

# **2018-2019 Undergraduate Calendar**

The information published in this Undergraduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2018-2019 academic year, including the Summer Semester 2018, the Fall Semester 2018 and the Winter Semester 2019.

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:

- Universities Canada

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## **Disclaimer**

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### **University of Guelph 2018**

The information published in this Undergraduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2018-2019 academic year, including the Summer Semester 2018, the Fall Semester 2018 and the Winter Semester 2019.

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: Enrolment Services

# **Introduction**

## **Collection, Use and Disclosure of Personal Information**

Personal information is collected under the authority of the University of Guelph Act (1964), and in accordance with Ontario's Freedom of Information and Protection of Privacy Act (FIPPA) <http://www.e-laws.gov.on.ca/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 Advanced Education and Skills Development, 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>.

## **Disclosure of Personal Information to the Ontario Ministry of Advanced Education and Skills Development**

The University of Guelph is required to disclose personal information such as characteristics and educational outcomes to the Minister of Advanced Education and Skills Development under s. 15 of the Ministry of Advanced Education and Skills Development Act, R.S.O. 1990, Chapter M.19, as amended. The Ministry collects this data for purposes including but not limited to planning, allocating and administering public funding to colleges, universities and other post-secondary educational and training institutions.

Amendments made to the Ministry of Advanced Education and Skills Development Act, authorizing the collection and use of personal information from colleges and universities by the Minister of Advanced Education and Skills Development, which were set out in Schedule 5 of the Childcare Modernization Act, 2014, came into force on March 31, 2015.

The amendments strengthen the ability of the Minister to directly or indirectly collect and use personal information about students as required to conduct research and analysis, including longitudinal studies, and statistical activities conducted by or on behalf of the Ministry for purposes that relate to post-secondary education and training, including,

- i. understanding the transition of students from secondary school to post-secondary education and training,
- ii. understanding student participation and progress, mobility and learning and employment outcomes,
- iii. understanding linkages among universities, colleges, secondary schools and other educational and training institutions prescribed by regulation,
- iv. understanding trends in post-secondary education or training program choices made by students,
- v. understanding sources and patterns of student financial resources, including financial assistance and supports provided by government and post-secondary educational and training institutions,
- vi. planning to enhance the affordability and accessibility of post-secondary education and training and the quality and effectiveness of the post-secondary sector,
- vii. identifying conditions or barriers that inhibit student participation, progress, completion and transition to employment or future post-secondary educational or training opportunities, and
- viii. developing key performance indicators.

Information that the University is required to provide includes but is not limited to: first, middle and last name, Ontario Educational Number, citizenship, date of birth, gender, first three digits of a student's postal code, mother tongue, degree program and major(s) in which the student is enrolled, year of study and whether the student has transferred from another institution.

Further information on the collection and use of student-level enrolment-related data can be obtained from the Ministry of Advanced Education and Skills Development website: <https://www.ontario.ca/page/ministry-advanced-education-and-skills-development> (English) or <https://www.ontario.ca/fr/page/ministere-de-lenseignement-superieur-et-de-la-formation-professionnelle> (French) or by writing to the Director, Postsecondary Finance and Information Management Branch, Postsecondary Education Division, 7th Floor, Mowat Block, 900 Bay Street, Toronto, ON M7A 1L2.

An update on Institutional and Ministry of Advanced Education and Skills Development Act Notice of Disclosure Activities is posted at <https://www.ontario.ca/page/ministry-advanced-education-and-skills-development>

Frequently Asked Questions related to the Ministry's enrolment and OEN data activities are also posted at: <http://www.tcu.gov.on.ca/pepg/publications/NoticeOfCollection.pdf>

### **Authority to Disclose Personal Information to Statistics Canada**

The Ministry of Advanced Education and Skills Development discloses student-level enrolment-related data it collects from the colleges and universities as required by Statistics Canada in accordance with Section 13 of the Federal Statistics Act. This gives Ministry of Advanced Education and Skills Development Act authority to disclose personal information in accordance with s. 42(1) (e) of FIPPA

## **Notification of Disclosure of Personal Information to Statistics Canada**

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

### **Address for University Communication**

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

#### **Email Address**

The University issued email address is considered an official means of communication with the student and will be used for correspondence from the University. Students are responsible for monitoring their University-issued email account regularly. See Section I--Statement of Students' Academic Responsibilities for more information.

#### **Home Address**

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

#### **Name Changes**

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

## **Student Confidentiality and Release of Student Information Policy Excerpt**

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

Complete policy at <https://uoguelph.civicweb.net/document/68892/ORSInfoReleasePolicy060610.pdf?handle=FF982F8A9AEA4076BE4F3D88147172B8>.

