS\*2200

**POLS\*3960 Selected Topics in Political Science S,F,W (3-0) [0.50]**

Readings and research in selected areas of the discipline not covered by regular course offerings. Students present a proposal and seek approval from a member of the department in the semester previous to enrolment in this course. The method of course presentation, emphasis, and evaluation are at the discretion of the instructor.

*Prerequisite(s):* 1.50 credits at the 3000 level in Political Science or equivalent

*Restriction(s):* Instructor consent required.

**POLS\*4030 Contemporary Political Theory U (3-0) [0.50]**

This course provides an analysis of selected theories and political issues discussed by prominent 20th-Century thinkers. These contemporary works will be examined as part of the long tradition of political discourse dating back to the classical period.

*Prerequisite(s):* POLS\*2000 and at least 1.00 credits at the 3000 level in the Political Thought stream.

*Restriction(s):* This is a Priority Access course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the departmental website for more information.



**POLS\*4050 Advanced Topics in Law and Politics U (3-0) [0.50]**

This course explores advanced topics in law and politics depending on the interests of the instructor. Potential topics include investigating the law and politics of social change or analyzing debates about the political power of courts in Canada or in comparative perspectives.

*Prerequisite(s):* 1.00 credits at the 3000-level in the Law, Policy and Governance stream or the Comparative Politics stream. POLS\*3130 recommended.

*Restriction(s):* This is a Priority Access course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the departmental website for more information.

**POLS\*4100 Women, Justice and Public Policy U (3-0) [0.50]**

This course will use gender-based analysis in examining a series of justice and public policy issues affecting the lives of women, including equality rights, pay and employment equity, domestic violence, sexual assault, family policy, health care policy, and pornography. How do current policies that developed out of neoliberalism influence the lives of women in different ways than men? How can/should they be changed to recognize the different life experiences of women as distinguished from men? The primary focus of the topics covered in this course will be Canadian, although the experiences in other countries will be covered, particularly as it relates to "best practices," where appropriate.

*Prerequisite(s):* 2 of POLS\*2250, POLS\*2300, POLS\*3250 and 1.00 credits in the Public Policy, Governance and Law or Canadian Politics.

*Restriction(s):* This is a Priority Access course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the departmental website for more information.

**POLS\*4140 Conceptions of Canada W (3-0) [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.

*Prerequisite(s):* POLS\*2300 and 1.00 credits at the 3000 level in the Canadian Politics stream.

*Restriction(s):* This is a Priority Access course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the departmental website for more information.

**POLS\*4160 Multi-Level Governance in Canada U (3-0) [0.50]**

This course considers the evolving relationship among levels of government in Canada. The growth of cities, the growth of policy responsibilities of provinces, the influence of international organizations, and the development of First Nations government in Canada all challenge the conventional study of federal-provincial relations in Canada. From year to year, this course examines one or several of these contemporary dynamics.

*Prerequisite(s):* POLS\*2300 and 1.00 credits at the 3000 level in the Canadian Politics stream.

*Restriction(s):* This is a Priority Access course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the departmental website for more information.

**POLS\*4200 International Political Economy U (3-0) [0.50]**

The course relies on theoretical approaches in IPE to examine relationships between politics and economics across national and regional levels. The evolution of the global political economy and its governance structures is explored, as well as contemporary debates about globalization and state and non-state actors' responses. Issue-areas may include: money and power, technology, trade, development and the environment.

*Prerequisite(s):* (1 of POLS\*2080, POLS\*2100, POLS\*2200); and at least 1.00 credits at the 3000 level in the International Relations and Global Studies stream.

*Restriction(s):* This is a Priority Access course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the departmental website for more information.

**POLS\*4250 Topics in Public Management W (3-0) [0.50]**

This course will examine various topics related to governance, such as public management reform, public sector leadership, third sector organizations or budgeting and human resources.

*Prerequisite(s):* POLS\*2250 and 1.00 credits at the 3000 level in the Public Policy, Governance and Law stream or the Canadian Politics stream.

*Restriction(s):* This is a Priority Access course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the departmental website for more information.

**POLS\*4260 Topics in Public Policy U (3-0) [0.50]**

This course will examine various public policy issues such as social policy or health care policy in a Canadian or comparative context.

*Prerequisite(s):* (2 of POLS\*2250, POLS\*2300, POLS\*3250), 1.00 credits in the Public Policy, Governance and Law stream or the Canadian Politics stream.

*Restriction(s):* This is a Priority Access course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the departmental website for more information.

**POLS\*4300 Human Rights, Ethics, and Development W (3-0) [0.50]**

This course is intended to address the ethical issues that arise from development processes and studies by focusing on human rights. The subject is explored from a range of philosophical, religious, and cultural perspectives, including both Western and non-Western. Related themes include global and social justice; nationalism, cosmopolitanism, and multiculturalism.

*Prerequisite(s):* (POLS\*2000 and 1.00 credits in the Political Thought stream) or (POLS\*2000 and 0.50 credits in Political Thought stream and 0.50 credits in the Comparative Politics stream.)

*Restriction(s):* This is a Priority Access course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the departmental website for more information.

**POLS\*4340 Nationalism, State-building and Identity U (3-0) [0.50]**

The course examines the role of nationalism in contemporary politics. Nationalism as such is understood as a major political force in state-building. Its impact on both global and national politics is assessed in relation to other forms of identity-based politics.

*Prerequisite(s):* (1 of POLS\*2000, POLS\*2100, POLS\*2200), (1.0 credits at the 3000 level in the Comparative Politics stream or 1.00 credits at the 3000 level in the International Relations and Global Studies stream).

**POLS\*4710 Topics in Comparative Politics U (3-0) [0.50]**

This course considers theories and problems in comparative politics and government in developing and industrialized countries. The geographical and theoretical focus of the course will reflect the interests of the instructor.

*Prerequisite(s):* (POLS\*2080 or POLS\*2100) and 1.00 credits at the 3000 level in the Comparative Politics stream.

*Restriction(s):* This is a Priority Access course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the departmental website for more information.

**POLS\*4720 Topics in International Relations U (3-0) [0.50]**

This course considers theories and problems in the field of International Relations. The theoretical and/or geographical focus of the course will reflect the interests of the instructor.

*Prerequisite(s):* POLS\*2200 and 1.00 credits at the 3000 level in the International Relations and Global Studies stream.

*Restriction(s):* This is a Priority Access course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the departmental website for more information.

**POLS\*4740 Advanced Topics in Rights and Liberties F (3-0) [0.50]**

The course explores rights and liberties from various perspectives depending on the interests of the instructor. Potential topics include exploring the political, social, and legal factors and theories that explain the development of rights and liberties; rights and liberties in a comparative and international context; or the philosophical and policy debates surrounding rights and liberties.

*Prerequisite(s):* (POLS\*3130 or POLS\*3210) and at least 1.00 credits at the 3000 level in the Public Policy, Governance and Law stream.

*Restriction(s):* This is a Priority Access course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the departmental website for more information.

**POLS\*4910 Selected Topics in Political Science II S,F,W (3-0) [0.50]**

This course provides for independent reading and research in selected areas of the discipline not covered by regular course offerings. Prior to enrollment in the course, approval must be obtained from a member of the department willing to supervise the research. Students should approach potential supervisors with a proposal for readings and research, which may include reflection and expansion on a subject matter addressed in previous course assignments.

*Prerequisite(s):* 1.50 credits at the 3000 level in Political Science or equivalent

*Restriction(s):* Instructor consent required.

**POLS\*4930 Selected Topics in Political Science II S,F,W (3-0) [0.50]**

This course provides for independent reading and research in selected areas of the discipline not covered by regular course offerings. Prior to enrollment in the course, approval must be obtained from a member of the department willing to supervise the research. Students should approach potential supervisors with a proposal for readings and research, which may include reflection and expansion on a subject matter addressed in previous course assignments.

*Prerequisite(s):* 1.50 credits at the 3000 level in Political Science or equivalent

*Restriction(s):* Instructor consent required.

**POLS\*4970 Honours Political Science Research I S,F,W (3-0) [0.50]**

This is Part I of the Honours Essay. Students complete the necessary reading and research for their Honours Essay under the supervision of a department advisor. A research proposal is expected by the end of the semester. Political science majors who wish to pursue an honours thesis must register in this course in their 7th semester. Student selection of an approved subject area and instructor must be completed in the semester previous to enrolment in this course.

*Prerequisite(s):* 70% average in all POLS courses. Recommendation: Students with less than a 75% average are advised not to take this course.

*Restriction(s):* Instructor consent required.

**POLS\*4980 Honours Political Science Research II S,F,W (3-0) [0.50]**

This is Part II of the Honours Essay. Students organize and write their essays under the supervision of their advisor. Major honours political science students must register in this course in their 8th semester.

*Prerequisite(s):* POLS\*4970

*Restriction(s):* Instructor consent required.

## Population Medicine

*Department of Population Medicine*

### **POPM\*3240 Epidemiology F (3-0) [0.50]**

The course examines the basic concepts of health and disease in populations. Methods used in descriptive and analytic epidemiological studies, including the design, analysis and interpretation of results for observational studies and field trials are presented.

*Prerequisite(s):* (1 of BIOL\*1040, BIOL\*1080, BIOL\*1090), STAT\*2040

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods. Please see the Department of Population Medicine website for more information.

### **POPM\*4040 Epidemiology of Food-borne Diseases F (3-0) [0.50]**

This course examines the epidemiology and prevention of food-borne infections and intoxications, including those of both microbiological and chemical origin. Drawing on outbreak investigations, surveys, risk assessments, government surveillance systems and basic research, the biological, ecological, socio-economic and public health context of these diseases will be discussed.

*Prerequisite(s):* 1 of FOOD\*3230, POPM\*3240

*Restriction(s):* FOOD\*4210

### **POPM\*4230 Animal Health F (3-0) [0.50]**

This course examines the causes and effects of important diseases of food animals in Canada, with a focus on dairy cattle. Elements of physiology, epidemiology, microbiology, nutrition, and production management are integrated into a health management approach emphasizing disease prevention. The course is directed at senior undergraduate students with interest in and knowledge of, food animal production agriculture. (Offered in even-numbered years)

*Prerequisite(s):* ANSC\*2340 or ANSC\*3080

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods. Please see the Department of Population Medicine web site for more information.

## Psychology

### Department of Psychology

*Students wishing to take a 2000, 3000 or 4000 level course without having completed the appropriate prerequisites must receive permission of the instructor who will determine whether the student has the required background for the course. Students in all psychology courses will be encouraged to participate in the on-going research of the department.*

**Honours Courses::** courses designated with (H) are designed for students in a psychology honours specialization. This includes B.A. Honours Psychology (PYSC) major or minor, B.A. Information Systems and Human Behaviour (ISHB) major, B.Sc. Psychology: Brain and Cognition (PBC), major or minor, and the Neuroscience (NEUR) minor. (H) courses are Honours level requiring for registration a cumulative average of at least 70% in all course attempts in Psychology or registration in the ISHB major, NEUR minor, or PBC major or minor. Unless otherwise specified, all other courses may be taken by students in a general or honours program, providing the prerequisites are met.

*Psychology Core: courses marked (C) are Psychology core courses. Students registered in psychology programs are advised to complete at least 2.00 credits of the psychology core at the 2000 level prior to attempting any 3000 level psychology credit.*

*For courses without semester designations, please check with the department. The remaining courses will normally be offered as indicated. Advance schedules are available in the department.*

#### **PSYC\*1100 Principles of Behaviour S,F,W (3-0) [0.50]**

This is an introduction to the study of biopsychology, sensory processes, perception, learning, memory, thought, language, consciousness and motivation. (Also offered through distance education format.)

#### **PSYC\*1200 Dynamics of Behaviour S,F,W (3-0) [0.50]**

This is an introduction to the study of human development, intelligence, personality, psychopathology and its treatment and social psychology. (Also offered through distance education format.)

#### **PSYC\*2010 Quantification in Psychology S,F,W (3-0) [0.50]**

An introduction to psychological measurement and to statistical principles in psychological research. The course emphasizes descriptive statistics and introduces concepts and techniques of hypothesis testing. Cannot be taken for credit by students with credit in a 2000 level or above course in statistics. (Also offered through distance education format.)

*Prerequisite(s):* PSYC\*1100 or PSYC\*1200

#### **PSYC\*2040 Research Statistics F,W (2-2) [0.50]**

This course emphasizes inferential tests applied to psychological research, skills of data analysis, as well as the use and interpretation of output from statistical software. Topics covered include the t-test, various forms of analysis of variance, chi-square, bivariate and multiple regression, as well as multivariate data analysis.

*Prerequisite(s):* PSYC\*2010 or STAT\*2040

*Restriction(s):* PSYC\*3320

#### **PSYC\*2310 Introduction to Social Psychology S,F,W (3-0) [0.50]**

The content and research methods of social psychology will be explored in lectures and seminars. Content includes social perception, attraction, group dynamics, leadership, conflict and cooperation, attitude change, aggression and conformity. (Also offered through distance education format.) (C)

*Prerequisite(s):* PSYC\*1200

#### **PSYC\*2330 Principles of Learning F,W (3-0) [0.50]**

This course is an introduction to the basic principles and concepts of classical and instrumental conditioning paradigms of learning. (C)

*Prerequisite(s):* PSYC\*1100, PSYC\*1200

#### **PSYC\*2360 Introductory Research Methods S,F,W (3-0) [0.50]**

The application of scientific method in psychological experiments with laboratory demonstration. (Also offered through distance education format.)

*Prerequisite(s):* PSYC\*1100, PSYC\*1200, (PSYC\*2010 or STAT\*2040)

#### **PSYC\*2390 Principles of Sensation and Perception F,W (3-0) [0.50]**

The course objective is to consider the processes of sensory inputs and perception. Approaches ranging from psychophysiology and cognitive psychology to physiology and anatomy will be used. In considering the psychology of sensation and perception, some of the anatomical and physiological aspects of selected senses will be covered in detail and the roles of experience, organization of inputs, and theories of perception are discussed. Topics to be emphasized will vary with the instructor, but may include ontogenetic development, learning, and modification of inputs and their perception. Students will participate in on-line laboratory demonstrations and experiments. (Also offered through distance education format.) (C)

*Prerequisite(s):* PSYC\*1100

#### **PSYC\*2410 Behavioural Neuroscience I F,W (3-2) [0.50]**

A general introduction to the structure and function of the nervous system. The physiological basis of sensory (input) systems and the motor (output) system are examined as are central physiological bases of processes such as arousal and emotion. Laboratory demonstrations and exercises may be included. (C)

*Prerequisite(s):* PSYC\*1100

#### **PSYC\*2450 Introduction to Developmental Psychology F,W (3-0) [0.50]**

An introduction to and an analysis of the major theories of developmental psychology. Emphasis will be placed on the processes of development in the child including physical growth, perception, cognition, personality and interactions with the social environment. The application of developmental psychology to educational and social issues will be discussed. (Also offered through distance education format.) (C)

*Prerequisite(s):* PSYC\*1100, PSYC\*1200

*Restriction(s):* FRHD\*2270

#### **PSYC\*2650 Cognitive Psychology F,W (3-0) [0.50]**

This course is an introduction to cognitive processes, including topics in the areas of attention, memory, language and reasoning. Students will be exposed to and participate in on-line laboratory demonstrations and experiments. (Also offered through distance education format.) (C)

*Prerequisite(s):* PSYC\*1100

#### **PSYC\*2740 Personality S,F,W (3-0) [0.50]**

A review of the theory, assessment procedures and research findings pertinent to major personality constructs. Personality research, methodology and design will also be covered. (Also offered through distance education format.) (C)

*Prerequisite(s):* PSYC\*1100, PSYC\*1200

#### **PSYC\*3020 Psychology of Law U (3-0) [0.50]**

An examination of psychological methods, findings and theories in the study of law. Topics will include the fallibility of the eyewitness; juror decisional processes; credibility of witnesses and attorneys; socialization into legal systems, police behaviour, etc. (Also offered through distance education format.)

*Prerequisite(s):* PSYC\*2310 (also see psychology core statement)

#### **PSYC\*3030 Neurochemical Basis of Behaviour U (3-0) [0.50]**

An analysis of how drugs act on various neurochemical systems to regulate motivation and behaviour. Topics of discussion may include psychopathology and its treatment.

*Prerequisite(s):* PSYC\*1100, (BIOM\*3090 or PSYC\*2410) (also see psychology core statement)

#### **PSYC\*3070 Psychology in Human Resource Management U (3-0) [0.50]**

This course explores the application of psychological theory and measurement in human resources management. A dual perspective is taken: that of the worker impacted by these practices and that of the manager responsible for implementing them. Specific topics include recruitment, personnel selection, performance management, training, and executive assessment, development, and succession. (Also offered through distance education format.)

*Prerequisite(s):* PSYC\*1200, PSYC\*2310 (also see psychology core statement).

*Restriction(s):* (BUS\*3000 or HTM\*3000)

#### **PSYC\*3080 Organizational Psychology F,W (3-0) [0.50]**

An examination of current theories and practices in organizational psychology. Selected topics may include motivation, turnover, absenteeism, leadership, job design, work attitudes, organizational justice, and organizational development and change. (Also offered through distance education format.)

*Prerequisite(s):* PSYC\*2310 (also see psychology core statement).

*Restriction(s):* HTM\*2200

#### **PSYC\*3100 Evolutionary Psychology U (3-0) [0.50]**

Evolutionary Psychology (EP) offers a Darwinian frame of reference for studying questions about human nature. After reviewing basic material on genetics and natural selection, we will examine and criticize the contribution of EP to the understanding of the various aspects of individual and social behaviour, such as altruism, logic, mate selection, health, morality, aesthetics, and the role of culture.

*Prerequisite(s):* PSYC\*2360 (also see psychology core statement)

#### **PSYC\*3110 Topics in Health Psychology U (3-0) [0.50]**

This course covers research in health psychology. Possible topics include the interplay of psychosocial factors, behaviour, and physical health; pediatric health psychology; health interventions at the individual, family, group or community levels.

*Prerequisite(s):* PSYC\*2310, PSYC\*2450 (also see psychology core statement)

**PSYC\*3250 Psychological Measurement U (3-0) [0.50]**

This course is an introduction to the theory of psychological measurement and measurement procedures presently used in psychology. Coverage will include such topics as reliability, validity, test construction; and the measurement of ability, personality, attitudes, interest and achievement. (Also offered through distance education format.) (H)

*Prerequisite(s):* PSYC\*2010 or STAT\*2040 (also see psychology core statement)

**PSYC\*3280 Minds, Brains & Machines F (3-0) [0.50]**

This course will introduce the student to basic issues in cognitive science from philosophical and psychological perspectives. Connectionism, Turing Machines, artificial intelligence, and alternative naturalistic models of the mind will be among the topics explored.

*Prerequisite(s):* 1.50 credits in Psychology or 1.50 credits in Philosophy

**PSYC\*3300 The Psychology of Gender U (3-0) [0.50]**

This course will examine the theories and psychological research that deals with the impact of gender upon people's lives and behaviour. Topics will include gender-role socialization and stereotypes; gender-related status and power differentials; and gender differences and dynamics in the physiological, intrapsychic, interpersonal, and socio-cultural domains.

*Prerequisite(s):* PSYC\*1200 and at least 1.00 credits of the psychology core (also see psychology core statement)

**PSYC\*3310 Applied Social Psychology U (3-0) [0.50]**

A number of applied issues will be examined from a social psychological perspective. These may include aggression, prejudice, helping, mental illness, crime and addiction. The format will consist of reading, discussion and research/field projects.

*Prerequisite(s):* PSYC\*2310 (also see psychology core statement)

**PSYC\*3330 Memory U (3-0) [0.50]**

This course is an examination of theoretical and empirical studies of the psychological nature of the acquisition, storage and retrieval of information. Students will be exposed to and participate in on-line laboratory demonstrations and experiments.

*Prerequisite(s):* PSYC\*2650 (also see psychology core statement)

**PSYC\*3340 Psycholinguistics U (3-0) [0.50]**

An introduction to the conceptions of the structure of language as they relate to processes underlying the acquisition, production, perception and understanding of speech, and to empirical studies that bear on these conceptions.