# Learning Outcomes

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On December 5, 2012, the University of Guelph Senate approved five University-wide Learning Outcomes as the basis from which to guide the development of undergraduate degree programs, specializations and courses:

1. Critical and Creative Thinking
2. Literacy
3. Global Understanding
4. Communicating
5. Professional and Ethical Behaviour

These learning outcomes are also intended to serve as a framework through which our educational expectations are clear to students and the broader public; and to inform the process of outcomes assessment through the quality assurance process (regular reviews) of programs and departments.

An on-line guide to the learning outcomes, links to the associated skills, and detailed rubrics designed to support the development and assessment of additional program and discipline-specific outcomes, are available for reference on the [Learning Outcomes website](#).

## 1. Critical and Creative Thinking

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Critical and creative thinking is a concept in which one applies logical principles, after much inquiry and analysis, to solve problems with a high degree of innovation, divergent thinking and risk taking. Those mastering this outcome show evidence of integrating knowledge and applying this knowledge across disciplinary boundaries. Depth and breadth of understanding of disciplines is essential to this outcome.

In addition, **Critical and Creative Thinking** includes, but is not limited to, the following outcomes: **Inquiry and Analysis; Problem Solving; Creativity; and Depth and Breadth of Understanding**.

## 2. Literacy

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Literacy is the ability to extract information from a variety of resources, assess the quality and validity of the material, and use it to discover new knowledge. The comfort in using quantitative literacy also exists in this definition, as does using technology effectively and developing visual literacy.

In addition, **Literacy** includes, but is not limited to, the following outcomes: **Information Literacy, Quantitative Literacy, Technological Literacy, and Visual Literacy**.

## 3. Global Understanding:

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Global understanding encompasses the knowledge of cultural similarities and differences, the context (historical, geographical, political and environmental) from which these arise, and how they are manifest in modern society. Global understanding is exercised as civic engagement, intercultural competence and the ability to understand an academic discipline outside of the domestic context.

In addition, **Global Understanding** includes, but is not limited to, the following outcomes: **Global Understanding, Sense of Historical Development, Civic Knowledge and Engagement, and Intercultural Competence**.

## 4. Communicating

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Communicating is the ability to interact effectively with a variety of individuals and groups, and convey information successfully in a variety of formats including oral and written communication. Communicating also comprises attentiveness and listening, as well as reading comprehension. It includes the ability to communicate and synthesize information, arguments, and analyses accurately and reliably.

In addition, **Communicating** includes, but is not limited to, the following outcomes: **Oral Communication, Written Communication, Reading Comprehension, and Integrative Communication**.

## 5. Professional and Ethical Behaviour

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Professional and ethical behaviour requires the ability to accomplish the tasks at hand with proficient skills in teamwork and leadership, while remembering ethical reasoning behind all decisions. The ability for organizational and time management skills is essential in bringing together all aspects of managing self and others. Academic integrity is central to mastery in this outcome.

In addition, **Professional and Ethical Behaviour** includes, but is not limited to, the following outcomes: **Teamwork, Ethical Reasoning, Leadership, and Personal Organization and Time Management**

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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 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 Management*

### ACCT\*1220 Introductory Financial Accounting F,W (3-0) [0.50]

This introductory course is designed to develop a foundational understanding of current accounting principles and their implication for published financial reports of business enterprises. It builds the base of knowledge and understanding required to succeed in more advanced study of accounting. The course approaches the subject from the point of view of the user of accounting information rather than that of a person who supplies the information.

*Offering(s):* Also offered through Distance Education format.

*Restriction(s):* ACCT\*2220 , This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations. See department for more information.

*Department(s):* Department of Management

### ACCT\*1240 Applied Financial Accounting W (3-0) [0.50]

This course requires students 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. Students will also develop the skills necessary for assessing an organization's system of internal controls and financial conditions.

*Prerequisite(s):* ACCT\*1220 or ACCT\*2220

*Restriction(s):* ACCT\*2240 , This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations. See department for more information.