*Prerequisite(s):* LING\*1000 or PSYC\*2650 (also see psychology core statement)

**PSYC\*3350 Cross-Cultural Psychology F (3-0) [0.50]**

This course provides an examination of cultural differences from the perspective of psychology, and of individual and group relations within and between culturally diverse societies. The primary goal of this course is to provide a framework and knowledge base with which to understand the various contexts, processes and outcomes of intercultural contact.

*Prerequisite(s):* 9.50 credits including PSYC\*2310

**PSYC\*3370 Experimental Design and Analysis F (3-1) [0.50]**

This course is intended for students planning to complete PSYC\*4870 and PSYC\*4880 in preparation for graduate studies in Psychology. This course emphasizes (1) the model comparison approach to analysis of variance and (2) effective scientific communication. Issues related to design choice, power, multiple-comparisons and categorical data analysis will be reviewed. Laboratory exercises will include SPSS applications and research projects. (H)

*Prerequisite(s):* PSYC\*2360, (1 of PSYC\*2040, PSYC\*3320 or STAT\*2050)

*Restriction(s):* PSYC\*3371/2 . A minimum grade point average of 75% in Psychology courses.

**PSYC\*3380 Non-experimental Research Methods W (3-0) [0.50]**

This course is intended for students planning to complete PSYC\*4870 and PSYC\*4880 in preparation for graduate studies in Psychology. This course addresses issues related to the internal and external validity of quasi-experimental, correlation and other non-experimental research methods, survey sampling and the development and refinement of survey questions. Course work includes SPSS applications, research projects and style of effective scientific communication. (H)

*Prerequisite(s):* PSYC\*2360, (1 of PSYC\*2040, PSYC\*3320 or STAT\*2050)

*Restriction(s):* PSYC\*3371/2 . A minimum grade point average of 75% in Psychology courses.

**PSYC\*3390 Abnormal Psychology U (3-0) [0.50]**

Current theory and research in the field of abnormal psychology will be examined in terms of various models (biological, behavioral, social and psychodynamic). Selected topics may include: stress and anxiety, affective disorders, schizophrenia, psychophysiological and personality disorders, and mental health. (Also offered through distance education format.)

*Prerequisite(s):* PSYC\*2740 (also see psychology core statement)

**PSYC\*3410 Behavioural Neuroscience II U (3-0) [0.50]**

This course will focus on contemporary research and theory related to such selected topics as physiological correlates of memory, learning, motivation, emotion, stress, sensory and motor functions. Both the central and peripheral components of the nervous system will be examined in relation to the above.

*Prerequisite(s):* PSYC\*2410 (also see psychology core statement)

**PSYC\*3440 Cognitive Development U (3-0) [0.50]**

An examination of theory and research pertaining to children's intellectual development. Topics include children's learning and the development of perception, memory, thinking and language.

*Prerequisite(s):* FRHD\*2270 or PSYC\*2450 (also see psychology core statement)

**PSYC\*3450 Social and Personality Development U (3-0) [0.50]**

An examination of research, methodological issues and theories concerning personality-social development. Topics may include temperament, imitation, parent-child interaction, and the development of attachments, sex-roles, morality, aggression and pro-social behaviour.

*Prerequisite(s):* FRHD\*2270 or PSYC\*2450 (also see psychology core statement)

**PSYC\*3460 Abnormal Development U (3-0) [0.50]**

Theory, research and aspects of current practice concerning abnormal psychological development in childhood and adolescence.

*Prerequisite(s):* PSYC\*3440 or PSYC\*3450 (also see psychology core statement)

**PSYC\*3480 Psychology of Sport U (3-0) [0.50]**

An examination of individual and group behaviour in physical activities and sports. Emphasis will be placed on understanding psychological concepts which are pertinent to sports, e.g., motivation, social and personality development, cognition, leadership and group dynamics.

*Prerequisite(s):* PSYC\*1100, PSYC\*1200, (PSYC\*2310 or PSYC\*2740) (also see psychology core statement)

**PSYC\*3570 The Psychology of Death and Dying U (3-0) [0.50]**

An examination of theory, research, and issues in the psychology of death and dying. Emphasis is upon the cognitive operations used to process information about death and the influence of death constructs in daily life. Topics include the development of death concepts throughout the life-span, death anxiety in society, the needs of the dying person, the psychology of grieving, and unexpected losses such as deaths by suicide or miscarriage. (Offered through distance education format only.)

*Prerequisite(s):* 1 of PSYC\*2310, PSYC\*2740, PSYC\*2450, work experience in related fields, instructor consent (also see psychology core statement)

**PSYC\*3660 Contemporary Psychology U (3-0) [0.50]**

Some current developments in psychology. Topics will vary with the interests of faculty members assigned to the course and will be announced prior to the course selection period.

*Prerequisite(s):* previous study related to the topic area (also see psychology core statement)

**PSYC\*3690 Community Mental Health U (3-0) [0.50]**

This course is an introduction to the principles and practices of community mental health and community psychology. The course deals with the application of public health concepts to the field of mental health, the epidemiology of mental disorder in the community, the design and evaluation of preventive programs for populations at risk of illness, and the creation of alternatives to institutional treatment of the mentally ill. This course should be of special interest to students who are planning to pursue careers in such human service fields as social work and occupational therapy.

*Prerequisite(s):* PSYC\*2310 (also see psychology core statement)

**PSYC\*3710 Psychology of Learning Difficulties and Disabilities I F (3-0) [0.50]**

An examination of current theories regarding learning difficulties and disabilities in educational settings. Emphasis will be placed on cognitive, social and motivational factors associated with learning problems and on behavioral and educational remedial approaches. (Also offered through distance education format.)

*Prerequisite(s):* 1 of FRHD\*2270, PSYC\*2450, PSYC\*2650 (also see psychology core statement)

<b>PSYC*3720 Psychology of Learning Difficulties and Disabilities II W (3-0) [0.50]</b>
Continuation of PSYC*3710. Students will develop and report on a systematic remedial project involving an underachieving school-age child. <i>Prerequisite(s):</i> PSYC*3710 (also see psychology core statement)
<b>PSYC*3800 Psychology and Education U (3-0) [0.50]</b>
The application of psychological principles and techniques to the study of the educational process. (Also offered through distance education format.) <i>Prerequisite(s):</i> PSYC*1100, (PSYC*1200 or FRHD*2270) (also see psychology core statement)
<b>PSYC*3850 Intellectual Disabilities U (3-0) [0.50]</b>
This course covers applied and theoretical aspects of intellectual disabilities, and lays a foundation for work in the area of intellectual disabilities. (Also offered through distance education format.) <i>Prerequisite(s):</i> FRHD*2270 or PSYC*2450 (also see psychology core statement)
<b>PSYC*3900 Psychology Research Internship F,W,S (0-6) [0.50]</b>
This course provides an experiential learning opportunity through the active participation of the student in a faculty member's ongoing research program. It is expected that students will develop a broader appreciation of the relationship between knowledge, theory and research while acquiring basic skills in research methodologies and modes of inquiry. The course will require involvement in both the practice and reporting of research. The student must consult the supervisory faculty member before selecting or registering for the course. <i>Prerequisite(s):</i> PSYC*1100, PSYC*1200, PSYC*2010 and at least 1.00 credits at the 2000 level of the psychology core <i>Restriction(s):</i> Instructor consent required.
<b>PSYC*3910 Psychology Externship F,W,S (0-6) [0.50]</b>
An independent program of study formally integrating the student's academic study with one or more work experiences, to be decided by the student in consultation with the supervisory faculty (normally the department's co-op coordinator) prior to registration in the course. In order to qualify for this course, the student must be employed in a work setting at the time of registration to help ensure that a suitable project is feasible in the context of a work placement or employment. The department is not responsible for obtaining employment. The course project is aimed at making a significant contribution to the work setting. The student must consult with the supervisory faculty before selecting or registering for the course. (Enrolment is limited. Not open to co-op students.) <i>Prerequisite(s):</i> (PSYC*1100, PSYC*1200, PSYC*2010 and at least 1.00 credits at the 2000 level of the psychology core) or enrolment in the B.Comm Program, Human Resources Management Major <i>Restriction(s):</i> Instructor consent required.
<b>PSYC*4050 Seminar in Animal Learning F (3-0) [0.50]</b>
Major areas of research in animal learning will be covered in a seminar format. Students will orally present research articles and/or review articles in a selected topic in Animal Learning. The selected topic will vary on the basis of the expertise of the instructor. Students will be expected to develop a research proposal as a significant component of the course. (H) <i>Prerequisite(s):</i> 14 credits including PSYC*2330 <i>Restriction(s):</i> Registration in a Psychology Major of an Honours Program or Neuroscience Minor; PSYC*3430
<b>PSYC*4310 Advanced Topics in Social Psychology U (3-0) [0.50]</b>
An in-depth examination of specific advances in social psychological research, theory, and/or applications. Specific topics, to be announced prior to course selection, will vary according to the interests of the instructor of the course. (H) <i>Prerequisite(s):</i> PSYC*3310 or PSYC*3500 (also see psychology core statement)
<b>PSYC*4320 Advanced Applied Social Psychology U (3-0) [0.50]</b>
This seminar course deals with topics of an applied social nature. This course may focus on a single or a variety of topics such as: health, forensics, conflict (inter-group and interpersonal), social justice and cultural issues. This course addresses both research and practice issues and covers a variety of theories and methodologies. (H) <i>Prerequisite(s):</i> PSYC*3310 or PSYC*3500

<b>PSYC*4330 Advanced Topics in I/O Psychology (H) U (3-0) [0.50]</b>
Students will examine theoretical and methodological issues in selected topic areas of industrial/organizational psychology. The focal area of the course, or range of industrial/organizational topics covered by the course, will vary depending on instructor. Selected topic areas may include leadership issues, gender issues, human rights issues, recruitment methods and outcomes, functional job analysis and validation methods, job performance criteria and appraisal tools, selection processes and tools, organizational justice, work attitudes, and prejudice and discrimination in the workplace. Specific topic areas will be announced prior to the course selection period. (H) <i>Prerequisite(s):</i> PSYC*3070, PSYC*3080
<b>PSYC*4370 History of Psychology U (3-0) [0.50]</b>
The historical roots of modern psychology. Students electing to major by completing the Honours Thesis Courses I and II should note that they are expected to also take either PSYC*4900, or this course, prior to, or concurrent with, either PSYC*4870 or PSYC*4880 (see Graduate Advisory Note under Major). (H) <i>Prerequisite(s):</i> 4.00 credits in psychology, with at least 1.00 credits at the 3000 level or above
<b>PSYC*4440 Contemporary Issues in Child Development U (3-0) [0.50]</b>
This course is primarily designed for students in the Psychology program whose special interests are developmental. Students will examine theoretical and methodological issues in a specific area of developmental psychology. The course will involve detailed evaluation of selected studies and when appropriate, student research projects. (H) <i>Prerequisite(s):</i> PSYC*2360, (PSYC*3440 or PSYC*3450)
<b>PSYC*4460 Seminar in Clinical Psychology F (3-0) [0.50]</b>
This course deals with issues and theories in clinical psychology. It is intended primarily for honours students in psychology who plan to pursue further training in clinical psychology at the graduate level or who plan to work in a setting where knowledge of clinical psychology would be an asset. Topics may include psychological assessment, treatment, and outcome research. Students will acquire an understanding of the scientific and professional roles of clinical psychologists, key concepts and techniques of the major orientations of psychotherapy, and current debates in the field. (H) <i>Prerequisite(s):</i> PSYC*3390 or PSYC*3460
<b>PSYC*4470 Behavioural Neuroscience Seminar W (3-0) [0.50]</b>
Major areas of behavioural neuroscience research will be covered in a seminar format. Students will be expected to develop a research proposal as a significant component of the course, and will prepare for this requirement through oral presentations and discussions of published research and/or review articles in a selected topic in Behavioural Neuroscience. The selected topic will vary on the basis of the expertise of the instructor. (H) <i>Prerequisite(s):</i> 14.00 credits including PSYC*2410 <i>Restriction(s):</i> Registration in one of: B.A. Psychology major, B.Sc. Psychology: Brain and Cognition major, or Neuroscience minor.
<b>PSYC*4500 Current Theoretical Issues in Psychology S,F,W (3-0) [0.50]</b>
An independent program of study in topics of current theoretical import in psychology, to be decided by the student in consultation with the supervisory faculty member before the student may select or register for the course. (H) <i>Prerequisite(s):</i> 4.00 credits in psychology, with at least 1.00 credits at the 3000 level or above <i>Restriction(s):</i> Instructor consent required.
<b>PSYC*4510 Current Issues in Psychology S,F,W (0-6) [0.50]</b>
The study of issues of current interests in psychology. Topics will vary with the interests of faculty members assigned to the course and will be announced prior to the course selection period. The course is available either as a senior lecture/seminar course with regularly scheduled class times, or as an independent study course with the topic and schedule decided in advance by the student in conjunction with a supervisory faculty member. (H) <i>Prerequisite(s):</i> 4.00 credits in psychology, with at least 1.00 credits at the 3000 level or above and previous study related to the topic area (also see psychology core statement) <i>Restriction(s):</i> Instructor consent required.
<b>PSYC*4600 Cognitive Neuroscience U (3-0) [0.50]</b>
This course will focus on methods used in contemporary cognitive neuroscience (including but not limited to: PET, functional MRI, EEG, intracranial stimulation and recording) as they aid in the elucidation of neural basis of behaviour. (H) <i>Prerequisite(s):</i> PSYC*2360, (1 of PSYC*2390, PSYC*2410, PSYC*2650), (also see psychology core statement) <i>Restriction(s):</i> PSYC*4400

**PSYC\*4750 Seminar in Motivation and Emotion U (3-0) [0.50]**

This course examines the topics of motivation and emotion from various subdisciplinary perspectives, adopting a senior seminar format and problem-centred approach. (H)

*Prerequisite(s):* 15.0 credits

**PSYC\*4870 Honours Thesis I S,F,W (3-0) [0.50]**

Under individual faculty supervision, students plan, develop, and write a research proposal and prepare an extensive review paper on their area of research. Group sessions are held on research ethics, subject protocols and computer data handling techniques. This course will be graded on a Pass/Fail basis. Note that enrolment in this course is limited and academic records are used for student selection. Course registration requires the signature of the Chair or the Associate Chair. This signature is contingent upon the student demonstrating they have obtained a Thesis Supervisor's signature on the department's Thesis Registration Form and have an academic standing appropriate for application to graduate programs (see Graduate Advisory under Major). As well, registration for Honours Thesis I will require that either PSYC\*4370 or PSYC\*4900 is taken prior to, or concurrent with, either PSYC\*4870 or PSYC\*4880. (H)

*Prerequisite(s):* PSYC\*3370, PSYC\*3380, 70% average across [(PSYC\*2010 or STAT\*2040), (1 of PSYC\*2040, PSYC\*3320, STAT\*2050)]

*Restriction(s):* Instructor consent required.

**PSYC\*4880 Honours Thesis II S,F,W (3-10) [1.00]**

This course is a continuation of PSYC\*4870. Students conduct research and write an undergraduate thesis under the direction of a faculty member. Note that registration in this course will require that either PSYC\*4370 or PSYC\*4900 is taken prior to, or concurrent with, either PSYC\*4870 or PSYC\*4880. (H)

*Prerequisite(s):* PSYC\*4870

**PSYC\*4900 Psychology Seminar U (3-0) [0.50]**

Student seminars and discussions will be organized around theoretical and substantive issues in the discipline of psychology. A major objective is to assist advanced undergraduate students to achieve a degree of synthesis of materials studied in their previous psychology courses (also see psychology core statement). Students electing to Major by completing the Honours Thesis I and II should note that they are expected to also take either PSYC\*4370, or this course, prior to, or concurrent with, either PSYC\*4870 or PSYC\*4880 (see Graduate Advisory under Major). (H)

*Prerequisite(s):* 14.00 credits (including 4.00 credits in psychology, with at least 1.00 credits at the 3000 level or above)

*Restriction(s):* Registration in a Psychology Major of an Honours program.

**PSYC\*4910 Co-operative Education Project I S,F,W (0-6) [0.50]**

An independent program of study formally integrating the student's academic study with 1 or more work experiences provided by the co-operative education program, to be decided by the student in consultation with the supervisory faculty. The course is normally to be taken concurrently with a co-operative education work term, with the project preferably aimed at making a significant contribution to the work setting. (H)

*Prerequisite(s):* 2 co-operative education work terms

*Restriction(s):* Instructor consent required.

## Real Estate and Housing

Department of Business - College of Management and Economics

### REAL\*1820 Real Estate and Housing F (3-0) [0.50]

This survey course acquaints students with the theories, practices and principles of real estate and housing. Topics include how real estate assets and markets differ from other assets, government involvement in the housing and real estate sectors, non-market housing in Canada, financing real estate, and development.

*Equate(s):* COST\*1820 , MCS\*1820

*Restriction(s):* COST\*1800 This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

### REAL\*2820 Real Estate Finance W (3-0) [0.50]

This course examines the financing of both residential and commercial investment real estate. A mathematical approach is used to examine the impact of various lender and borrower decisions about loan terms (amortization periods, pre-payment options, etc.). The evolution of the Canadian housing finance system is contrasted with that in the United States. New methods of financing real estate other than traditional mortgages are discussed.

*Prerequisite(s):* 5.00 credits

*Equate(s):* COST\*2820 , MCS\*2820

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

### REAL\*2850 Service Learning in Housing F (3-0) [0.50]

This course provides an introduction to ethics and social capital as they apply to the housing and real estate industries. Students will be required to participate in a 10-15 hour service learning exercise where they volunteer for a frontline housing agency/provider. They will then share their experiences with their classmates during the final week of classes.

*Prerequisite(s):* 4.00 credits

*Equate(s):* COST\*2850 , MCS\*2850

*Restriction(s):* MCS\*2810 , This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

### REAL\*3810 Real Estate Market Analysis F (3-0) [0.50]

In this course students examine the processes used to analyze supply and demand in the real estate market. The course focuses on using research methodologies to define the scope of analysis; identify data needs; collect information from various sources, including on-line resources; and interpret the results. Applications to different property types are discussed. Current market trends are also examined. As well, the course deals with marketing real estate: listing procedures, advertising, negotiating.

*Prerequisite(s):* ( MCS\*1820 or REAL\*1820), STAT\*2060

*Equate(s):* COST\*3810 , MCS\*3810

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

### REAL\*3870 Topics in Housing U (3-0) [0.50]

Lecture-discussion or seminar on a selected topic or area of specialization related to housing to be conducted by faculty with special interests or expertise in the area. Students should confirm with the department prior to course selection what topic(s), if any, will be offered during specific semesters.

*Prerequisite(s):* Will be indicated by the department when the course is offered.

*Equate(s):* COST\*3870 , MCS\*3870

*Restriction(s):* Instructor consent required.

### REAL\*3880 Topics in Housing U (3-0) [0.50]

Lecture-discussion or seminar on a selected topic or area of specialization related to housing to be conducted by faculty with special interests or expertise in the area. Students should confirm with the department prior to course selection what topic(s), if any, will be offered during specific semesters.

*Prerequisite(s):* Will be indicated by the department when the course is offered.

*Equate(s):* COST\*3880 , MCS\*3880

*Restriction(s):* Instructor consent required.

### REAL\*3890 Property Management W (3-0) [0.50]

Financial theory is used to examine the diversification benefits of including real estate with financial assets in an investment portfolio. Diversification strategies within a real estate portfolio are also covered. The marketing and leasing of real estate space culminates in a leasing negotiation exercise between pairs of students. Differing property management issues faced by managers of residential, office, retail, industrial and mixed use properties are covered.

*Prerequisite(s):* (1 of COST\*1800 , REAL\*1820, MCS\*1820 ) , (1 of ACCT\*2230, BUS\*2230 , ECON\*3560, HTM\*3070 , MCS\*2820 , REAL\*2820)

*Equate(s):* COST\*3890 , MCS\*3890

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

### REAL\*4820 Real Estate Appraisal F (3-0) [0.50]

This course deals with the basic principles involved in valuing real estate. The market comparison, cost and income approaches of appraisal are covered. The major emphasis in the course is on using discounted cash flow projections to value income-producing real estate. The term project involves the use of a spreadsheet program to estimate property value for a property chosen by the student. While valuation of single family homes is covered, the main emphasis is on investment real estate.

*Prerequisite(s):* (CIS\*1000 or MCS\*2020), (1 of ACCT\*2230, BUS\*2230 , ECON\*3560, HTM\*3070 , MCS\*2820 , REAL\*2820)

*Equate(s):* MCS\*4820

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

### REAL\*4830 Real Estate Development Project W (3-0) [1.00]

This is a capstone course covering the real estate development process and bringing together concepts from all other Real Estate and Housing courses. It deals with the development, redevelopment and renewal of real estate and housing services. Students will complete a phased project that considers all aspects of development feasibility including market analysis, physical constraints, financial viability and government regulation. (First offering - Winter 2015)

*Prerequisite(s):* 15.00 credits including , ( MCS\*3810 or REAL\*3810), ( MCS\*4820 or REAL\*4820)

*Restriction(s):* MCS\*3820, MCS\*4810, This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.

### REAL\*4840 Housing and Real Estate Law F (3-0) [0.50]

This course lays out the legal principles which guide the expanding and changing body of law dealing with housing and real estate development and forms of occupancy; statutory and regulatory matters are explored.

*Prerequisite(s):* 9.00 credits including MCS\*1000, (1 of COST\*1800 , MCS\*1820 , REAL\*1820), ( MCS\*2820 or REAL\*2820)

*Equate(s):* MCS\*4840

*Restriction(s):* This is a Priority Access Course and some restrictions may apply during some time periods. Please contact the department for more information.



## Sociology

### Department of Sociology and Anthropology

The Department of Sociology and Anthropology offers three types of courses: sociology courses with the prefix SOC\*; anthropology courses with the prefix ANTH\*; and departmental courses with the prefix SOAN\*.

Courses will normally be offered in the semesters designated. For information on other semesters these courses will be offered and the semesters those courses without designations will be offered, please check with the department. In addition to regularly scheduled courses, students may elect to do independent study. A student who wishes to do a reading course should first consult the professor with whom he/she wishes to work. Please note: a student is allowed a total of 1.00 credits only for reading courses.

SOAN courses will be used towards the Sociology specializations.

Please note: The availability of third and fourth year seminar courses will vary. Students must check with the Department of Sociology and Anthropology to see when seminar courses are available.

#### SOC\*1100 Sociology S,F,W (3-0) [0.50]

An introductory course dealing with the basic concepts and methods of sociology applied to societies, groups and individuals. Students will gain an understanding of basic social processes such as socialization, social exchange, deviance and conformity, social change and basic social institutions such as the economy, the polity, the family, religion, education. (Also offered through Distance Education format.)

#### SOC\*1500 Crime and Criminal Justice F,W (3-0) [0.50]

This course will introduce students to the study of crime and criminal justice. It will examine the various criminological theories, types of criminal behaviour, and the criminal justice system.

#### SOC\*2010 Canadian Society U (3-0) [0.50]

A description of the structure of Canadian society with its social, political and economic tensions.

*Prerequisite(s):* SOC\*1100

#### SOC\*2070 Social Deviance S,F,W (3-0) [0.50]

An introduction to some of the basic theories of deviance and social control and their application to selected social problems. (In spring semester offered through Distance Education format only.)

*Prerequisite(s):* SOC\*1100 or SOC\*1500

*Restriction(s):* Priority Access course. Enrolment may be restricted to particular programs or specializations. Please see the departmental website.

#### SOC\*2080 Rural Sociology W (3-0) [0.50]

An introduction to the structure and processes of rural society. This course deals with diverse topics such as agrarian movements, the rise of the agro-industrial complex, the role of the state in agriculture, the question of community, and rural environmental issues. A comparative perspective is cultivated, although the primary emphasis is on Canadian society.

*Prerequisite(s):* 1 of ANTH\*1150, GEOG\*1220, SOC\*1100

#### SOC\*2280 Society and Environment U (3-0) [0.50]

An introduction to the nature and dimensions of the environmental crisis. The values, interests and social institutions (including government and industry) that promote pollution or environmentalism will be considered. Issues to be examined may include global warming, nuclear energy, environmental toxins, species extinction and population growth pressures.

*Prerequisite(s):* 1 of ANTH\*1150, GEOG\*1220, SOC\*1100

#### SOC\*2390 Class and Stratification U (3-0) [0.50]

An examination of the persistent bases of social inequalities such as wealth, income, power and prestige including class formation, class consciousness, political activity and social mobility.

*Prerequisite(s):* SOC\*1100

#### SOC\*2700 Criminological Theory F,W (3-0) [0.50]

This course will examine the development of criminological theory from the late 1700s to contemporary times.

*Prerequisite(s):* SOC\*1500

#### SOC\*2760 Homicide S,F,W (3-0) [0.50]

This course will review legal definitions of homicide, statistical trends in homicide—both in Canada and internationally—and theoretical explanations of homicide. The course will also examine the key criminological/ sociological empirical research studies on the various types of homicide, such as: femicide, familialicide, serial and mass murder. (Offered through Distance Education format only.)

*Prerequisite(s):* 1 of ANTH\*1150, FRHD\*1010, PHIL\*1010, POLS\*1400, PSYC\*1100, PSYC\*1200, SOC\*1100, SOC\*1500

*Restriction(s):* Priority Access course. Enrolment may be restricted to particular programs or specializations. Please see the departmental website for more information.

#### SOC\*3040 Sociology of Social Welfare W (3-0) [0.50]

This course examines the major factors that shape the welfare state and considers what impact welfare policies have on people. Central to the discussion is welfare in Canada and what changes are desirable and feasible. (Offered in odd-numbered years.)

*Prerequisite(s):* SOAN\*2112, SOAN\*2120

#### SOC\*3110 Comparative Religious Systems W (3-0) [0.50]

An analysis of stability and change in patterns of religious beliefs, behaviour and institutions. (Offered in odd-numbered years.)

*Prerequisite(s):* SOAN\*2112, SOAN\*2120

#### SOC\*3130 Politics and Society U (3-0) [0.50]

An interpretation of the political process and its relationship to other aspects of the social structure, including such topics as political parties, movements, factions, citizen participation, power structures and the process of political exchange.

*Prerequisite(s):* SOAN\*2112, SOAN\*2120

#### SOC\*3310 Contemporary Theory F (3-0) [0.50]

This course outlines and evaluates the major theories in use today. A central aspect of the course is instruction in the application of these theories.

*Prerequisite(s):* SOAN\*2112, SOAN\*2120

#### SOC\*3340 Education, Change and Resistance U (3-0) [0.50]

An examination of educational institutions and their relationships to other sectors of society, in particular political and economic. Topics include the nature and objectives of education, equality of opportunity, measures of educational achievement and attainment, manifest and hidden curricula, and public policy.

*Prerequisite(s):* SOAN\*2112, SOAN\*2120

#### SOC\*3380 Society and Nature U (3-0) [0.50]

The course provides a range of worldviews which address the relations between society and the environment. Material in the course will include historical perspectives and contemporary perspective, thereby allowing students to understand that worldviews concerning this crucial relation are dynamic, changing and reflect the diverse, and sometimes competing, perspectives of a society within particular moments of history.

*Prerequisite(s):* GEOG\*2210 or SOC\*2280

#### SOC\*3410 Individual and Society U (3-0) [0.50]

Examining social-psychology from the sociological perspective, this course deals with the relation between social and cultural structure, on the one hand, and self or personality on the other. Employing symbolic interactionism and affect control theory, the course shows how social interaction mediated by language is the well-spring of both social cognitions and emotions.

*Prerequisite(s):* SOAN\*2112, SOAN\*2120

#### SOC\*3490 Law and Society S,W (3-0) [0.50]

This course examines the social basis of law. Specific topics include the law as an instrument of stability or change, and the role of law makers, law enforcers and interpreters, including the legal profession, the police, judges and courts. (Also offered through Distance Education format.)

*Prerequisite(s):* (SOAN\*2112 or SOC\*2700), SOAN\*2120

*Restriction(s):* Priority Access course. Enrolment may be restricted to particular programs or specializations. Please see the departmental website.

#### SOC\*3710 Young Offenders F,W (3-0) [0.50]

This course examines concerns about youth crime in Canada and elsewhere. It examines the history of legislation to control youth crime, criminal justice processing and practices, public reactions and concerns about youth crime and theoretical models used to explain youth crime.

*Prerequisite(s):* (SOAN\*2112 or SOC\*2700), SOAN\*2120

*Restriction(s):* Registration in Anthropology, Criminal Justice & Public Policy or Sociology (major, minor or area of concentration).

**SOC\*3730 Courts and Society W (3-0) [0.50]**

This course is an introduction to the social processes involved in the court, particularly the criminal court. Typical concerns will be the place of courts in society, public opinion and confidence in courts, purposes and principles of sentencing, sentencing reforms and disparities (e.g., across gender and race), the role of criminal records, juries, the roles of judges, and alternatives to criminal courts.

*Prerequisite(s):* (SOAN\*2112 or SOC\*2700), SOAN\*2120

*Restriction(s):* Registration in Anthropology, Criminal Justice & Public Policy or Sociology (major, minor or area of concentration).

**SOC\*3740 Corrections and Penology F (3-0) [0.50]**

This course will examine the current state of knowledge regarding the role of corrections and penology. It will examine such specific issues as public perception and reaction to the criminal justice system's methods of punishment and treatment of criminal offenders, the effectiveness of sentencing options and policies, including fines, probation, prison sentences and parole. It will also examine the various theoretical and methodological approaches to the study of courts, corrections and penology.

*Prerequisite(s):* (SOAN\*2112 or SOC\*2700), SOAN\*2120

*Restriction(s):* Registration in Anthropology, Criminal Justice & Public Policy or Sociology (major, minor or area of concentration).

**SOC\*3750 Police in Society F,W (3-0) [0.50]**

This course will examine the role of police in society. It will examine theories of policing, the history of policing and such issues as police citizen interaction, relations with visible minorities, methods for controlling police behaviour, and the effectiveness of the police in carrying out specific policy directives.

*Prerequisite(s):* (SOAN\*2112 or SOC\*2700), SOAN\*2120

*Restriction(s):* Registration in Anthropology, Criminal Justice & Public Policy or Sociology (major, minor or area of concentration).

**SOC\*3840 Seminar in Sociology F,W (3-0) [0.50]**

This course will be offered as a structured seminar on various topics depending upon the interests of the faculty member teaching the course. Topics will be announced and course outlines will be available at course selection. The availability of third and fourth year seminar courses will vary. Students must check with the Department of Sociology and Anthropology to see when seminar courses are available.

*Prerequisite(s):* 10.00 credits including (1 of SOAN\*2112, SOC\*2080, SOC\*2700), SOAN\*2120

**SOC\*3850 Seminar in Sociology F,W (3-0) [0.50]**

This course will be offered as a structured seminar on various topics depending upon the interests of the faculty member teaching the course. Topics will be announced and course outlines will be available at course selection. The availability of third and fourth year seminar courses will vary. Students must check with the Department of Sociology and Anthropology to see when seminar courses are available.

*Prerequisite(s):* 10.00 credits including (1 of SOAN\*2112, SOC\*2080, SOC\*2700), SOAN\*2120

**SOC\*3950 Special Projects in Sociology S,F,W (3-0) [0.50]**

This special study option/reading course is designed to provide advanced undergraduates with an opportunity to explore independently the frontiers and foundations of a field of knowledge. Under supervision, the student will study in greater depth topics related to regular upper-level courses offered in the department which the student has taken or is taking. Permission of the instructor who will be supervising the study is required.

*Prerequisite(s):* 10.00 credits

*Restriction(s):* Instructor consent required. Please note, a student is allowed a total of 1.00 credits only for reading courses.

**SOC\*4010 Violence and Society W (3-0) [0.50]**

This course will focus on the changing nature of violence in our society by critically evaluating theory, research and public policy on the causes and control of violence. The links among structural, institutional and interpersonal violence will be examined as well as the social construction of violence, particularly why some forms of violence are considered to be more serious social problems than others.

*Prerequisite(s):* 14.00 credits including (SOC\*2700 or SOC\*3310), (SOAN\*3120 or POLS\*3650)

*Restriction(s):* Restricted to students in BAH:CJPP and BAH:SOC with an average of 70% in all course attempts in Political Science, Sociology and Sociology and Anthropology courses

**SOC\*4030 Advanced Topics in Criminology F (3-0) [0.50]**

An in-depth study of selected issues in criminology.

*Prerequisite(s):* (2 of SOC\*3490, SOC\*3710, SOC\*3730, SOC\*3740, SOC\*3750), (1 of ANTH\*3690, SOC\*2700, SOC\*3310), (SOAN\*3120 or POLS\*3650)

*Restriction(s):* Registration in Criminal Justice & Public Policy (major, minor or area of concentration).

**SOC\*4200 Advanced Topics in Criminal Justice W (3-0) [0.50]**

This is an in-depth study of issues in criminal justice.

*Prerequisite(s):* 14.00 credits including (2 of SOC\*3490, SOC\*3710, SOC\*3730, SOC\*3740, SOC\*3750), (1 of ANTH\*3690, SOC\*2700, SOC\*3310), (SOAN\*3120 or POLS\*3650)

*Restriction(s):* Restricted to students in BAH:CJPP with an average of 70% in all course attempts in Political Science, Sociology and Sociology and Anthropology courses

**SOC\*4210 Advanced Topics in Rural Sociology U (3-0) [0.50]**

A critical examination of the research literature in rural sociology, both in industrial and industrializing societies.

*Prerequisite(s):* 12.50 credits including (SOAN\*2120 or GEOG\*2210), SOC\*2080

**SOC\*4230 Comparative Sociology W (3-0) [0.50]**

Societies and social institutions in cross-cultural perspectives. The focus of this course will vary but in every instance will explicitly involve cross-cultural comparisons. (Offered in even-numbered years.)

*Prerequisite(s):* 12.50 credits including SOAN\*2120, SOC\*2080

**SOC\*4300 Theoretical and Methodological Issues U (3-0) [0.50]**

This course will provide an opportunity for sociology majors to consider in detail the integration of theoretical and methodological issues at an advanced level. It is meant to engage students in the latest developments in a particular area of the discipline. Course topics will be announced and course outlines will be available at course selection time. This course is highly recommended to students who are considering graduate work in sociology.

*Prerequisite(s):* 15.00 credits including SOAN\*3070, SOAN\*3120, SOC\*3310

**SOC\*4310 Advanced Topics in Canadian Society U (3-0) [0.50]**

A detailed examination of selected topics in Canadian society such as regional tensions, aboriginal issues, implications of free trade, constitutional reform, social programs.

*Prerequisite(s):* 12.50 credits including (ANTH\*3690 or SOC\*3310), SOAN\*3070, SOC\*2010

**SOC\*4410 Women, Work and Public Policy U (3-0) [0.50]**

In this course students will critically assess the transformation of women's work in contemporary society. A range of topics pertaining to women's work will be explored with particular attention paid to the processes through which class, gender, race, ethnicity, and age shape divisions of work. The course will also focus on theories that have attempted to explain the transformation of women's work.

*Prerequisite(s):* 12.50 credits including (1 of ANTH\*2160, SOAN\*2112, SOC\*2700), (SOAN\*2120 or WMST\*3000)

**SOC\*4420 Sociology of Food Systems F (3-0) [0.50]**

This course is directed towards upper level students in sociology and related disciplines who wish to consider the variety of contentious issues surrounding food in the contemporary world. The course will encourage a sociological approach to food systems that is both historically informed and comparative in scope.

*Prerequisite(s):* 12.50 credits including (ANTH\*2160 or SOAN\*2112), SOC\*2080, SOAN\*2120

**SOC\*4430 Alternative Social Possibilities W (3-0) [0.50]**

This course uses the full range of sociological theory to suggest what alternative ways of organizing society might be possible. Students will examine different accounts of theories of why outcomes are not equal from functionalist theories of stratification to theories of class domination and exploitation to economic market accounts to feminist accounts based on patriarchy. This course will allow students to bring together for themselves a wide range of theories used in other courses and apply them to how their own ideals might be implemented.

*Prerequisite(s):* 12.50 credits including (1 of ANTH\*3690, SOC\*2700, SOC\*3310), (POLS\*3180 or SOAN\*3120)

**SOC\*4450 Semiotics: Theory & Methodology F (3-0) [0.50]**

In this seminar students are introduced to semiotics as an interdisciplinary field, both as a theory and as a methodology.

*Prerequisite(s):* 12.50 credits including SOAN\*2120, (ANTH\*3690 or SOC\*3310)

<b>SOC*4700 Seminar: Theoretical Issues in Sociology U (3-0) [0.50]</b>
An examination of selected theoretical issues. The availability of third and fourth year seminar courses will vary. Students must check with the Department of Sociology and Anthropology to see when seminar courses are available.
<i>Prerequisite(s):</i> 12.50 credits including SOC*3310, SOAN*3070, SOAN*3120
<b>SOC*4740 Seminar in Sociology F,W (3-0) [0.50]</b>
This course will be offered as a structured seminar on various topics depending upon the interests of the faculty member teaching the course. Topics will be announced and course outlines will be available at course selection. The availability of third and fourth year seminar courses will vary. Students must check with the Department of Sociology and Anthropology to see when seminar courses are available.
<i>Prerequisite(s):</i> 12.50 credits including SOC*3310, SOAN*3070, SOAN*3120
<b>SOC*4840 Seminar in Sociology F,W (3-0) [0.50]</b>
This course will be offered as a structured seminar on various topics depending upon the interests of the faculty member teaching the course. Topics will be announced and course outlines will be available at course selection. The availability of third and fourth year seminar courses will vary. Students must check with the Department of Sociology and Anthropology to see when seminar courses are available.
<i>Prerequisite(s):</i> 12.50 credits including SOC*3310, SOAN*3070, SOAN*3120
<b>SOC*4880 Special Projects in Sociology S,F,W (3-0) [0.50]</b>
This special study/reading course option is designed to provide advanced undergraduates with an opportunity to explore independently the frontiers and foundations of a field of knowledge. Under supervision, the student will study in greater depth topics related to regular upper-level courses offered in the department which the student has taken or is taking. Permission of the instructor who will be supervising the project is required.
<i>Prerequisite(s):</i> 12.50 credits
<i>Restriction(s):</i> Instructor consent required. Please note, a student is allowed a total of 1.00 credits only for reading courses.
<b>SOC*4890 Special Projects in Sociology S,F,W (3-0) [0.50]</b>
This special study/reading course option is designed to provide advanced undergraduates with an opportunity to explore independently the frontiers and foundations of a field of knowledge. Under supervision, the student will study in greater depth topics related to regular upper-level courses offered in the department which the student has taken or is taking. Permission of the instructor who will be supervising the project is required.
<i>Prerequisite(s):</i> 12.50 credits
<i>Restriction(s):</i> Instructor consent required. Please note, a student is allowed a total of 1.00 credits only for reading courses.
<b>SOC*4900 Honours Sociology Thesis I S,F,W (3-0) [0.50]</b>
Development and design of an honours thesis proposal conducted under the supervision of a faculty member. Recommended to Honours students.
<i>Prerequisite(s):</i> 15.00 credits including SOC*3310, SOAN*3070, SOAN*3120. CJPP students must have 15.00 credits including SOC*2700, SOAN*3120, or POLS*3650
<i>Restriction(s):</i> A cumulative average of 70% in all Sociology and Anthropology courses. Instructor consent required
<b>SOC*4910 Honours Sociology Thesis II S,F,W (3-0) [0.50]</b>
Completion and presentation of honours thesis.
<i>Prerequisite(s):</i> SOC*4900
<i>Restriction(s):</i> Instructor consent required.

## Sociology and Anthropology

### Department of Sociology and Anthropology

The Department of Sociology and Anthropology offers three types of courses: sociology courses with the prefix *SOC*\*; anthropology courses with the prefix *ANTH*\*; and departmental courses with the prefix *SOAN*\*.