*Department(s):* Department of Management

### 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):* ACCT\*1220 or ACCT\*2220

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

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

*Department(s):* Department of Management

### ACCT\*3230 Intermediate Management Accounting S,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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* ACCT\*2230

*Equate(s):* BUS\*3230

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

*Department(s):* Department of Management

### ACCT\*3280 Auditing I S,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

*Department(s):* Department of Management

### ACCT\*3330 Intermediate Financial Accounting I F,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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* ACCT\*1220 or ACCT\*2220

*Equate(s):* BUS\*3330

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

*Department(s):* Department of Management

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

This course focuses 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

*Department(s):* Department of Management

### ACCT\*3350 Taxation S,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):* ACCT\*3330

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

*Department(s):* Department of Management

### 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.

*Department(s):* Department of Management

### 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.

*Department(s):* Department of Management

### 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 - ACCT\*3280 as well as the depth and breadth of knowledge gained in ACCT\*3330 and ACCT\*3340.

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

*Equate(s):* BUS\*4270

*Department(s):* Department of Management

### ACCT\*4290 IT Auditing and Data Analytics W (3-0) [0.50]

This course introduces the student to the field of auditing within a computer based environment. Students will develop an enhanced understanding of information systems, information system risks, management controls, control evaluation, audit strategies, and computer assisted audit techniques. The course will also introduce data analytic techniques used to analyze structured and unstructured data.

*Prerequisite(s):* ACCT\*3280 or BUS\*4280

*Equate(s):* BUS\*4290

*Department(s):* Department of Management

### ACCT\*4340 Accounting Theory W (3-0) [0.50]

This course will draw on accounting research, primarily empirical research. Rather than covering specific GAAP rules, the course will focus on how investors react to GAAP rules, why financial information is important, and how its use/misuse affects investor decision making and management behaviour. The course is thus about accounting, instead of about how to apply accounting standards.

*Prerequisite(s):* ACCT\*4220

*Restriction(s):* ACCT\*4240 .

*Department(s):* Department of Management

**ACCT\*4350 Income Taxation II F (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.

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

*Equate(s):* BUS\*4350

*Department(s):* Department of Management

**ACCT\*4440 Integrated Cases in Accounting W (3-0) [0.50]**

This course will help students develop an analytical approach to analyzing accounting problems and improve professional judgement. Students will apply previously-gained technical knowledge of accounting, tax, assurance, finance, and corporate governance to various financial reporting and advisory problems and scenarios. They will develop an enhanced understanding of the impact of user and preparer objectives on the selection of accounting policies, and accounting estimates in an environment of some uncertainty.

*Prerequisite(s):* ACCT\*4220

*Restriction(s):* ACCT\*4240 .

*Department(s):* Department of Management

## Agriculture

*Ontario Agricultural College, Dean's Office*

### AGR\*1110 Introduction to the Agri-Food Systems F (6-0) [1.00]

This introductory course provides an overview of Canadian and global agri-food systems. Students will be introduced to many different facets of agriculture, including primary production (conventional and organic) of commodity, mid-value and high-value crops, and livestock. Students will explore the agri-food system by tracing consumer end-products back to primary production. Modern, industrial agri-food systems as well as subsistence farming will be discussed. The course incorporates an experiential learning component in which students will explore a new agri-food opportunity for Ontario by designing and assessing the value chain.

*Prerequisite(s): AGR\*1100 . AGR\*1250 . Restricted to students in BAH.FARE, BSC(AGR), Minor in Agriculture*

*Department(s): Department of Plant Agriculture, Department of Animal Biosciences*

*Location(s): Guelph*

### AGR\*2050 Agroecology W (3-0) [0.50]

This course considers the interactions of all important biophysical, technical and socioeconomic components of farming systems and examines these systems as the fundamental units of study. Mineral cycles, energy transformations, biological processes and socioeconomic relationships are analyzed as a whole in an interdisciplinary fashion.

*Prerequisite(s): (AGR\*1110 or AGR\*2150), (BIOL\*1050 or BIOL\*1070)*

*Restriction(s): CROP\*2110*

*Department(s): Department of Plant Agriculture, Department of Animal Biosciences*

### 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.

*Prerequisite(s): 4.00 credits*

*Restriction(s): AGR\*2470*

*Department(s): Department of Plant Agriculture*

### AGR\*2320 Soils in Agroecosystems F (3-2) [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): 2.50 credits*

*Restriction(s): ENVS\*2060 or SOIL\*2010*

*Department(s): School of Environmental Sciences*

### 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, nationally and internationally. 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. The course includes laboratories and animal production unit tours.

*Prerequisite(s): BIOL\*1030 or (2 of BIOL\*1050, BIOL\*1070, BIOL\*1080, BIOL\*1090)*

*Department(s): Department of Animal Biosciences*

### 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\*1050 or BIOL\*1070*

*Restriction(s): AGR\*2150*

*Department(s): Department of Plant Agriculture*

### 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 financial support for travel may be available.

*Prerequisite(s): (AGR\*1110 or AGR\*1250 ) or registration in International Development*

*Restriction(s): Registration in BSC(AGR) or BA.ID or Minor in Agriculture Instructor consent required.*

*Department(s): Dean's Office, Ontario Agricultural College*

### 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 a 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.*

*Department(s): Department of Plant Agriculture*

### AGR\*3450 Research Methods in Agricultural Science F (3-2) [0.50]

This course provides students with an opportunity to enhance their understanding of the principles and processes of agricultural research. The course will provide students with a foundation in critical thinking, experimental design and data analysis that will be applicable to independent research projects and graduate studies. Students will also explore the practical requirements and limitations of scientific research. Laboratory and field safety, animal care, intellectual property and research ethics will be reviewed. Students will be required to practice both oral presentation and writing skills as core components of their evaluation.

*Prerequisite(s): Completion of 7.50 credits including (1 of GEOG\*2460, STAT\*2040 , STAT\*2060, STAT\*2080)*

*Restriction(s): Enrollment in the BSC(AGR), BBRM, BSC.ABIO, BSC.PLSC or Minor in Agriculture.*

*Department(s): Department of Plant Agriculture, Department of Animal Biosciences*

### 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 BSC(Agr.), BBRM and Agricultural Business students.

*Prerequisite(s): 5.00 credits*

*Restriction(s): Instructor consent required.*

*Department(s): Department of Plant Agriculture*

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

This special study option 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 a 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.*

*Department(s): Department of Animal Biosciences*

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

This course provides for the 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. This course will normally be followed by AGR\*4460 to provide 2 semesters to complete the research project.

*Prerequisite(s):* 10.00 credits

*Restriction(s):* Permission of the course coordinator (contingent on the availability and agreement of a faculty advisor). BSC(Agr) or BSC or BBRM, 70% cumulative average.

*Department(s):* Dean's Office, Ontario Agricultural College

**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.

*Department(s):* Dean's Office, Ontario Agricultural College

**AGR\*4600 Agriculture and Food Issues Problem Solving W (3-0) [1.00]**

The issues facing the agriculture and food sector are many and varied and relate to the economy, the environment and society. Within these issues there are problems which require thoughtful solutions. Working in teams, with guidance from faculty advisors, students will have an opportunity to develop solutions to real-world problems facing the agriculture and food sector. In the process students will have an opportunity to develop their research, communication, presentation, writing and group work skills.

*Prerequisite(s):* 12.50 credits

*Restriction(s):* Registration in BSC(AGR), BBRM, BCOMM.FAB, B.COMM.FAB:C or BA.FARE program.

*Department(s):* Department of Plant Agriculture

## **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 Biosciences*

### ANSC\*1210 Principles of Animal Care and Welfare W (4.5-0) [1.00]

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.

*Prerequisite(s): BIOL\*1050*

*Restriction(s): ANSC\*3210 .*

*Department(s): Department of Animal Biosciences*

### 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\*1050, BIOL\*1070, BIOL\*1080, BIOL\*1090)]*

*Restriction(s): Not available to students registered in BBRM.EQM program.*

*Department(s): Department of Animal Biosciences*

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

This course is an introduction to anatomy and carcass structure of farm animals. Consideration is given to the major systems in the body and the whole range of animal structure from molecular biology to commercial carcass grading. The course provides a basic understanding of factors such as meat tenderness, adipose development in the carcass, abnormalities of meat quality such as PSE pork and dark-cutting beef, and carcass composition.

*Offering(s): Also offered through Distance Education format.*

*Prerequisite(s): 2 of BIOL\*1050, BIOL\*1070, BIOL\*1080, BIOL\*1090*

*Department(s): Department of Animal Biosciences*

### ANSC\*3040 Animal Reproduction W (3-3) [0.50]

This course takes a multi-species approach to understanding the basic principles of animal reproduction. Both the anatomy and the physiology of reproductive systems are explored in agricultural, companion and wildlife species with an emphasis on animals under human management. In addition, the development and application of assisted reproductive technologies (ART) for animal management are introduced.

*Prerequisite(s): ANSC\*3080*

*Department(s): Department of Animal Biosciences*

### 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.

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

*Department(s): Department of Animal Biosciences*

### 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 or EQN\*2040*

*Restriction(s): Registration in BSC(Agr), BSC.ABIO or BBRM.EQM, Minor in Agriculture.*

*Department(s): Department of Animal Biosciences*

### 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.

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

*Restriction(s): Registration in BSC(Agr) or BSC.ABIO*

*Department(s): Department of Animal Biosciences*

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

This course examines growth, digestive and metabolic processes, nutritional requirements and practical feeding programs for fish and crustaceans with an emphasis on those species used in aquaculture.