#### SOAN\*2040 Globalization of Work and Organizations F,W (3-0) [0.50]

This course examines the sociological dimensions of work and occupations. Specific topics may include: the organizational context of work, occupational and labour market structures, job satisfaction, industrial relations, technological change, and the effects of gender, age, race/ethnicity on how work and employment are experienced.

*Prerequisite(s):* ANTH\*1150 or SOC\*1100

#### SOAN\*2111 Classical Theory F (3-0) [0.50]

First part of the two-semester course SOAN\*2111/2. Refer to SOAN\*2111/2 for course description.

*Prerequisite(s):* 1 of ANTH\*1150, SOC\*1100, SOC\*1500

#### SOAN\*2111/2 Classical Theory F-W [1.00]

This course explores the origins and early development of sociological theory in its classical and early contemporary traditions. When you select it you must select SOAN\*2111 in the Fall semester and SOAN\*2112 in the Winter semester. A grade will not be assigned to SOAN\*2111 until SOAN\*2112 has been completed.

*Prerequisite(s):* 1 of ANTH\*1150, SOC\*1100, SOC\*1500

#### SOAN\*2112 Classical Theory W (3-0) [0.50]

Second part of the two-semester course SOAN\*2111/2. Refer to SOAN\*2111/2 for course description.

*Prerequisite(s):* SOAN\*2111

#### SOAN\*2120 Introductory Methods F,W (3-0) [0.50]

A general introduction to the process of social research emphasizing research design, techniques of data collection, analysis and interpretation of research results.

*Prerequisite(s):* 1 of ANTH\*1150, SOC\*1100, SOC\*1500

#### SOAN\*2290 Identities and Cultural Diversity U (3-0) [0.50]

An examination of the interrelationships among Canadian ethnic, racial and linguistic groups including their locations in the Canadian mosaic.

*Prerequisite(s):* ANTH\*1150 or SOC\*1100

#### SOAN\*2400 Introduction to Gender Systems S,F (3-0) [0.50]

An introduction to the examination of the characteristics of gender relationships both historically and cross-culturally. Amongst the emphases are theoretical approaches to gender analysis, methodologies, case studies and attention to themes such as class and stratification, race and ethnicity, identities and global restructuring as these shape gender dynamics. (Also offered through Distance Education format.)

*Prerequisite(s):* ANTH\*1150 or SOC\*1100

#### SOAN\*3070 Qualitative and Observational Methods W (3-0) [0.50]

Non-quantitative techniques in social research including participant observation, unobtrusive methods, case studies and interviewing.

*Prerequisite(s):* SOAN\*2120

#### SOAN\*3100 Gender Perspectives on Families and Households U (3-0) [0.50]

This course explores families and households from a gender perspective, using insights from sociology and anthropology.

*Prerequisite(s):* (1 of ANTH\*2160, SOAN\*2112, SOAN\*2400), (SOAN\*2120 or WMST\*3000)

*Restriction(s):* FRHD\*3120

#### SOAN\*3120 Quantitative Methods F (3-0) [0.50]

This course introduces basic descriptive and inferential techniques used in quantitative social research. Students will acquire the skills needed to perform basic analyses and to read the research literature. They will also acquire skills in using a standard computer package to perform data analyses. Topics include: data organization, sample description, hypothesis testing and measures of association. Note: Students who have completed any other statistics course(s) should consult with the instructor. In some instances, SOC\*3120 may be waived as a departmental requirement.

*Prerequisite(s):* SOAN\*2120

*Restriction(s):* Priority Access course. Enrolment may be restricted to particular programs or specializations. See department for more information.

#### SOAN\*3240 Gender & Global Inequality I F (3-0) [0.50]

In this course, students will develop their ability to use a gender perspective to study social change in the context of global inequalities. Students will develop their knowledge of the core concepts and theories in Gender and Development (GAD) thinking and practice, while exploring the development process from a critical perspective.

*Prerequisite(s):* 1 of ANTH\*2160, IDEV\*2010, IDEV\*2500, SOC\*2080

#### SOAN\*3250 Social Change in Latin America F (3-0) [0.50]

This course provides a critical, comparative examination of the social-structural and cultural transformations occurring in Latin America in a context of deepening integration with the global north. Topics to feature prominently may include land reform, depeasantization, out-migration, maquiladoras, informal employment, race and ethnic relations, religiosity and religious identification, and social movements. The particular sub-regional focus may vary.

*Prerequisite(s):* 1 of ANTH\*2160, IDEV\*2010, IDEV\*2500, SOC\*2080

#### SOAN\*3460 Ethnicity and Aging W (3-0) [0.50]

This course provides an examination of ethnic social structure, ethnicity, and aging. Variations in age related behaviour associated with ethnic groups in Canada will be viewed from a sociological and gerontological perspective. (Offered in odd-numbered years.)

*Prerequisite(s):* (SOAN\*2112 or ANTH\*2160), SOAN\*2120, SOAN\*2290

#### SOAN\*3680 Perspectives on Development F (3-0) [0.50]

This course examines theories and processes relating to international development and the responses to these by anthropologists and/or sociologists.

*Prerequisite(s):* 1 of ANTH\*2160, IDEV\*2010, IDEV\*2500, SOC\*2080

*Restriction(s):* ANTH\*3680 . Priority Access course. Enrolment may be restricted to particular programs or specializations. See department for more information.

#### SOAN\*4220 Gender and Change in Rural Canada F (3-0) [0.50]

This course examines socio-cultural structures affecting historically gendered positions and roles in rural Canada. (Offered in odd-numbered years.)

*Prerequisite(s):* 12.50 credits including (ANTH\*2160 or SOC\*2080), (SOAN\*2120 or WMST\*3000)

#### SOAN\*4230 Gender & Global Inequality II W (3-0) [0.50]

An in-depth and critical examination of a range of gender issues in the context of development, this course aims to enhance students' ability to critically analyze development theory and practices using gender analysis. It provides students an opportunity to deepen their understanding of gender issues in a global context, with the aim of further equipping them to participate effectively in gender and development-related research, policy-making, and implementation.

*Prerequisite(s):* 12.50 credits including SOAN\*3240, (1 of GEOG\*3090, POLS\*3180, SOAN\*2120, WMST\*3000)

*Restriction(s):* SOAN\*4240

#### SOAN\*4250 Energy and Society F (3-0) [0.50]

This seminar addresses the links between social relations and various types of energy including petroleum, other hydrocarbons, nuclear and solar energies. Topics may include corporations, states, international organizations and popular movements.

*Prerequisite(s):* 12.50 credits including SOAN\*2120, (1 of ANTH\*2160, SOAN\*2112, SOC\*2080)

#### SOAN\*4320 Transition from School to Work W (3-0) [0.50]

This applied course examines the evolving research and models in the transitions from school to work area. There is an evolving literature in this area based, in part, on the successful application of research in the transition from high school to postsecondary education. This 'capstone' course also considers the practical issues involved in making such a move, considering the knowledge, skills, and values needed by university students to succeed in the modern workplace (public, private, and not-for-profit sectors) in Canada. Students will complete an "Action Sociology/Anthropology Project," as well as a "Skills Portfolio," and other work related to their own transition.

*Restriction(s):* Registration in Sociology, Anthropology or Criminal Justice & Public Policy majors in semester 7 or 8.

#### SOAN\*4500 Community Development U (3-0) [0.50]

An analysis of approaches to community development defined as planned, change-directed action undertaken by individuals, groups and organizations. The course will include the examination of actual community development practices.

*Prerequisite(s):* (1 of ANTH\*2160, IDEV\*2010, IDEV\*2500, SOC\*2080), (GEOG\*2210 or SOAN\*2120)

*Restriction(s):* SOAN\*3300

## Soil Science

### School of Environmental Sciences

#### **SOIL\*2010 Soil Science S,F,W (3-2) [0.50]**

This course is an introduction to the principles of soil science - the origin of soils, their classification and interpretation in natural and modified environments. Soil will be studied as a product of the natural environment, with a focus on formation processes and changes which occur when it is modified through use. A variety of uses including agriculture, forestry, recreation, and urban development will be considered. This course is not for B.Sc.(Agr.) students. (Also offered through Distance Education format.)

#### **SOIL\*3050 Land Utilization F (3-1) [0.50]**

Principles of land utilization and planning at the global, national, regional and local levels. Land characterization and classification using photo-interpretive techniques and computerized soil survey interpretive programs. Land capability/suitability for agriculture, forestry and engineering purposes. Emphasis on specific land use issues in Canada.

*Prerequisite(s):* 1 of AGR\*2301/2 , AGR\*2320, GEOG\*1300, GEOL\*1000 , SOIL\*2010

#### **SOIL\*3060 Environmental Soil Chemistry F (3-2) [0.50]**

The formation and properties of clay minerals and organic matter; ionic exchange, soil acidity, and alkalinity, oxidation and reduction potential, and dissolution and precipitation. Laboratory sessions will illustrate principles of soil chemistry.

*Prerequisite(s):* 1 of AGR\*2301/2 , AGR\*2320, SOIL\*2010

#### **SOIL\*3070 Environmental Soil Physics F (3-3) [0.50]**

Practical aspects of water movement and contaminant transport in soils. Hands-on experience with standard laboratory and field methods of measuring soil physical properties. Applications of soil physics in characterizing pathogen and nutrient transport to groundwater, landfill cap and linear design, turf management.

*Prerequisite(s):* 1 of MATH\*1080, AGR\*2301/2 , AGR\*2320, SOIL\*2010

#### **SOIL\*3080 Soil and Water Conservation S,F (2-3) [0.50]**

A lecture-demonstration course on the processes leading to deterioration of soil and water quality, the impact of deterioration on use, and preventative or corrective measures. Soil erosion by water and wind, soil compaction and salinization. Drainage channel maintenance, sedimentation and nutrient enrichment of water. Conservation programs and policies. Reclamation of severely disturbed soils and saline-sodic soils. Emphasis will be on concepts and solutions to problems in a systems approach. (Also offered through Distance Education format.)

*Prerequisite(s):* 1 of AGR\*2301/2 , AGR\*2320, SOIL\*2010

#### **SOIL\*3200 Environmental Soil Biology W (3-3) [0.50]**

Soil biological processes involving both microflora and fauna with emphasis on waste management, soil fertility and structure, plant residue decomposition and xenobiotic compound biodegradation. Students will apply this knowledge in a project involving biodegradation of an organic waste.

*Prerequisite(s):* 10.00 credits including 1 of AGR\*2301/2 , AGR\*2320, SOIL\*2010

#### **SOIL\*4090 Soil Management F (3-1) [0.50]**

A lecture-tutorial course on the practical aspects of soil management for crop production as they relate to the physical, chemical and biological properties of soils; major emphasis is placed on soil fertility as related to field soil properties and fertilizer, lime and manure use, soil and plant testing for mineral nutrients. The beneficial aspects of drainage, irrigation, erosion control and related tillage practices on soil fertility are also presented. Due regard is given to both economic and environmental aspects of soil management practices.

*Prerequisite(s):* 1 of AGR\*2301/2 , AGR\*2320, SOIL\*2010

#### **SOIL\*4130 Soil and Nutrient Management F (4-3) [0.50]**

This course consists of the same lectures and seminars as SOIL\*4090, but with an additional laboratory. The laboratory portion will focus on the regulatory requirements as stated under the Nutrient Management Act, 2001. Students will discuss nutrient management issues and gain practical experience using the NMAN software program.

*Prerequisite(s):* 1 of AGR\*2301/2 , AGR\*2320, SOIL\*2010

*Restriction(s):* ENVM\*1070, SOIL\*4090

#### **SOIL\*4250 Soils in the Landscape F (3-3) [0.50]**

This course has field, laboratory and classroom components. It focuses on soil spatial and temporal variability, evaluating soil properties in relation to controlling factors and processes, on local to global scales. Students are exposed to standard procedures for collecting soil data in the field and laboratory, highlighting sampling design and data extrapolation, as well as relevant applications of digital imaging of soil (micropedology) and landscapes. Principles of soil classification are discussed and several systems are introduced, emphasizing the Canadian System of Soil Classification; key concepts associated with the production of soil maps and reports, as well as the role of geographic information systems in archiving and interpreting soil information, are also examined. Students are required to notify the designated departmental instructor, of their intention to participate in this course, during the previous winter semester (or earlier, if going on exchange programs). This course has field camps which run during the week preceding the Fall semester. A fee is charged to cover some costs of field activities.

*Prerequisite(s):* 12.50 credits including (1 of AGR\*2320, GEOL\*1050, GEOL\*1100, SOIL\*2010)

*Restriction(s):* SOIL\*3170 , SOIL\*4170 Restricted to B.Sc.(Agr.) Agroecosystem Management or B.Sc.(Env.) Earth and Atmospheric Science majors or B.B.R.M. Instructor consent required.

## Statistics

*Department of Mathematics and Statistics*

*Suggested initial course sequences:*

1. For students interested in applied statistics a minimal course sequence is: (STAT\*2040 or STAT\*2100 ), STAT\*2050, STAT\*3210, STAT\*3240, STAT\*3320.
2. Credit may be obtained in only 1 of STAT\*2050 or STAT\*2090 and only 1 of STAT\*2040, STAT\*2060, STAT\*2080, STAT\*2100 , STAT\*2120.
3. Graduate students may be admitted to later parts of a sequence by permission of the department.
4. Students who major or minor in Statistics may not receive credit for the following courses unless taken to satisfy the requirements of another program: ECON\*2740, PSYC\*2010, PSYC\*3320 , .

### **STAT\*2040 Statistics I S,F,W (3-2) [0.50]**

A course stressing the practical methods of Statistics. Topics include: descriptive statistics; univariate models such as binomial, Poisson, uniform and normal; central limit theorem; expected value; the t, F and chi-square models; point and interval estimation; hypothesis testing methods up to two-sample data; simple regression and correlation; ANOVA for CRD and RCBD. Assignments will deal with real data from the natural sciences. Laboratory sessions involve statistical computing and visualization using appropriate statistical software.

*Prerequisite(s):* 1 of 4U Calculus and Vectors, Advanced Functions and Calculus, OAC Calculus, MATH\*1080

*Restriction(s):* STAT\*1000 , STAT\*2060, STAT\*2080, STAT\*2100 , STAT\*2120

### **STAT\*2050 Statistics II S,F,W (3-2) [0.50]**

In this course, students will learn how to implement good study design and analyze data from complex studies. This course follows naturally from STAT\*2040 and features both previously unseen statistical techniques, as well as studying in greater depth some topics covered in STAT\*2040. These topics will include: experiments and observational studies; a review of t-tests and confidence intervals; confounding variables; association and causality; Analysis of Variance (ANOVA); simple and multiple linear regression; binary responses (logistic regression); odds ratios and relative risk; and an introduction to experimental design (including blocked designs and factorial treatment designs). Assignments carried out using modern statistical software will form the basis for mastering the material.

*Prerequisite(s):* STAT\*2040

*Restriction(s):* BIOL\*2250, STAT\*2090, STAT\*2250

### **STAT\*2060 Statistics for Business Decisions F (3-2) [0.50]**

This course is designed for students interested in the application of statistics in a business setting. Topics covered will include the role of statistics in business decisions, organization of data, frequency distributions, probability, normal and sampling distributions, hypothesis tests, linear regression and an introduction to time series, quality control and operations research. (Also offered through Distance Education format.)

*Prerequisite(s):* (4U mathematics or equivalent) or 0.50 credit in mathematics

*Restriction(s):* STAT\*2040, STAT\*2080, STAT\*2120 Not available to B.Sc. students.

### **STAT\*2080 Introductory Applied Statistics I F (3-2) [0.50]**

The topics covered in this course include: Frequency distributions, graphing and tabulation of data; measures of central tendency, variability and association; elementary probability; hypothesis testing and confidence intervals; basic concepts of experimental design; treatment designs; simple linear regression and correlation. Examples come from a variety of disciplines, including family studies, education, marketing, medicine, psychology and sociology.

*Prerequisite(s):* (4U mathematics or equivalent) or 0.50 credit in mathematics

*Restriction(s):* STAT\*2040, STAT\*2060, STAT\*2100 , STAT\*2120 B.Sc. students cannot take this course for credit.

### **STAT\*2090 Introductory Applied Statistics II W (3-2) [0.50]**

The topics covered in this course include: analysis of qualitative data; analysis of variance for designed experiments; multiple regression; exposure to non-parametric methods; power and sample size calculations; special topics such as logistic regression. Examples come from a variety of disciplines, including nutrition, family studies, education, marketing, medicine, psychology and sociology.

*Prerequisite(s):* STAT\*2080

*Restriction(s):* BIOL\*2250, STAT\*2050, STAT\*2250

### **STAT\*2120 Probability and Statistics for Engineers F,W (3-1) [0.50]**

The topics covered in this course include: Sample spaces; probability, conditional probability and independence; Bayes' theorem; probability distributions; probability densities; algebra of expected values; descriptive statistics; inferences concerning means, variances, and proportions; curve fitting, the method of least squares and correlation. An introduction to quality control and reliability is provided. This course is recommended for students in the B.Sc.(Eng.) program.

*Prerequisite(s):* MATH\*1210 or MATH\*2080

*Restriction(s):* STAT\*2040, STAT\*2060, STAT\*2080, STAT\*2100

### **STAT\*2250 Biostatistics and the Life Sciences W (3-2) [0.50]**

This course in biostatistical methods will emphasize the design of research projects, data gathering, analysis and the interpretation of results. Statistical concepts underlying practical aspects of biological research will be acquired while working through the process of scientific enquiry. Computer laboratory sessions will focus on practical data visualization and statistical analysis using statistical software. Basic statistical methods are reviewed, followed by more advanced topics that will include some or all of the following: two-factor and multi-factor Analysis of Variance (ANOVA), simple and multiple linear regression, analysis of covariance, the general linear model, contingency table analysis and logistic regression. Concepts related to study design that will be discussed include sampling, confounding, paired designs, blocked designs, and factorial treatment designs. (Also listed as BIOL\*2250.) Department of Mathematics and Statistics and Department of Integrative Biology.

*Prerequisite(s):* STAT\*2040

*Equate(s):* BIOL\*2250

*Restriction(s):* STAT\*2050, STAT\*2090

### **STAT\*3100 Introductory Mathematical Statistics I F (3-0) [0.50]**

The topics covered in this course include: Probability spaces; discrete and continuous random variables; multivariate distributions; expectations; moments, Chebyshev's inequality, product moments; sums of random variables, generating functions; Gamma, Beta, t and F distributions; central limit theorem; sampling distributions.

*Prerequisite(s):* (MATH\*1210 or MATH\*2080 ), (STAT\*2040 or STAT\*2120)

### **STAT\*3110 Introductory Mathematical Statistics II W (3-0) [0.50]**

Estimation, unbiasedness, Cramer-Rao inequality, consistency, sufficiency, method of moments, maximum likelihood estimation; hypothesis testing, Neyman-Pearson lemma, likelihood ratio test, uniformly most powerful test; linear regression and correlation; non-parametric methods.

*Prerequisite(s):* STAT\*3100

### **STAT\*3210 Experimental Design W (3-0) [0.50]**

Basic principles of design: randomization, replication, and local control (blocking); RCBD, Latin square and crossover designs, incomplete block designs, factorial and split-plot experiments, confounding and fractional factorial designs, response surface methodology; linear mixed model computer analysis of the designs; nonparametric methods; Taguchi philosophy.

*Prerequisite(s):* STAT\*2050, STAT\*3240

*Restriction(s):* STAT\*4220

### **STAT\*3240 Applied Regression Analysis F (3-2) [0.50]**

This course reviews simple linear regression and introduces multiple regression with emphasis on theory of least squares estimation, residual analysis, and model interpretation. Within the multiple regression context, transformations of variables, interactions, model selection techniques, ANOVA, influence diagnostics and multicollinearity will be discussed. Topics may also include Box-Cox transformations, weighted regression, and logistic and Poisson regression. This course is supplemented with computer labs involving interactive data analysis using statistical software.

*Prerequisite(s):* (MATH\*1210 or MATH\*2080 ), (MATH\*2150 or MATH\*2160, may be taken concurrently), STAT\*2050

### **STAT\*3320 Sampling Theory with Applications F (3-0) [0.50]**

This course focuses on the design and analysis of survey samples for finite populations. Topics covered include: non-probability and probability sampling, simple random sampling, stratified sampling, cluster sampling, systematic sampling, double sampling, two-phase sampling and multi-stage cluster sampling. Expectation, variance estimation procedures and sample size calculations for the above techniques are included.

*Prerequisite(s):* (MATH\*1210 or MATH\*2080 ), (1 of STAT\*2050, STAT\*3240, STAT\*3100)

**STAT\*3510 Environmental Risk Assessment W (3-0) [0.50]**

Contemporary statistical methods for assessing risk are discussed. Topics covered include: dose-response models, survival analysis, relative risk analysis, bioassay, estimating methods for zero risk, trend analysis, survey of models for assessing risk. Case studies are used to illustrate the methods.

*Prerequisite(s):* (1 of MATH\*1000 , MATH\*1080, MATH\*1200), (1 of BIOL\*2250, STAT\*2050, STAT\*2250)

**STAT\*4050 Topics in Applied Statistics I F (3-0) [0.50]**

Topics such as statistical computing procedures, quality control, bioassay, survival analysis and introductory stochastic processes will be covered. This course is intended for statistics students and interested students from other disciplines who have appropriate previous courses in statistics. Information on particular offerings will be available at the beginning of each academic year. (Offered in odd-numbered years.)

*Prerequisite(s):* STAT\*3110, STAT\*3240

**STAT\*4060 Topics in Applied Statistics II F (3-0) [0.50]**

Same as for STAT\*4050. (Offered in even-numbered years.)

*Prerequisite(s):* STAT\*3110, STAT\*3240

**STAT\*4340 Statistical Inference W (3-0) [0.50]**

This course reviews and extends the theory of estimation introduced in STAT\*3110. Topics including point estimation, interval estimation, hypothesis testing and decision theory will be presented from both the frequentist and likelihood-based perspectives. Foundational issues concerning the frequentist and Bayesian paradigms will also be discussed.

*Prerequisite(s):* STAT\*3110, STAT\*3240

**STAT\*4350 Applied Multivariate Statistical Methods F (3-0) [0.50]**

This course introduces the multivariate normal, and Wishart and Hotelling's T-square distributions. Topics covered include: statistical inference on the mean vector, canonical correlation, multivariate analysis of variance and covariance, multivariate regression, principal components analysis, and factor analysis. Topics will be illustrated using examples from various disciplines.

*Prerequisite(s):* (MATH\*2150 or MATH\*2160), STAT\*3110, STAT\*3240

**STAT\*4360 Applied Time Series Analysis W (3-2) [0.50]**

This course will investigate the nature of stationary stochastic processes from the spectral and time domain points of view. Aspects of parameter estimation and prediction in a computationally intensive environment will be the presentation style. The methods developed in this course will have applicability in many sciences such as engineering, environmental sciences, geography, soil sciences, and life sciences.

*Prerequisite(s):* STAT\*3240 or instructor consent

**STAT\*4600 Advanced Research Project in Statistics F,W (0-6) [1.00]**

Each student in this course will undertake an individual research project in some area of statistics, under the supervision of a faculty member. A written report and a public presentation of the project will be required.

*Restriction(s):* Approval of a supervisor and the course coordinator.

## Studio Art

### School of Fine Art and Music

Admission to all Studio Art courses is based on the university's policy with regard to Priority Access Courses. Admission to ALL Studio Courses at the 3000-level and above is restricted to students who:

1. are currently registered in the Art History or Studio Art Specializations of the Bachelor of Arts Program;
2. have an average of 70% in all ARTH and SART course attempts;
3. have completed both ANTH\*1220 , ANTH\*1520 , SART\*1050 and SART\*1060.

Studio supplies: The majority of the cost of supplies must be borne by the student. In order to permit the University to subsidize this cost and to allow for savings through discount buying, some materials are obtained through the School of Fine Art and Music by payment of a lab fee. The amount of the fee is established for each semester prior to registration.

Note: Due to limited faculty resources and facilities, enrolment in these courses may be restricted to Studio Art majors or minors.

#### SART\*1050 Foundation Studio F,W (2-4) [0.50]

This course provides a foundation in the technical and theoretical aspects of contemporary two-dimensional media. Through a combination of lectures, studio projects and guest speakers the students will explore perceptual, conceptual and topical dimensions of art making practices.

**Restriction(s):** Registration in semesters one, two, three or four. May not register in SART\*1060 in same term. This is a Priority Access course. Enrolment may be restricted to particular programs or specializations during certain periods. Please see the departmental website for more information.

#### SART\*1060 Core Studio F,W (2-4) [0.50]

This course provides a foundation in the technical and theoretical aspects of contemporary three-dimensional and time-based media. Through a combination of lectures, studio projects and guest speakers, students will explore perceptual, conceptual and topical dimensions of contemporary art making practices.

**Restriction(s):** Registration in semesters one, two, three or four. May not register in SART\*1050 in same term. This is a Priority Access course. Enrolment may be restricted to particular programs or specializations during certain periods. Please see the departmental website for more information.

#### SART\*1150 Contemporary Artistic Practice S,W (3-0) [0.50]

This course, which uses a web-based platform, is an introduction to contemporary art and artists. Lectures will be augmented by studio art assignments and online discussions in order to develop an understanding of material covered in the course. (Offered through Distance Education only.)

#### SART\*2090 Drawing I F,W (0-6) [0.50]

This course is an introduction to the basic concepts, techniques and media of drawing, through disciplined observational and imaginative study.

**Prerequisite(s):** ARTH\*1220, ARTH\*1520, SART\*1050, SART\*1060; (ARTH\*1220 and SART\*1060 can be taken as co-requisites.)

#### SART\*2200 Painting I F,W (0-6) [0.50]

This course introduces various technical and aesthetic issues of painting, with an emphasis placed on representational strategies. Diverse approaches will be investigated through specific studio assignments in acrylic and oil-based media on various painting supports. Prior or concurrent Drawing classes are recommended.

**Prerequisite(s):** ARTH\*1220, ARTH\*1520, SART\*1050, SART\*1060; (ARTH\*1220 and SART\*1060 can be taken as co-requisites.)

#### SART\*2300 Sculpture I F,W (0-6) [0.50]

This course is an introduction to contemporary sculptural concerns through projects and readings. Students will be actively engaged in exploring a variety of materials and ideas including modular construction, casting, and scale exercises.

**Prerequisite(s):** ARTH\*1220, ARTH\*1520, SART\*1050, SART\*1060; (ARTH\*1220 and SART\*1050 can be taken as co-requisites.)

#### SART\*2460 Introductory Printmaking I F (0-6) [0.50]

This course is an introduction to the traditional printmaking media of intaglio and relief printing.

**Prerequisite(s):** ARTH\*1220, ARTH\*1520, SART\*1050, SART\*1060; (ARTH\*1220 and SART\*1060 can be taken as co-requisites.)

#### SART\*2470 Introductory Printmaking II W (0-6) [0.50]

This course is an introduction to the techniques of the traditional printmaking media of lithography and silkscreen.

**Prerequisite(s):** ARTH\*1220, ARTH\*1520, SART\*1050, SART\*1060; (ARTH\*1220 and SART\*1060 can be taken as co-requisites.)

#### SART\*2610 Photography I F,W (0-6) [0.50]

This course is an introduction to the creative application of photography in art, and the basic principles of traditional photo-chemical and digital photography.

**Prerequisite(s):** ARTH\*1220, ARTH\*1520, SART\*1050, SART\*1060; (ARTH\*1220 and SART\*1060 can be taken as co-requisites.)

#### SART\*2700 Introduction to Computer Graphics F (0-6) [0.50]

This course extends the conceptual, technical, and aesthetic issues of studio art into the field of computer arts. Some computer experience is recommended.

**Prerequisite(s):** ARTH\*1220, ARTH\*1520, SART\*1050, SART\*1060; (ARTH\*1220 and SART\*1060 can be taken as co-requisites.)

#### SART\*2710 Drawing Graphics on the Computer W (0-6) [0.50]

This course introduces digital drawing on the computer, translating traditional media into complex vector graphics. Some computer experience is recommended.

**Prerequisite(s):** ARTH\*1220, ARTH\*1520, SART\*1050, SART\*1060; (ARTH\*1220 and SART\*1060 can be taken as co-requisites.)

#### SART\*2800 Extended Practices I F,W (0-6) [0.50]

This course introduces contemporary studio concerns with emphasis on an interdisciplinary approach to art production. Students will be actively engaged in exploring a variety of skills, materials and ideas including video, audio, artist multiples, site work and concept art. These skill sets provide a solid base for upper level courses, where thematic projects encourage students to choose the most appropriate medium for their approach beyond a singular discipline or particular medium.

**Prerequisite(s):** ARTH\*1220, ARTH\*1520, SART\*1050, SART\*1060; (ARTH\*1220 and SART\*1050 can be taken as co-requisites.)

#### SART\*3090 Drawing II F,W (0-6) [0.50]

An extension of SART\*2090 which attempts to foster understanding of the basic skills and technical issues necessary to the making of drawings while introducing the philosophical and critical issues related to the discipline.

**Prerequisite(s):** ARTH\*1220, ARTH\*1520, SART\*1050, SART\*1060, SART\*2090  
**Restriction(s):** Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

#### SART\*3200 Painting II F,W (0-6) [0.50]

This course is an extension of the work begun in SART\*2200. The various technical and aesthetic issues of representational painting will be further investigated as will the diverse approaches to pictorial organization derived from observation. However, the issues of abstraction and other forms of non-representational approaches will be introduced and developed in a deeper and fuller attempt to explore the possibilities available to the contemporary painter.

**Prerequisite(s):** ARTH\*1220, ARTH\*1520, SART\*1050, SART\*1060, SART\*2200  
**Restriction(s):** Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

#### SART\*3300 Sculpture II F,W (0-6) [0.50]

This is a technical course in which specific tools of the wood and metal shops will be studied in depth through assignments. Conceptual issues will be examined in relation to the creation of objects.

**Prerequisite(s):** ARTH\*1220, ARTH\*1520, SART\*1050, SART\*1060, SART\*2300  
**Restriction(s):** Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

#### SART\*3410 Intaglio F (0-6) [0.50]

This is an in-depth investigation into aspects of intaglio printmaking.

**Prerequisite(s):** ARTH\*1220, ARTH\*1520, SART\*1050, SART\*1060, (SART\*2460 or SART\*2470)  
**Restriction(s):** Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

#### SART\*3450 Lithography F (0-6) [0.50]

This is an in-depth exploration of the art of lithography.

**Prerequisite(s):** ARTH\*1220, ARTH\*1520, SART\*1050, SART\*1060, (SART\*2460 or SART\*2470)  
**Restriction(s):** Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.



**SART\*3470 Photo-Printmaking W (0-6) [0.50]**

This course investigates the uses of photographic resources in image making to produce photo etchings, silk-screens, and lithographs, as well as the use of computer graphics to augment the design process. (Offered in odd-numbered years.)

*Prerequisite(s):* ARTH\*1220, ARTH\*1520, SART\*1050, SART\*1060, (SART\*2460 or SART\*2470)

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*3480 Web Development and Design F (0-6) [0.50]**

This course is an in-depth study of website design using professional web authoring software. Students will design and create a website which explores a contemporary issue in their art practice.

*Prerequisite(s):* ARTH\*1220, ARTH\*1520, SART\*1050, SART\*1060, (SART\*2700 or SART\*2710)

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*3600 Digital & Non-Silver Photography F (0-6) [0.50]**

This course combines non-silver, photo-chemical and digital photographic methods as an expansion of photographic concepts introduced in SART\*2610. These techniques will serve as the basis for aesthetic investigation into the formal, conceptual, technical and theoretical issues related to historic and new technologies in photographic practice.

*Prerequisite(s):* ARTH\*1220, ARTH\*1520, SART\*1050, SART\*1060, SART\*2610

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*3750 Photography II F,W (0-6) [0.50]**

This course is a further exploration of expressive, formal and technical aspects of photography.

*Prerequisite(s):* ARTH\*1220, ARTH\*1520, SART\*1050, SART\*1060, SART\*2610

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*3770 Extended Practices II F,W (0-6) [0.50]**

Thematically based projects encourage students to choose the most appropriate medium or combination of media for each assignment. Students may pursue and perfect one medium or take a more interdisciplinary approach (artists multiples, installation, performance, video, alternative venues, relational art or a combination of approaches).

*Prerequisite(s):* ARTH\*1220, ARTH\*1520, SART\*1050, SART\*1060, SART\*2800

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*3800 Experiential Learning I F,W (0-6) [0.50]**

This is an independent study course based on either Studio Art-related voluntary or paid practical experience. Evaluation will be based on assignments related to work duties. Written proposals, signed by the instructor, must be submitted to the Director for the School for approval by the last day of course selection in the Fall (for Winter) or Winter (for the following Fall).

*Prerequisite(s):* 3.00 credits in Studio Art

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts. Instructor consent required.

**SART\*3900 Experiential Learning II F,W (0-6) [0.50]**

This course provides students with an opportunity to continue the workplace or activity begun in SART\*3800 in greater depth, or to experience a new work/study situation. Evaluation will be based on assignments related to work duties. Written proposals, signed by the instructor, must be submitted to the Director for the School for approval by the last day of course selection in the Fall (for Winter) or Winter (for the following Fall) semester.

*Prerequisite(s):* SART\*3800 and 3.50 credits in Studio Art

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations with an average of 80% in all ARTH and SART course attempts. Instructor consent required.

**SART\*4090 Drawing III F (0-6) [0.50]**

This course will study the technical development of observational drawing as well as the experimental and intentional development of drawing as a contemporary artform.

*Prerequisite(s):* SART\*3090

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*4130 Drawing IV W (0-6) [1.00]**

This is an advanced course which explores drawing through individually oriented production supported by critical study of diverse contemporary approaches to the medium.

*Prerequisite(s):* SART\*4090

**SART\*4200 Painting III F (0-6) [0.50]**

A further extension of the work begun in SART\*2200 and SART\*3200. While the various technical and aesthetic issues will continue to be investigated through the discipline of observational painting there will be more emphasis on the critical issues relevant to contemporary painting and allowance for personal expression through both abstract and representational modes.

*Prerequisite(s):* SART\*3200,

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*4230 Special Topics in Painting W (0-6) [0.50]**

An advanced course which focuses on a specific theme, subject, or technique in painting. Topics may include the figure and narrative in painting, the landscape in contemporary painting, or New Abstraction.

*Prerequisite(s):* SART\*3200

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*4240 Painting IV W (0-6) [1.00]**

This course offers advanced investigations into the theory and practice of painting, with strong emphasis on the development of a critically informed and engaged individual practice.

*Prerequisite(s):* SART\*4200 or SART\*4230

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*4300 Sculpture III F,W (0-6) [0.50]**

Contemporary issues in sculpture will be addressed through at least 2 studio projects including 1 site-response installation, and an independent work in close consultation with the instructor. Interdisciplinary projects based on the students' own research are strongly encouraged.

*Prerequisite(s):* SART\*3300

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*4330 Senior Sculpture F,W (0-6) [1.00]**

In close consultation with the instructor, the student will produce a body of independent sculpture with attention to clarity of personal statement, originality, and professionalism. Interdisciplinary projects based on the students' own research are strongly encouraged.

*Prerequisite(s):* SART\*4300

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*4410 Experimental Printmaking W (0-6) [0.50]**

This course will further investigate traditional and photo based printing media. Computer graphics will be used to augment the design process.

*Prerequisite(s):* 3 of SART\*2460, SART\*2470, SART\*3410, SART\*3450, SART\*3470

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*4470 Advanced Printmaking W (0-6) [1.00]**

This course is an in-depth study of various printmaking media including the use of computer graphics and advanced manipulation of photo based images to create a personal portfolio of thematically coherent prints. Seminar presentation is required.

*Prerequisite(s):* SART\*4410

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*4660 Topics in Extended Practices F (0-6) [0.50]**

For this advanced course, the specific theme, subject, or technique in extended practices will vary according to the instructor or instructors and will consist of topics not otherwise available in the curriculum. Topics may include Performance Art, Installation, Interactive Art, Relational Art, Alternative Venues and Artists Multiples.

*Prerequisite(s):* SART\*3770

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*4670 Topics in Extended Practices F (0-6) [0.50]**

For this advanced course, the specific theme, subject, or technique in extended practices will vary according to the instructor or instructors and will consist of topics not otherwise available in the curriculum. Topics may include Performance Art, Installation, Interactive Art, Relational Art, Alternative Venues and Artists Multiples.

*Prerequisite(s):* SART\*3770

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*4700 Photography III F,W (0-6) [0.50]**

This course is a continued investigation into the formal, technical and theoretical issues of contemporary photography, with an emphasis on colour photography.

*Prerequisite(s):* SART\*3600 or SART\*3750

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*4720 Photography IV W (0-6) [1.00]**

Through close consultation with the instructor, the student will continue advanced black and white, colour, mural printing, non-silver or digital photographic investigations towards producing an independent body of work. Opportunities for interdisciplinary approaches to photographic practice and the awareness of personal working methodologies will be encouraged.

*Prerequisite(s):* SART\*4700

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*4750 Specialized Studio Practice I F (0-6) [1.50]**

This is an advanced and specialized course in individual studio work, which affords students opportunities for interdisciplinary and collaborative approaches and oversees the development of independent study strategies. Students will research and complete a major self-directed project. This course is not intended for all Honours students. This course is intended to assist in the preparation for graduate school and professional activities in the Arts.

*Prerequisite(s):* A minimum of 2 courses at the 4000-level in Studio Arts, a minimum cumulative average of at least 80% in SART courses and ARTH courses.

*Restriction(s):* Permission of the Instructor or Director of the School.

**SART\*4760 Specialized Studio Practice II W (0-6) [1.50]**

This course is a continuation of SART\*4750.

*Prerequisite(s):* A minimum of 2 courses at the 4000-level in Studio Arts, a minimum cumulative average of at least 80% in SART courses and ARTH courses.

*Restriction(s):* Permission of the Instructor or Director of the School.

**SART\*4800 Special Topics in Sculpture W (0-6) [0.50]**

This is an advanced course which focuses on a specific theme, subject, or technique in sculpture. Subject matter will vary according to the instructor or instructors and will consist of topics not otherwise available in the curriculum. Topics may include, for example, Kinetic Media, Public Art, Mold Making, or Figuration and Installation. Normally, two different topics will be offered each year (see SART\*4870).

*Prerequisite(s):* SART\*3300

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*4810 Extended Practices III W (0-6) [0.50]**

Contemporary issues in interdisciplinary art production will be addressed through at least two thematic projects and one self-directed work based on the students' own research in close consultation with the instructor. Students may choose to pursue and perfect one medium, or take a more interdisciplinary approach to art production.

*Prerequisite(s):* 1 of SART\*3770, SART\*4660, SART\*4670

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*4870 Special Topics in Sculpture W (0-6) [0.50]**

This is an advanced course which focuses on a specific theme, subject, or technique in sculpture. Subject matter will vary according to the instructor or instructors and will consist of topics not otherwise available in the curriculum. Topics may include, for example, Kinetic Media, Public Art, Mold Making, or Figuration and Installation. Normally, two different topics will be offered each year (see SART\*4800).

*Prerequisite(s):* SART\*3300

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*4880 Extended Practices IV W (0-6) [1.00]**

In close consultation with the instructor, students produce two self-directed projects based on their own research. Presentations, grants, writing and composing artist statements will provide students the opportunity to develop personal conviction and a professional approach to Studio Art practice.

*Prerequisite(s):* 1 of SART\*4660, SART\*4670, SART\*4810

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

**SART\*4890 Interactive Multimedia W (0-6) [1.00]**

This course explores the online multimedia world of the Internet. Students will use professional authoring and imaging software to create multimedia presentations which explore contemporary art issues. Seminars will examine cultural and theoretical issues brought about by the spread of digital communication through the Internet.

*Prerequisite(s):* SART\*3480

*Restriction(s):* Registration is limited to students registered in the Art History or Studio Art specializations of the Bachelor of Arts program with an average of 70% in all ARTH and SART course attempts.

## Theatre Studies

### *School of English and Theatre Studies*

*NOTES: Admission to the following courses is not guaranteed, and is by audition, submission of a portfolio and/or interview only:*

THST*3110	[0.50]	Acting II
THST*3120	[0.50]	Acting III
THST*3410	[0.50]	Special Studies in Production I
THST*3420	[0.50]	Special Studies in Production II
THST*3600	[0.50]	Directed Readings and Special Independent Studies
THST*3620	[0.50]	Special Studies Seminar
THST*3630	[0.50]	Special Studies in Studio Practice
THST*4090	[0.50]	Directing
THST*4250	[0.50]	Honours Project in Theatrical Production
THST*4650	[0.50]	Honours Essay

*For times and dates of auditions, interviews, or the deadline for applications, students should consult the School. All students applying for entry to these courses must obtain the signature of the Theatre Studies Program advisor or the Director, who will admit students only after consultation with the instructor.*

Iterations of some courses may include field trips for which there are supplemental fees.

*The Theatre Studies program has a particular interest in the drama and theatre of Canada. Course offerings will reflect this concentration where appropriate.*

### **THST\*1040 Introduction to Theatre Studies F,W (3-0) [0.50]**

This course introduces students to the disciplines and subject areas that constitute Theatre Studies at the university level, including the work of playwrights, directors, designers, actors and technicians in creating productions, and the scholarly study of theatrical history, theory and dramatic literature. Attendance at a number of performances is required, since these performances are among the "texts" for the course.

*Equate(s):* DRMA\*1000

### **THST\*1150 Seminar in Theatre Studies W (3-0) [0.50]**

A focused study of a selected topic in a small-group learning experience. Students will be introduced to research methodologies and offered opportunities to strengthen their writing and speaking skills. Variable course content. Consult the School's website for current topics.

*Restriction(s):* Restricted to students who are declared majors in Theatre Studies.

### **THST\*1200 The Languages of Media F (3-2) [0.50]**

This introductory course examines film, radio, television, and digital media, focusing on the codes and conventions used by different media to create relationships between structure and content, to make meaning.

### **THST\*2010 Theatre Historical Studies F (3-0) [0.50]**

This course will introduce students to the historical study of theatre by surveying developments in Western theatre from the classical period to twentieth-century modernism. Building on the historicity of Western theatre, the course also considers the historical conditions that have produced contemporary theatre practice in Canada.

*Prerequisite(s):* THST\*1040

*Equate(s):* DRMA\*2300 , DRMA\*3180

### **THST\*2080 Acting I F,W (2-3) [0.50]**

This is a studio course for students applying classroom theory to acting problems.

*Prerequisite(s):* THST\*1040

*Equate(s):* DRMA\*2080

### **THST\*2120 Dramaturgy and Playwriting W (3-0) [0.50]**

Students will study how plays are made. The course includes analysis of theatrical texts and exercises in scripting.

*Prerequisite(s):* THST\*1040

*Equate(s):* DRMA\*1050

### **THST\*2230 Intro to Technical Theatre F,W (2-3) [0.50]**

An introduction to the theory and practice of theatrical production, including sets, costumes, lighting, sound, props and technical drawing. Students are expected to serve on technical crews on some evenings and weekends during School productions.

*Prerequisite(s):* DRMA\*1000 or THST\*1040

*Equate(s):* DRMA\*2220

### **THST\*2240 Introduction to Theatre Design W (2-3) [0.50]**

Students will be introduced to theories, techniques and materials in five areas of theatrical design: sets, props, lighting, sound, and costume. The course also considers the history of design for the theatre, attending to the relationship between design and other forms of cultural expression.

*Prerequisite(s):* DRMA\*1000 or THST\*1040

*Equate(s):* DRMA\*2220

### **THST\*2450 Approaches to Media Studies W (3-0) [0.50]**

This course examines major approaches to the study of communication, including cybernetic, anthropological, semiotic and other perspectives, focusing on how people transmit information and construct meaning. (Offered in even-numbered years.)

*Prerequisite(s):* THST\*1200

### **THST\*2500 Contemporary Cinema W (2-3) [0.50]**

The course is designed to give the student knowledge and understanding of contemporary cinematic expression.

*Equate(s):* DRMA\*2500

### **THST\*2650 History of Communication F (3-0) [0.50]**

This course is organized around several revolutions in communication and technology: the evolution of human language; the development of writing systems and literacy; the invention and spread of printing and typography; and the beginnings of electronic communication and the digital revolution. (Offered in odd-numbered years.)

*Prerequisite(s):* THST\*1200

### **THST\*3030 Theatre for Young Audiences U (2-2) [0.50]**

This is a studio course addressing selected topics dealing with theatrical practice for children and/or adolescents such as: creating theatre for young audiences; theatre as an instructional tool; teaching theatre to children; theatre games and play.

*Prerequisite(s):* 10 credits

*Equate(s):* DRMA\*2400

*Restriction(s):* Students must be enrolled as a Major or Minor or area of concentration in Theatre Studies or B.A.Sc. Child, Youth and Family.

### **THST\*3080 Acting Studio F,W (2-3) [0.50]**

A studio course in acting that will address particular issues and techniques, and may conclude with a small-scale production.

*Prerequisite(s):* THST\*2080

*Equate(s):* DRMA\*3080

### **THST\*3100 Screenwriting W (3-0) [0.50]**

Students will be introduced to and be assessed on the various phases of the process of developing a film script, including developing a one-minute screenplay without dialogue; a five minute screenplay with dialogue; a strategy for "pitching" an idea to a producer; and the final script. Students will also conduct research on film scholarship and film reception, to contextualize their own writing. (Offered in even-numbered years.)

*Prerequisite(s):* 1.00 credits from THST\*1200, THST\*2080, THST\*2120, THST\*2240

*Restriction(s):* DRMA\*3620 , THST\*3620

### **THST\*3110 Acting II F,W (2-3) [0.50]**

A continuation of THST\*2080. Students will perform in a public production. Admission is by audition only.

*Prerequisite(s):* THST\*2080

*Equate(s):* DRMA\*3110

*Restriction(s):* Instructor consent required.

### **THST\*3120 Acting III F,W (2-3) [0.50]**

A continuation of THST\*3110. Students will perform in a public production. Admission is by audition only.

*Prerequisite(s):* THST\*3110

*Equate(s):* DRMA\*3120

*Restriction(s):* Instructor consent required.

### **THST\*3220 Technical Production I F,W (2-3) [0.50]**

This course offers students advanced engagement with the theory and application of theatrical crafts, and includes work in a technical capacity on a School production.

*Prerequisite(s):* DRMA\*2220 or THST\*2230

*Equate(s):* DRMA\*3220

### **THST\*3230 Technical Production II F,W (2-3) [0.50]**

A continuation of THST\*3220, focusing on the theory and application of theatrical crafts, and including work in a technical capacity on a School production. Students will normally work in different capacities in THST\*3220 and THST\*3230.

*Prerequisite(s):* THST\*3220

*Equate(s):* DRMA\*3230

### **THST\*3240 Theatrical Organization F (3-0) [0.50]**

A study of various models of theatrical organization such as theatrical funding, board and management structures, production management, technical direction, and stage management, together with their implications for theatrical production and interpretation. (Offered in even-numbered years.)

*Prerequisite(s):* THST\*2010, THST\*2230

*Equate(s):* DRMA\*3240

**THST\*3260 Shakespeare: Text & Performance S (3-0) [0.50]**

The course offers an analysis of a selection of plays by William Shakespeare. In addition to textual analysis, the students will be introduced to the stage history of the plays being considered, with attention to conditions of production. The course normally will include consideration of plays by Shakespeare which are currently in production at the Stratford Festival; students will have the opportunity to see the plays in performance for which an additional fee may be charged. The course is taught as an intensive seminar in conjunction with the Stratford Festival and is offered in Stratford, Ontario.

*Prerequisite(s):* 2.50 credits in Theatre Studies including THST\*2010 or 1.00 credits in English.

**THST\*3280 Theatrical Space W (3-0) [0.50]**

This course is a study of theatrical space as it shapes performance, reception, social value and cultural meanings. It explores the nature of performance spaces and the relationship between performer and audience, and considers theoretical approaches to the problem of theatrical space, including analyses of cultural location, aesthetic spatiality, public space and kinaesthetic space. The course offers an historical overview of various theatre and non-theatre venues for performance from the perspectives of actors, directors, designers, technicians and audiences. (Offered in even-numbered years.)

*Prerequisite(s):* THST\*2010, THST\*2230

**THST\*3300 Sexuality and The Stage F (3-0) [0.50]**

This course focuses on issues relating to the staging of sexuality. The course will theorize and historicize the representation of sexual diversity. Variable content course. Topics may include, for example, the theatrical staging of gays, lesbians, bisexuals, and transgendered people; queer theatre; and the privileging of heterosexuality on the stage. (Offered in even-numbered years.)

*Prerequisite(s):* THST\*2010 or 1.00 credits in English

**THST\*3340 Voice and Text in Performance S (0-6) [0.50]**

Within a studio context, students are introduced to techniques of voice, particularly in relation to performing verse. The course is taught as an intensive lab in conjunction with the Stratford Festival and is offered in Stratford, Ontario. The course may involve a lab fee. Admission to the course is by application to the School of English and Theatre Studies. Further information is available from the School.

*Prerequisite(s):* 2.50 credits in Theatre Studies including THST\*3080 or THST\*3110

*Co-requisite(s):* THST\*3260

**THST\*3360 Political Intervention Theatre W (3-0) [0.50]**

This course examines major theories, practices and textualities of radical theatre interventions in politics in the twentieth- and twenty-first centuries. It traces the historical development and genealogies of interventionist processes, with particular attention to the transnational circulation of practices and methods. (Offered in even-numbered years.)

*Prerequisite(s):* THST\*2010 or 1.00 credits in English

**THST\*3410 Special Studies in Production I F,W (2-3) [0.50]**

Students will serve in such capacities as stage managers, assistant stage managers, assistant directors, assistant designers, dramaturges, producers, or publicists on School productions, and will study the functions of these roles in theatrical production. Admission is by application to the School.

*Prerequisite(s):* THST\*3220, (1 of THST\*2120, THST\*3240, THST\*3430, THST\*3460, THST\*3480, THST\*3700)

*Equate(s):* DRMA\*3410

*Restriction(s):* Instructor consent required.

**THST\*3420 Special Studies in Production II F,W (2-3) [0.50]**

A continuation of THST\*3410. Students will normally work in different capacities in THST\*3410 and THST\*3420. Admission is by application to the School.

*Prerequisite(s):* THST\*3410

*Equate(s):* DRMA\*3420

*Restriction(s):* Instructor consent required.

**THST\*3430 Theatrical Design: Sets & Props F (2-3) [0.50]**

This course provides a study of the history, theory, and practice of theatrical design, with focus on the principles of set and prop design. (Offered in even-numbered years.)

*Prerequisite(s):* DRMA\*2220 or (THST\*2230, THST\*2240)

*Equate(s):* DRMA\*3430

**THST\*3460 Costume W (2-3) [0.50]**

This course studies the art of costume design for the theatre, placing the discipline in historical and theoretical contexts while exploring the practice and art of costume design. The course covers the techniques, materials and language necessary to the costume designer's craft and role in the production of a work of theatre. At the instructor's discretion, the course may include the design of mask, makeup, wigs and accessories. (Offered in odd-numbered years.)

*Prerequisite(s):* THST\*2230, THST\*2240

*Restriction(s):* DRMA\*3440

**THST\*3480 Lighting, Sound, Theatre Media F (2-3) [0.50]**

The course studies theatrical lighting, sound, and media from the perspective of the designer. Through a combination of class instruction, demonstration and practical lab projects, the student will follow the process for the design of light, sound and media (theory and practice), from the first reading of a script through all of the stages that lead to the creation of a design. Special attention is given to analyzing scripts for visual and aural images. (Offered in odd-numbered years.)

*Prerequisite(s):* THST\*2230, THST\*2240

*Restriction(s):* DRMA\*3440

**THST\*3530 Canadian Film F (2-3) [0.50]**

This course is designed to give the student knowledge and understanding of Canadian film and film makers. (Offered in even-numbered years.)

*Prerequisite(s):* THST\*1200 or DRMA\*1500

*Equate(s):* DRMA\*3530

**THST\*3540 World Theatre Cultures U (3-0) [0.50]**

This course presents a focused study of theatrical traditions and dramatic practices (largely) outside European traditions. Variable content course. Consult the School's website for current topics.

*Prerequisite(s):* (THST\*2010, THST\*2120) or 1.50 credits in English

**THST\*3550 Theories of Drama and Theatre W (3-0) [0.50]**

This course covers selected theoretical approaches to the study of drama and theatre.

*Prerequisite(s):* THST\*2010, (1 or THST\*2080, THST\*2120, THST\*2240)

*Equate(s):* DRMA\*3550

**THST\*3600 Directed Readings and Special Independent Studies U (3-0) [0.50]**

Independent study based upon bibliographies established in consultation with the instructor. An essay will normally constitute the written requirement for the course. Tutoring and/or consultation will be arranged, depending on the topic or materials for study. Special studies may also be arranged in the practical aspects of the theatre, with appropriate assignments, not leading to a production. Projects for this course are subject to the approval of the School, and must be submitted to the Director, on forms provided by the School, no later than the last day of classes in the semester prior to enrolment in the course.

*Prerequisite(s):* 3.00 credits in Theatre Studies including THST\*2010, THST\*2230, (1 of THST\*2080, THST\*2120, THST\*2240)

*Equate(s):* DRMA\*3600

*Restriction(s):* Instructor consent required.

**THST\*3620 Special Studies Seminar U (3-0) [0.50]**

This seminar course provides for intensive study of a specific aspect of drama and/or theatre.

*Prerequisite(s):* 3.00 credits in Theatre Studies.

*Equate(s):* DRMA\*3620

*Restriction(s):* Instructor consent required.

**THST\*3630 Special Studies in Studio Practice U (3-0) [0.50]**

The course provides an intensive exploration of one aspect of studio practice: playwriting, acting, design or technical theatre.

*Prerequisite(s):* 3.00 credits in Theatre Studies including one of the following, as appropriate to the topic of the course: THST\*2080, THST\*2120, THST\*2230, THST\*2240.

*Equate(s):* DRMA\*3630

*Restriction(s):* Instructor consent required.

**THST\*3650 Theatre Historical Studies Seminar F (3-0) [0.50]**

This seminar course investigates a topic in theatre history. The course will further develop students' research skills and expertise in writing and speaking about scholarly materials in the discipline. Variable content course.

*Prerequisite(s):* THST\*2010, DRMA\*2300

*Equate(s):* DRMA\*4300

**THST\*3660 Dramatic Literature and Theory Seminar W (3-0) [0.50]**

This seminar course investigates an area of dramatic literature. The course will develop students' research skills and writing and speaking about scholarly materials in the discipline. Variable course content.

*Prerequisite(s):* THST\*2010 or DRMA\*2300

**THST\*3700 Fundamentals of Directing W (2-3) [0.50]**

This course is a study of the basic theories of directing, complemented by practical in-class directing exercises.

*Prerequisite(s):* ( DRMA\*1050 or THST\*2120), THST\*2080

*Equate(s):* DRMA\*3700

**THST\*3850 Canadian Drama and Theatre F (3-0) [0.50]**

This course is a study of Canadian plays in their historical, cultural, and theatrical contexts.

*Prerequisite(s):* ( DRMA\*2300 or THST\*2010) or 1.00 credits in English.

*Equate(s):* DRMA\*3850

*Restriction(s):* DRMA\*3331/2

**THST\*3950 Drama in London U (2-4) [0.50]**

A course designed for students taking the London Semester consisting of a study of theatre events in London, through attending performances, reading texts and meeting for weekly seminars.

*Equate(s):* DRMA\*3950

*Restriction(s):* Permission of the Co-ordinator of the London Semester.

**THST\*4090 Directing F (3-2) [0.50]**

The application of the fundamentals of directing through a specific directorial assignment. Admission is by application to the School.

*Prerequisite(s):* THST\*3700

*Equate(s):* DRMA\*4090

*Restriction(s):* Instructor consent required.

**THST\*4250 Honours Project in Theatrical Production F,W (0-6) [0.50]**

The completion, under direction, of a project in acting, directing, dramaturgy, design or technical theatre.

*Prerequisite(s):* THST\*2010, THST\*2230, (1 of DRMA\*3440 , THST\*3110, THST\*3220, THST\*3430, THST\*3480, THST\*3700). Admission is by application to the School.

*Equate(s):* DRMA\*4250

*Restriction(s):* Consent of both the instructor and the School are required.

**THST\*4280 Ensemble Project W (6-9) [1.50]**

Students will engage throughout the semester with the processes of forming a theatre company, theorizing its organizational structure, exploring fundraising and publicity exercises, casting, designing, dramaturging, directing, and mounting a production, and engaging in post-production analysis that assesses the social and theatrical impact of the decisions taken and procedures employed.

*Prerequisite(s):* THST\*1040, THST\*2010, THST\*2230, (2 of THST\*2080, THST\*2120, THST\*2240), THST\*3550, THST\*3850, (THST\*3650 or THST\*3660)

*Restriction(s):* Restricted to majors in Theatre Studies who have completed a minimum of 14.00 credits.

**THST\*4320 Seminar in Dramatic Literature and Theory F (3-0) [0.50]**

An in depth study of one aspect of dramatic literature written before 1900.

*Prerequisite(s):* (THST\*3650 or THST\*3660), THST\*3850

*Equate(s):* DRMA\*4320

**THST\*4330 Seminar in Canadian Drama and Theatre W (3-0) [0.50]**

An in depth study of one aspect of Canadian drama and theatre.

*Prerequisite(s):* (THST\*3650 or THST\*3660), THST\*3550, THST\*3850

*Equate(s):* DRMA\*4330

**THST\*4340 Playwriting F (3-0) [0.50]**

This course is a study of the theory and practice of playwriting.

*Prerequisite(s):* (THST\*3650 or THST\*3660), THST\*3850

*Equate(s):* DRMA\*4340

**THST\*4650 Honours Essay U (3-0) [0.50]**

The completion, under direction, of a scholarly essay in the study of drama and/or theatre. Admission is by application to the instructor.

*Prerequisite(s):* (THST\*3650 or THST\*3660), THST\*3550, THST\*3850

*Equate(s):* DRMA\*4650

*Restriction(s):* Instructor consent required.

## Toxicology

Department of Biomedical Sciences

Department of Chemistry

School of Environmental Sciences

Department of Mathematics and Statistics

Department of Molecular and Cellular Biology

Department of Pathobiology

### **TOX\*2000 Principles of Toxicology F (3-0) [0.50]**

This course will establish the scientific principles underlying the toxic actions of various substances and will introduce the various challenges within the field of toxicology. The chemical nature of injurious substances, their uptake and metabolism by non-target organisms, and their mode of toxic action will be studied in addition to the methods used in safety evaluations and risk assessment. Department of Biomedical Sciences.

*Prerequisite(s):* (CHEM\*1050 or CHEM\*2300 ), (MATH\*1080 or equivalent), (BIOL\*1040 or BIOL\*1080) ( CHEM\*2300 may be taken concurrently)

### **TOX\*3300 Analytical Toxicology F (3-3) [0.50]**

A course in trace analysis designed for students in toxicology and related programs. Analytical techniques of value in analyzing samples of toxicological importance will be presented with emphasis also on sample collection and preparation prior to analysis. Department of Chemistry.

*Prerequisite(s):* CHEM\*2480, BIOC\*2580, TOX\*2000 (TOX\*2000 may be taken concurrently)

*Restriction(s):* CHEM\*3430, CHEM\*3450 Priority Access course. Enrolment may be restricted to particular programs or specializations. See department for more information.

### **TOX\*3360 Environmental Chemistry and Toxicology S,W (3-0) [0.50]**

This course examines the chemistry of the natural environment and the influence of pollutants upon the environment. Topics will include methods of introduction of pollutants to, and removal of pollutants from, the environment. Department of Chemistry. (Also listed as CHEM\*3360.) (Also offered in Distance Education format.)

*Prerequisite(s):* CHEM\*1050

*Equate(s):* CHEM\*3360

### **TOX\*4000 Medical Toxicology F (4-0) [0.50]**

This course will focus on the toxicology of mammalian body systems with emphasis on dose-response, mechanisms and the sites of action of major groups of chemical toxicants and biological toxins. The course is designed for students majoring in Bio-Medical Sciences and Toxicology. Department of Biomedical Sciences.

*Prerequisite(s):* BIOM\*3090

### **TOX\*4100 Toxicological Pathology W (2-2) [0.50]**

Evaluation of the pathologic responses of cells and tissues to toxic compounds. The course is designed for students majoring in toxicology. Department of Pathobiology.

*Prerequisite(s):* PATH\*3610 (or equivalent)

### **TOX\*4200 Topics in Toxicology W (0-4) [0.50]**

Topics in toxicology will consist of oral and written presentations by students, faculty members, and guest lecturers. The emphasis will be on the broad integrative aspects of toxicology with particular reference to the whole organism and higher levels of natural systems; risk assessment and regulatory toxicology.

*Prerequisite(s):* TOX\*2000, TOX\*3300

*Restriction(s):* Registration in B.Sc. Honours Toxicology students in their 7th or 8th semester. Departments of Biomedical Sciences and School of Environmental Sciences.

### **TOX\*4550 Toxicological Risk Characterization W (3-0) [0.50]**

This is a biologically based, advanced course that will give students working knowledge of current processes and techniques for toxicological risk characterization. The course material will cover the topics of problem definition, effect characterization, exposure characterization, risk assessment, and risk management decision making. (Also listed as ENVB\*4550.)

*Prerequisite(s):* TOX\*2000, ENVB\*3030

*Equate(s):* ENVB\*4550

### **TOX\*4590 Biochemical Toxicology F (3-0) [0.50]**

This course will focus on the biotransformation of drugs, carcinogens, and other toxicants, including consideration of human health implications of these metabolic processes. The enzymes catalyzing these reactions will be discussed in detail. Designed for students specializing in Toxicology or Biochemistry. Department of Chemistry.

*Prerequisite(s):* (1 of BIOC\*3570, CHEM\*3430, TOX\*3300), BIOC\*3560, MBG\*2020

### **TOX\*4900 Toxicology Research Project I S,F,W (0-9) [1.00]**

This research project in toxicology is designed to provide senior undergraduate students with an opportunity to conduct research in an area of toxicology. Students should note that most projects are of two semesters' duration, and should plan their studies with the expectation that they will also register in TOX\*4910 in a subsequent semester. Students must make arrangements with both the faculty supervisor and the course coordinator at least one semester in advance. The project supervisor should normally be a faculty member from the Toxicology Program.

*Prerequisite(s):* TOX\*3300

*Restriction(s):* Normally a minimum cumulative average of 70% is required. Instructor consent required.

### **TOX\*4910 Toxicology Research Project II S,F,W (0-9) [1.00]**

This course involves a research project in toxicology. Students must make arrangements with both the faculty supervisor and the course coordinator at least one semester in advance. The project supervisor should normally be a faculty member from the Toxicology Program.

*Prerequisite(s):* TOX\*4900

*Restriction(s):* Normally a minimum cumulative average of 70% is required. Instructor consent required.

## Veterinary Medicine

*Department of Biomedical Sciences*

*Department of Clinical Studies*

*Department of Pathobiology*

*Department of Population Medicine*

*The hours in courses below indicate the approximate equivalent number of semester course hours.*

**These courses will be available only to students registered in the D.V.M. program.**

### **VETM\*3000 Veterinary Biochemistry P1 (2-1) [0.50]**

This course integrates the biochemistry of the healthy animal with a study of some abnormalities in metabolic pathways. The emphasis is on understanding the physiological and biochemical mechanisms and regulatory processes within cells, tissues and organs, as a basis for later courses on diseases. Department of Biomedical Sciences.

*Co-requisite(s):* All Phase 1 courses.

### **VETM\*3070 Veterinary Anatomy P1 (2-6) [2.00]**

An introduction to comparative, topographical anatomy, primarily of 4 domestic mammals: cat, dog, horse and cow. Full dissections of these species are related to the living animal and to imaging, to form the basis for future studies in clinical morphology. Students are first introduced to the major anatomical systems and then to the regions in detail: thorax, abdomen, pelvis and perineum, limbs, and head and neck. Active learning, problem solving, communication skills and the integration of material across concurrent courses are fostered. Department of Biomedical Sciences.

*Co-requisite(s):* All Phase 1 courses.

### **VETM\*3080 Veterinary Physiology P1 (3-3) [1.50]**

The course describes the physiological processes carried out by the major tissues and organ systems, and the regulatory mechanisms that affect tissue and organ function. Topics dealt with in the course include the following: the cellular and chemical constituents of blood, blood coagulation and haemostasis, the function of the immune system, resistance to infectious agents and the principles of immunoprophylaxis, cardiac function, cardiovascular haemodynamics, blood pressure, peripheral and regional circulation of blood, the lymph circulation, the structure and function of the mammalian nervous system and organs associated with special senses, the functions of the digestive tract, lungs and kidney thermoregulation and water, electrolyte and acid-base balance. The homeostatic features and species variation of the tissue organ systems will be emphasized. Departments of Biomedical Sciences and Pathobiology.

*Co-requisite(s):* All Phase 1 courses.

### **VETM\*3120 Veterinary Histology P1 (3-3) [0.75]**

A lecture and laboratory course emphasizing the microscopic organization of the tissues and organs of domestic animals in various physiological states. Correlations between morphology and function of various cells and tissues comprising the organ systems will be discussed. Department of Biomedical Sciences.

*Co-requisite(s):* All Phase 1 courses.

### **VETM\*3210 Art of Veterinary Medicine I P1 (V-V) [0.50]**

In a series of integrated modules, this course will assist students in increasing their self-awareness and comprehension of a range of legal, professional and ethical values and behaviours that are essential and normal components of veterinary medicine. Emphasis will be placed on understanding, evaluating and improving interpersonal relations and oral and written communication skills. The ethical principles that underlie veterinary medicine will be explored in depth. The course will also assist students in understanding their position in the developing history of veterinary medicine and inform them of emerging trends. Issues related to professional development, how other species interact with humans, and the client/patient/veterinarian triad will be introduced. The application of these learned skills in the resolution of problems will be introduced. OVC Dean's Office, Department of Population Medicine and the Veterinary Teaching Hospital.

*Co-requisite(s):* All Phase 1 courses.

### **VETM\*3220 Art of Veterinary Medicine II P2 (2-0) [0.50]**

Using modules, this course will build on, and enhance, the knowledge base and skill set acquired in Phase I in the area of communications, human-animal interactions, professional development, and the client/patient/veterinarian triad. The focus in these areas will now move towards recognising difficulties that may arise and how to differentiate abnormal situations from normal ones. Problem-solving, conflict resolution and stress management through application of innate and acquired knowledge and skills will be developed. In addition, the course will introduce concepts of business and entrepreneurial skills which are required for successful veterinary practice. OVC Dean's Office, Department of Population Medicine and the Veterinary Teaching Hospital.

*Prerequisite(s):* VETM\*3210

*Co-requisite(s):* All Phase 2 courses.

### **VETM\*3390 Veterinary Medical Genetics P1 (1-1) [0.50]**

The course deals with the genetic basis of disease and birth defects in general and the salient features and inheritance patterns of the common birth defects, metabolic errors and reproductive problems in domestic animals. Department of Biomedical Sciences.

*Co-requisite(s):* All Phase 1 courses.

### **VETM\*3400 Health Management I P1 (3-1) [0.75]**

The course is the first of two comprehensive and integrated courses that will span the first two phases of the DVM program. Both courses are intended to establish the foundation for, and contribute to the students' achievement of selected DVM 2000 elements of competency in the context of the principles of health management. The primary emphasis of this component is to establish the historical perspective and basic tools required for health promotion and disease prevention. Department of Population Medicine.

*Co-requisite(s):* All Phase 1 courses.

### **VETM\*3410 Health Management II P2 (3-0) [0.75]**

This course is a continuation of the Phase 1 course Health Management I. Previously presented concepts will be explored in greater depth and complexity. Additional emphasis will be placed on relevant epidemiological tools for monitoring, outbreak investigation, critical appraisal and the applications of principles from the previous course in the series to measure performance, including relevant production genetics, and animal behaviour in a species/industry context. Department of Population Medicine.

*Prerequisite(s):* All Phase 1 courses.

*Co-requisite(s):* All Phase 2 courses.

### **VETM\*3430 Clinical Medicine I P1 (V-V) [0.25]**

The course will contribute to students' achievement of selected DVM 2000 elements of competency in the areas of animal handling and the clinical examination of various species. Students will become familiar with the expected variation in common clinical parameters and how this variation is impacted by aging, changes in health status, and external environmental influences and other sources of stress. Students will be introduced to clinical problem solving using case material from the Veterinary Teaching Hospital. They will develop their verbal and written communication skills through case simulations and analyses. The course will be presented using lectures, laboratory classes and independent study. The graduating competencies can be found on the OVC website (<http://www.ovcnet.uoguelph.ca/homepage/html>). Department of Clinical Studies.

*Co-requisite(s):* All Phase 1 courses.

### **VETM\*3440 Clinical Medicine II P2 (0-2) [0.50]**

The course is a continuation of Clinical Medicine I. It will contribute to students' achievement of selected elements of graduating competency in the areas of clinical examination of specific organ systems of various species. Students will enhance and refine their clinical problem solving skills using case material from the Veterinary Teaching Hospital. They will continue to develop their verbal and written communication skills through case simulations and analyses. The course will be presented using lectures, laboratory classes and independent study. The graduating competencies can be found on the OVC website (<http://www.ovcnet.uoguelph.ca/homepage/html>). Department of Clinical Studies.

*Prerequisite(s):* All Phase 1 courses.

*Co-requisite(s):* All Phase 2 courses.

### **VETM\*3450 Principles of Disease in Veterinary Medicine P2 (V-V) [2.75]**

This course addresses several major topics, including principles of disease induction and transmission, host response to threat and injury, pathogenetic mechanisms of infectious and toxic agents, and manipulation of disturbances in health. The interaction among host, environmental, and etiologic factors in the development of disease will be highlighted. Students will learn to recognize, describe, and evaluate disturbances of health and homeostasis at the level of the population, individual animal, organ system, tissue and cell using a variety of diagnostic modalities. Departments of Biomedical Sciences and Pathobiology.

*Prerequisite(s):* All Phase 1 courses.

*Co-requisite(s):* All Phase 2 courses.

### **VETM\*3460 Theriogenology P2 (V-V) [0.75]**

A lecture and laboratory course covering the normal and abnormal reproductive systems of domestic animals. The course will include mammalian reproductive physiology and histology, diagnosis and treatment of reproductive disorders, including infertility, and management of breeding programs of the common domestic species. An introduction to the new reproductive technologies used in theriogenology will also be provided. Departments of Biomedical Sciences, Pathobiology and Population Medicine.

*Prerequisite(s):* All Phase 1 courses.

*Co-requisite(s):* All Phase 2 courses.

**VETM\*3470 Anaesthesiology and Pharmacology P2 (V-V) [0.75]**

This course provides the general principles, pharmacologic basis, and practical applications of general and local anaesthesia in small and large animals. Other topics covered include fluid and acid-base imbalance and the prevention and treatment of surgical shock. Departments of Biomedical Sciences and Clinical Studies.

*Prerequisite(s):* All Phase 1 courses.

*Co-requisite(s):* All Phase 2 courses.

**VETM\*3510 Principles of Surgery P2 (2-0) [0.25]**

The principles of surgery in various animal species are given. The lecture topics include patient and surgeon preparation, tissue handling instrumentation, suturing and surgical principles and approaches to various organ systems and anatomical regions. Department of Clinical Studies.

*Prerequisite(s):* All Phase 1 courses.

*Co-requisite(s):* All Phase 2 courses.

**VETM\*4220 Art of Veterinary Medicine III P3 (2-0) [0.50]**

This modular course will require students to apply the knowledge and skills acquired in Phases 1 and 2 to problems that incorporate aspects of one or more of the following areas: communications and conflict resolution, ethics, professional behaviour, human-animal interactions, analysis and planning, and business issues. This course will focus on methods to resolve difficulties in the above areas that are interfering with intrapersonal and interpersonal relationships and with how to return abnormal situations to normal ones. Problem-solving, conflict resolution and stress management through application of innate and acquired knowledge and skills will be expected. The course will be taught primarily through case analysis. OVC Dean's Office, Department of Population Medicine, Veterinary Teaching Hospital.

*Prerequisite(s):* All Phase 2 courses.

*Co-requisite(s):* All Phase 3 courses.

**VETM\*4420 Clinical Pharmacology P3 (V-V) [0.25]**

This course stresses rational drug therapy through an understanding of drug factors, host factors and disease factors, with emphasis on clinically relevant properties of selected major drug classes and used for therapy (prevention and treatment) in small animals, food animals, and horses.

*Prerequisite(s):* All Phase 2 courses.

*Co-requisite(s):* All Phase 3 courses.

*Restriction(s):* Registration in the D.V.M. Program

**VETM\*4450 Equine Medicine and Surgery P3 (3-0) [0.50]**

The course will contribute to students' achievement of selected DVM 2000 elements of competency in the context of the horse. The primary emphasis is directed towards developing the skills, knowledge and attitudes that will permit the entry-level veterinarian to develop strategies to deal with common and uncommon diagnoses. Department of Clinical Studies.

*Prerequisite(s):* All Phase 2 courses.

*Co-requisite(s):* All Phase 3 courses.

**VETM\*4460 Food Animal Medicine and Surgery P3 (V-V) [1.00]**

The course will contribute to students' achievement of selected DVM 2000 elements of competency in the context of the common ruminant species and swine. The primary emphasis is directed towards developing the skills, knowledge and attitudes that will permit the entry-level veterinarian to develop strategies to deal with common and uncommon diagnoses. The graduating competencies can be found on the OVC website (<http://www.ovcnet.uoguelph.ca/homepage/html>). Departments of Clinical Studies and Population Medicine.

*Prerequisite(s):* All Phase 2 courses.

*Co-requisite(s):* All Phase 3 courses.

**VETM\*4470 Medicine and Surgery of Dog and Cat P3 (V-V) [1.00]**

The course will contribute to students' achievement of selected DVM 2000 elements of competency in the context of the dog and cat. The primary emphasis is directed towards developing the skills, knowledge and attitudes that will permit the entry-level veterinarian to develop strategies to deal with common and uncommon diagnoses. The graduating competencies can be found on the OVC website (<http://www.ovcnet.uoguelph.ca/homepage/html>). Department of Clinical Studies.

*Prerequisite(s):* All Phase 2 courses.

*Co-requisite(s):* All Phase 3 courses.

**VETM\*4480 Comparative Medicine P3 (V-V) [0.75]**

The course will contribute to students' achievement of selected elements of graduating competency in the context of pet birds, commercial poultry and non-traditional species (fish, amphibians, reptiles, rabbits, rodents, ferrets, non-domestic carnivores and non-domestic ungulates). The primary emphasis is directed towards enhancing the skills, knowledge and attitudes that will permit the entry-level veterinarian to develop strategies to deal with common and uncommon diagnoses. The graduating competencies can be found on the OVC website (<http://www.ovcnet.uoguelph.ca/homepage/html>). Department of Pathobiology.

*Prerequisite(s):* All Phase 2 courses.

*Co-requisite(s):* All Phase 3 courses.

**VETM\*4490 Systems Pathology P3 (V-V) [1.00]**

The course will contribute to students' achievement of selected elements of graduating competency in the context of pathobiology across the range of species. The primary emphasis is directed towards developing the skills, knowledge and attitudes that will permit the entry-level veterinarian to carry out the post-mortem examinations, select and perform relevant ancillary diagnostic tests and procedures, interpret findings, and initiate and interpret results of further investigations. The graduating competencies can be found on the OVC website (<http://www.ovcnet.uoguelph.ca/homepage/html>). Department of Pathobiology.

*Prerequisite(s):* All Phase 2 courses.

*Co-requisite(s):* All Phase 3 courses.

**VETM\*4530 Health Management III P3 (V-V) [0.50]**

The course will contribute to students' achievement of greater depth in selected elements of graduating competency in the context of health management in species of their choice. The primary emphasis is directed towards developing species-specific skills, knowledge and attitudes that will permit the entry-level veterinarian to assess and advise on animal production and performance and evaluate the necessity for, and implementation of, health management programs. The course is constructed of a series of species-based modules. Students will be required to take two of the modules. The graduating competencies can be found on the OVC website (<http://www.ovcnet.uoguelph.ca/homepage/html>). Department of Population Medicine.

*Prerequisite(s):* All Phase 2 courses.

*Co-requisite(s):* All Phase 3 courses.

**VETM\*4540 Surgical Exercises P3 (V-V) [1.75]**

Veterinary students receive training in preoperative planning, anaesthesia and surgical techniques, operative room decision making and post-operative care in this laboratory course. Students begin by practicing technical skills on inanimate models. They progress to performing a series of supervised operations designed to parallel the most commonly performed surgeries in private practice. A once weekly rounds period allows discussion of issues arising from the previous anaesthesia and surgery, and planning for the upcoming laboratory. Though some didactic material is presented, the course is mainly experiential. The evaluation outcome of the course is outstanding, pass or fail. Department of Clinical Studies

*Prerequisite(s):* All Phase 2 courses.

*Co-requisite(s):* All Phase 3 courses.

*Restriction(s):* Registration in the D.V.M. Program

**VETM\*4610 Small Animal Clinics - Small Animal Stream P4 (V-V) [3.25]**

This course is for students who have selected the Small Animal Stream in Phase 4 or DVM Program. The goal of the small animal clinics course is to assist in the role transformation from veterinary student to veterinary practitioner. The course is largely experiential in structure and process. Small groups of students will rotate through various service areas, and actively participate in the diagnosis and treatment of client-owned animals in the teaching hospital. Regularly scheduled small group discussions allow the exploration of issues during diagnosis and management of the individual cases.

*Prerequisite(s):* All Phase 3 courses.

*Co-requisite(s):* VETM\*4620, VETM\*4880, VETM\*4900

*Restriction(s):* Registration in the DVM program.

**VETM\*4620 Health Management - Small Animal Stream P4 (V-V) [1.00]**

This course is for students who have selected the Small Animal Stream in Phase 4 or DVM Program. The goal of the health management course is to assist in the role transformation from veterinary student to veterinary practitioner. The course is largely experiential in structure and process. Small groups of students will participate in a series of rotations that emphasize the implementation of veterinary directed management programs, which affect the health of animals and ultimately humans.

*Prerequisite(s):* All Phase 3 courses.

*Co-requisite(s):* VETM\*4610, VETM\*4880, VETM\*4900

*Restriction(s):* Registration in the DVM program.



**VETM\*4660 Small Animal Clinics - Mixed Stream P4 (V-V) [2.00]**

This course is for students who have selected the Mixed Stream in Phase 4 or DVM Program. The goal of the small animal clinics course is to assist in the role transformation from veterinary student to veterinary practitioner. The course is largely experiential in structure and process. Small groups of students will rotate through various service areas, and actively participate in the diagnosis and treatment of client-owned animals in the teaching hospital. Regularly scheduled small group discussions allow the exploration of issues during diagnosis and management of the individual cases.

*Prerequisite(s):* All Phase 3 courses.

*Co-requisite(s):* VETM\*4670, VETM\*4680, VETM\*4890, VETM\*4900

*Restriction(s):* Registration in the DVM program.

**VETM\*4670 Large Animal Clinics - Mixed Stream P4 (V-V) [1.50]**

This course is for students who have selected the Mixed Stream in Phase 4 or DVM Program. The goal of the large animal clinics course is to assist in the role transformation from veterinary student to veterinary practitioner. The course is largely experiential in structure and process. Small groups of students will rotate through various service areas, and actively participate in the diagnosis and treatment of client-owned animals in the teaching hospital. Regularly scheduled small group discussions allow the exploration of issues during diagnosis and management of the individual cases.

*Prerequisite(s):* All Phase 3 courses.

*Co-requisite(s):* VETM\*4660, VETM\*4680, VETM\*4890, VETM\*4900

*Restriction(s):* Registration in the DVM program.

**VETM\*4680 Health Management - Mixed Stream P4 (V-V) [2.00]**

This course is for students who have selected the Mixed Stream in Phase 4 of the DVM Program. The goal of the health management course is to assist in the role transformation from veterinary student to veterinary practitioner. The course is largely experiential in structure and process. Small groups of students will participate in a series of rotations that emphasize the implementation of veterinary directed management programs, which affect the health of animals and ultimately humans.

*Prerequisite(s):* All Phase 3 courses.

*Co-requisite(s):* VETM\*4660, VETM\*4670, VETM\*4890, VETM\*4900

*Restriction(s):* Registration in the DVM program.

**VETM\*4710 Large Animal Clinics - Food Animal Stream P4 (V-V) [1.00]**

This course is for students who have selected the Food Animal Stream in Phase 4 or DVM Program. The goal of the large animal clinics course is to assist in the role transformation from veterinary student to veterinary practitioner. The course is largely experiential in structure and process. Small groups of students will rotate through various service areas, and actively participate in the diagnosis and treatment of client-owned animals in the teaching hospital. Regularly scheduled small group discussions allow the exploration of issues during diagnosis and management of the individual cases.

*Prerequisite(s):* All Phase 3 courses.

*Co-requisite(s):* VETM\*4720, VETM\*4880, VETM\*4900

*Restriction(s):* Registration in the DVM program.

**VETM\*4720 Health Management - Food Animal Stream P4 (V-V) [3.25]**

This course is for students who have selected the Food Animal Stream in Phase 4 of the DVM Program. The goal of the health management course is to assist in the role transformation from veterinary student to veterinary practitioner. The course is largely experiential in structure and process. Small groups of students will participate in a series of rotations that emphasize the implementation of veterinary directed management programs, which affect the health of animals and ultimately humans.

*Prerequisite(s):* All Phase 3 courses.

*Co-requisite(s):* VETM\*4710, VETM\*4880, VETM\*4900

*Restriction(s):* Registration in the DVM program.

**VETM\*4870 Clinical Medicine III P3 (0-2) [0.25]**

This course will contribute to students' achievement of selected DVM 2000 elements of competency in the context of the hospital environment. This is an integrated course in which students will enhance a variety of clinical skills, including physical examination, history taking, problem solving, and ancillary diagnostic tests and procedures. This course is primarily carried out in the Veterinary Teaching Hospital where students will be exposed to case material from the Large and Small Animal Clinics. The emphasis is directed towards enhancing the skills, knowledge and attitudes that will permit the student to maximize the benefit to be derived from senior year courses. Department of Clinical Studies.

*Prerequisite(s):* All Phase 2 courses.

*Co-requisite(s):* All Phase 3 courses.

**VETM\*4880 Electives in Veterinary Medicine I P4 (V-V) [3.25]**

This course is for students who have selected the Small Animal or Food Animal Stream in Phase 4 of the DVM Program. The goal of this course is to provide students the opportunity to pursue greater breadth and depth in their program according to their interests. The course is largely experiential in structure and process. Students will select a series of approved internal and external rotations that will allow them to pursue areas of interest in veterinary medicine.

*Prerequisite(s):* All Phase 3 courses.

*Co-requisite(s):* (VETM\*4610 or VETM\*4710), (VETM\*4620 or VETM\*4720), VETM\*4900

*Restriction(s):* Registration in the DVM program.

**VETM\*4890 Electives in Veterinary Medicine II P4 (V-V) [2.00]**

This course is for students who have selected the Mixed or Equine Stream in Phase 4 of the DVM Program. The goal of this course is to provide students the opportunity to pursue greater breadth and depth in their program according to their interests. The course is largely experiential in structure and process. Students will select a series of approved internal and external rotations that will allow them to pursue areas of interest in veterinary medicine.

*Prerequisite(s):* All Phase 3 courses.

*Co-requisite(s):* (VETM\*4660 or VETM\*4920), (VETM\*4670 or VETM\*4930), (VETM\*4680 or VETM\*4940) VETM\*4900

*Restriction(s):* Registration in the DVM program.

**VETM\*4900 Veterinary Externship P4 (0-0) [2.50]**

This is an eight-week experiential learning opportunity that junior students in the DVM Program must organize by the mid-way through Phase 3. The externship must be in approved private, primary care, veterinary practice. Senior students in the DVM Program, under the supervision of a designated host veterinarian, will experience being part of a team providing health care services to the public. This course will provide students with the opportunity to integrate and apply their knowledge and experience from previous courses, and further refine their problem-solving and communication skills, and enhance their ability to work as part of a team. The evaluation outcome of this course is outstanding, pass or fail. Coordinated by the Department of Clinical Studies.

*Prerequisite(s):* All Phase 1, Phase 2 and Phase 3 courses.

**VETM\*4920 Small Animal Clinics - Equine Stream P4 (V-V) [1.50]**

This course is for students who have selected the Equine Stream in Phase 4 or DVM Program. The goal of the small animal clinics course is to assist in the role transformation from veterinary student to veterinary practitioner. The course is largely experiential in structure and process. Small groups of students will rotate through various service areas, and actively participate in the diagnosis and treatment of client-owned animals in the teaching hospital. Regularly scheduled small group discussions allow the exploration of issues during diagnosis and management of the individual cases.

*Prerequisite(s):* All Phase 3 courses.

*Co-requisite(s):* VETM\*4890, VETM\*4900, VETM\*4930, VETM\*4940

*Restriction(s):* Registration in the DVM program.

**VETM\*4930 Large Animal Clinics - Equine Stream P4 (V-V) [2.50]**

This course is for students who have selected the Equine Stream in Phase 4 or DVM Program. The goal of the large animal clinics course is to assist in the role transformation from veterinary student to veterinary practitioner. The course is largely experiential in structure and process. Small groups of students will rotate through various service areas, and actively participate in the diagnosis and treatment of client-owned animals in the teaching hospital. Regularly scheduled small group discussions allow the exploration of issues during diagnosis and management of the individual cases.

*Prerequisite(s):* All Phase 3 courses.

*Co-requisite(s):* VETM\*4890, VETM\*4900, VETM\*4920, VETM\*4940

*Restriction(s):* Registration in the DVM program.

**VETM\*4940 Health Management - Equine Stream P4 (V-V) [1.50]**

This course is for students who have selected the Equine Stream in Phase 4 of the DVM Program. The goal of the health management course is to assist in the role transformation from veterinary student to veterinary practitioner. The course is largely experiential in structure and process. Small groups of students will participate in a series of rotations that emphasize the implementation of veterinary directed management programs, which affect the health of animals and ultimately humans.

*Prerequisite(s):* All Phase 3 courses.

*Co-requisite(s):* VETM\*4670, VETM\*4890, VETM\*4900, VETM\*4920

*Restriction(s):* Registration in the DVM program.

## Women's Studies

### College of Arts

#### **WMST\*1000 Introduction to Women's Studies F (3-0) [0.50]**

An introduction to the methods and analyses of Women's Studies. An interdisciplinary feminist and multicultural examination of research about women and the gendered nature of societies and cultures. Areas of inquiry may include psychology, law, science, culture, work, family, violence, health, and sexuality.

*Equate(s):* ISS\*2200 , WMST\*2200

#### **WMST\*2000 Women and Representation W (3-0) [0.50]**

An interdisciplinary analysis of the role gender plays in representation, drawing on areas such as television, film, music, literature, visual arts, ethnography, medicine and law. International and cross-cultural perspectives included.

#### **WMST\*3000 Feminist Theory and Methods F (3-0) [0.50]**

A comparative and critical examination of feminist theories and their methodological implications, including contributions of and tensions between various feminisms. Special attention to contemporary developments in the field.

*Prerequisite(s):* 10.00 credits including (1 of ISS\*2200 , WMST\*1000, WMST\*2200 ), (0.50 additional credits from Women's Studies List A), (1 of ARTH\*2480, DRMA\*2300 , ENGL\*2120, PHIL\*2060, POLS\*2000, SOAN\*2400)

#### **WMST\*3010 Gender and Diversity W (3-0) [0.50]**

An examination of studies of the interaction of gender with race, class, ethnicity, sexual orientation, ability/disability, and other axes of difference as they position women within systems of power. Students will compare and assess contemporary theories, approaches, and research that address together gender and diversity issues and problems.

*Prerequisite(s):* 10.00 credits including WMST\*1000, WMST\*2000, 0.50 additional credits from Women's Studies List A

#### **WMST\*4010 Seminar in Women's Studies W (3-0) [0.50]**

The framework of the course will be provided by a series of unresolved issues or challenging questions regarding women which will call upon the students' critical, evaluative, and integrative abilities. The content will largely depend upon the students' backgrounds within the program and their other major areas of study.

*Prerequisite(s):* 15.00 credits including WMST\*1000, WMST\*2000 and 1.00 additional credits from Women's Studies List A at the 3000 level or above.

## Zoology

### Department of Integrative Biology

#### ZOO\*2090 Vertebrate Structure and Function F (2-3) [0.50]

This course offers a comparative survey of the structure and functioning of the chordates with emphasis on the vertebrates and includes a laboratory study of the anatomy of selected vertebrates.

*Prerequisite(s):* 4.00 credits including (BIOL\*1040 or BIOL\*1070)

#### ZOO\*2100 Developmental Biology F,W (3-3) [0.50]

This course provides an introduction to animal development through the study of reproduction, early embryology, histogenesis, organogenesis, and morphogenesis. The roles of determination, differentiation, growth, morphogenesis, and pattern formation will be emphasized.

*Prerequisite(s):* 4.00 credits including [BIOL\*1040 or (BIOL\*1070, BIOL\*1090)]

#### ZOO\*2700 Invertebrate Morphology & Evolution W (3-3) [0.50]

This course examines the vast diversity of invertebrate taxa and the tools and concepts used to classify them and understand their origins. Principles of zoogeography, phylogeny, natural selection and comparative analyses will form the conceptual backbone of the course. In lectures and labs, students will 'climb' the tree of life, from the most ancient pre-invertebrates to more derived forms, and explore their anatomical and morphological diversity.

*Prerequisite(s):* 4.00 credits including (BIOL\*1040 or BIOL\*1070)

*Equate(s):* IBIO\*2300

*Restriction(s):* ZOO\*2070 , ZOO\*2080

#### ZOO\*3000 Comparative Histology W (3-3) [0.50]

This course provides an introduction to the microscopic structure of the major organ systems of the vertebrate body. Beginning with an examination of epithelial, connective, muscular, and nervous tissues, the course then examines the comparative histology of the circulatory, nervous, digestive, integumentary, respiratory, excretory, reproductive, endocrine, and sensory systems of vertebrates.

*Prerequisite(s):* 1 of BIOM\*3010, BIOM\*3100 , BIOM\*3200, HK\*3940, HK\*3401/2, ZOO\*2090, ZOO\*3200, ZOO\*3210

#### ZOO\*3200 Comparative Animal Physiology I F (3-3) [0.50]

The course will examine the underlying molecular and cellular events which mediate physiological processes and contribute to whole animal homeostasis. Particular emphasis will be placed on comparing the strategies and adaptations used by different animals and the influence of varying environmental conditions. The course discusses cellular physiology, neuromuscular physiology and endocrinology. This course involves exercises that use animals. BIOM\*3100 , BIOM\*3110 and HK\*3940 are available to cover similar material without labs.

*Prerequisite(s):* BIOC\*2580

#### ZOO\*3210 Comparative Animal Physiology II W (3-3) [0.50]

This is the second course that provides an introduction to the physiological mechanisms used by vertebrates and invertebrates. The course will examine the underlying molecular and cellular events which mediate physiological processes and contribute to whole animal homeostasis. Particular emphasis will be placed on comparing the strategies and adaptations used by different animals and the influence of varying environmental conditions. The course discusses respiratory, cardiovascular, osmoregulatory and digestive physiology. This course involves exercises that use animals. BIOM\*3100 , BIOM\*3110 and HK\*3940 are available to cover similar material without labs.

*Prerequisite(s):* BIOC\*2580

#### ZOO\*3700 Integrative Biology of Invertebrates F (3-3) [0.50]

This course explores variation in physiology, reproduction and life history among invertebrates, and the role of invertebrates in marine, freshwater and terrestrial ecosystems. Through field experiences, lab study and a class experiment, we will examine the diverse solutions that invertebrates have evolved to live in very different environments, including: circulation and gas exchange; feeding and digestion; osmoregulation and excretion, nervous system and sensory structures; locomotion and biomechanics, and invertebrate communities.

*Prerequisite(s):* IBIO\*2300 , ZOO\*2700

*Equate(s):* IBIO\*3300

*Restriction(s):* ZOO\*2080

#### ZOO\*4070 Animal Behaviour F (3-0) [0.50]

This course provides an introduction to the theories and principles of the behaviour of animals. It includes comparative studies of learning, socialization, social interaction, and other components of animal behaviour.

*Prerequisite(s):* STAT\*2040, (BIOL\*3400, ZOO\*3300 )

#### ZOO\*4170 Experimental Comparative Animal Physiology W (3-3) [0.50]

In this course an experimental approach to the study of physiological mechanisms and adaptive responses to changes in the environment will be stressed. The focus of the course will be on laboratory exercises.

*Prerequisite(s):* 1 of BIOM\*3110 , BIOM\*3200, HK\*3940, ZOO\*3200, ZOO\*3210

#### ZOO\*4300 Marine Biology and Oceanography F (3-3) [0.75]

This intensive two-week course is held in late August or early September before classes commence for the Fall semester. The course is held at the Huntsman Marine Science Centre, St. Andrews, New Brunswick. The ecology, behaviour, physiology, biochemistry, biomechanics of marine plants and animals will be studied as well as basic oceanographic techniques. Students will be able to familiarize themselves with the techniques and equipment involved in various branches of marine biology and oceanography. In addition to regular tuition fees, students are responsible for the cost of transportation to St. Andrews, and for charges levied by the Huntsman Marine Science Centre for room and board. These fees are paid to Student Finance and Awards of the University of Guelph. A department application form must be submitted for approval before course selection. The signature of the course coordinator is required to select the course. This course must be recorded as part of your Fall course selection and tuition and compulsory fees will be calculated accordingly. Students taking this course DO NOT use course numbers reserved for Ontario Universities Program in Field Biology.

*Prerequisite(s):* BIOL\*3450, ( IBIO\*2300 or ZOO\*2700)

#### ZOO\*4330 Biology of Fishes W (2-3) [0.50]

This course provides a comparative examination of selected freshwater and marine fishes to illustrate the significance of environmental influences on life styles, behavioral patterns, physiological responses, population biology and community structure. The use of niche, habitat and ecotop concepts in defining the role of fishes in representative types of aquatic ecosystems will be examined.

*Prerequisite(s):* ( IBIO\*4220 or ZOO\*4930), STAT\*2040

#### ZOO\*4540 Marine and Freshwater Research F,W (0-6) [0.50]

In this course, students will design, execute and communicate the results of a research project involving aquatic organisms. This will involve an examination of the primary scientific literature, the formulation of hypotheses, the design of experiments, the development of analytical skills and familiarity with the operation of analytical equipment and data analysis. Faculty guidance will be provided.

*Prerequisite(s):* BIOL\*3450, BIOC\*2580, PHYS\*1080, STAT\*2040

*Restriction(s):* Registration in semester 7 or 8 of the Marine and Freshwater Biology Major of the B.Sc. Program.

#### ZOO\*4570 Marine Ecological Processes F (3-1) [0.50]

Advanced consideration of physical and biogeochemical processes in the world's oceans. Examination of the critical dependence of biological processes on physical and chemical processes from micro- to macro-scales. The processes involved in: production and energy transfer within pelagic food webs; export of energy to the benthos; the structure and dynamics of marine communities.

*Prerequisite(s):* BIOL\*3450, PHYS\*1080

#### ZOO\*4910 Integrative Vertebrate Biology F (3-0) [0.50]

This course examines the proximate and historical causes of diversity in morphology, physiology and behaviour among major groups of vertebrates (fishes, amphibians, reptiles, birds, mammals). First, topics such as vertebrate origins, zoogeography, taxonomy and comparative methods will be developed as a foundation for inquiry. The remainder of the course will be organized around specific contemporary problems in vertebrate biology such as the evolution of endothermy; feeding strategies and metabolism; locomotion and migration; trends in vertebrate reproduction; evolution of brain size and complexity in relation to cognition and communication. Each problem will be explored through analyses of taxonomic diversity, historical and phylogenetic constraints, physiological and developmental causes, and functional effects.

*Prerequisite(s):* ZOO\*2090, ZOO\*2100

*Co-requisite(s):* (ZOO\*3200 or ZOO\*3210), (BIOL\*3400 or ZOO\*3300 )

*Equate(s):* IBIO\*4200

#### ZOO\*4920 Lab Studies in Ornithology F (0-3) [0.25]

This course provides a practical experience in the study of Ornithology. Using University collections of prepared and preserved specimens and field observations where possible, students will develop and apply skills in identification and sampling, explore relations between species diversity and habitat, and investigate, through guided study, the extent of anatomical, skeletal, reproductive and morphological variation and its functional and evolutionary causes.

*Prerequisite(s):* ZOO\*2090, ZOO\*2100

*Co-requisite(s):* (ZOO\*3200 or ZOO\*3210), ( IBIO\*4200 or ZOO\*4910), (BIOL\*3400 or ZOO\*3300 )

*Equate(s):* IBIO\*4210

*Restriction(s):* ZOO\*4090

**ZOO\*4930 Lab Studies in Ichthyology F (0-3) [0.25]**

This course provides a practical experience in the study of fishes. Using University collections of prepared and preserved specimens and field observations where possible, students will develop and apply skills in identification and sampling, explore relations between species diversity and habitat, and investigate through guided study, the extent of anatomical, skeletal, reproductive and morphological variation and its functional and evolutionary causes.

*Prerequisite(s):* ZOO\*2090, ZOO\*2100

*Co-requisite(s):* (ZOO\*3200 or ZOO\*3210), ( IBIO\*4200 or ZOO\*4910), (BIOL\*3400 or ZOO\*3300 )

*Equate(s):* IBIO\*4220

*Restriction(s):* ZOO\*4020

**ZOO\*4940 Lab Studies in Herpetology W (0-3) [0.25]**

This course provides a practical experience in the study of Herpetology. Using University collections of prepared and preserved specimens and field observations where possible, students will develop and apply skills in identification and sampling, explore relations between species diversity and habitat, and investigate through guided study, the extent of anatomical, skeletal, reproductive and morphological variation and its functional and evolutionary causes.

*Prerequisite(s):* ZOO\*2090, ZOO\*2100

*Co-requisite(s):* (ZOO\*3200 or ZOO\*3210), ( IBIO\*4200 or ZOO\*4910), (BIOL\*3400 or ZOO\*3300 )

*Equate(s):* IBIO\*4230

*Restriction(s):* ZOO\*4430

**ZOO\*4950 Lab Studies in Mammalogy W (0-3) [0.25]**

This course provides a practical experience in the study of Mammalogy. Using University collections of prepared and preserved specimens and field observations where possible, students will develop and apply skills in identification and sampling, explore relations between species diversity and habitat, and investigate through guided study, the extent of anatomical, skeletal, reproductive and morphological variation and its functional and evolutionary causes.

*Prerequisite(s):* ZOO\*2090, ZOO\*2100

*Co-requisite(s):* (ZOO\*3200 or ZOO\*3210), ( IBIO\*4200 or ZOO\*4910), (BIOL\*3400 or ZOO\*3300 )

*Equate(s):* IBIO\*4240

*Restriction(s):* ZOO\*4280