*Prerequisite(s): NUTR\*3210*

*Department(s): Department of Animal Biosciences*

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

This course is a study of the nutrition of avian and mammalian wildlife with emphasis on North American species and the role of nutrition in survival and population growth of wildlife in their natural habitat.

*Prerequisite(s): NUTR\*3210*

*Department(s): Department of Animal Biosciences*

### ANSC\*3270 Animal Disorders W (3-0) [0.50]

This course will highlight common causes of infectious, metabolic and psychological/neurological disorders of domestic and companion animals, and their potential impact on animal welfare and production. Disorders will be addressed in the context of pathophysiology, transmission, and prevention strategies involving environmental enrichment, vaccination, biosecurity, nutrition, and genetic selection.

*Prerequisite(s): ANSC\*3080*

*Department(s): Department of Animal Biosciences*

### ANSC\*4010 Animal Welfare Judging and Evaluation F (0-3) [0.50]

This course provides senior level students with a structured opportunity to practice assessing animal welfare using scientific evidence. Students learn to present their evaluations in a logical and persuasive manner. They learn general criteria and approaches used to assess welfare and then apply that knowledge for assessment of four different species in practical settings.

*Prerequisite(s): 15.00 credits including ANSC\*1210, ANSC\*3080*

*Co-requisite(s): ANSC\*4090*

*Restriction(s): ANSC\*4230. Instructor consent required.*

*Department(s): Department of Animal Biosciences*

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

The course will provide an overview of how biotechnology has impacted biomedical science and animal production. Important principles of recombinant DNA, DNA marker identification, stem cell biology, and generation of transgenic animals will be emphasized. The current challenges and potential opportunities in biotechnology will also be discussed.

*Prerequisite(s): MBG\*2040 or MBG\*2400*

*Department(s): Department of Animal Biosciences*

### 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*

*Department(s): Department of Animal Biosciences*

### 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*

*Department(s): Department of Animal Biosciences*

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

This course will provide senior level students with experience in working as a team to propose solutions to dairy cattle industry problems. Teams of students will critically assess dairy cattle-related businesses at the farm or industry level under the supervision of a faculty member.

*Prerequisite(s): ANSC\*3080, ANSC\*3120, MBG\*3060*

*Restriction(s): Instructor consent required.*

*Department(s): Department of Animal Biosciences*

### 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*

*Department(s): Department of Animal Biosciences*

**ANSC\*4270 Dairy Cattle Nutrition F (3-2) [0.50]**

Students will learn how nutrients are transformed from feed into milk and bodies of dairy animals. There will be an emphasis on feed management on farms and developing skills in formulation and evaluation of rations using computer models.

*Prerequisite(s):* ANSC\*3120

*Department(s):* Department of Animal Biosciences

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

This course is designed to evaluate basic and applied poultry nutrition. Students will learn nutrient requirements of poultry, feeding value of ingredients used in poultry feed formulation and how feeding affects the environment, growth, reproduction, health, and composition of poultry products for human consumption.

*Prerequisite(s):* ANSC\*3120

*Department(s):* Department of Animal Biosciences

**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

*Department(s):* Department of Animal Biosciences

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

This course provides an opportunity for directed hands-on projects involving live animals and laboratory techniques. A set of selected projects will be provided by Animal Biosciences faculty within their broad fields of study, for example animal behaviour and welfare, environmental physiology, endocrinology, and reproduction.

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

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

*Restriction(s):* Restricted to students in BSCH.ABIO, BSAG.ANSC. Instructor consent required.

*Department(s):* Department of Animal Biosciences

**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\*3210

*Department(s):* Department of Animal Biosciences

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

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

*Prerequisite(s):* ANSC\*3080

*Department(s):* Department of Animal Biosciences

**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\*3210

*Department(s):* Department of Animal Biosciences

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

Students are guided to independently research and critically review a topic of emerging importance in animal biosciences. Students select a topic in consultation with the instructor.

*Prerequisite(s):* 15.00 credits including 2.00 in ANSC or EQN

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Animal Biosciences

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

This course gives an overview of the immune defense mechanisms of domestic species, and to compare common and unique defense strategies developed for resisting microbial and viral infections. Topics include innate and acquired immunity, evolution of the immune system, immunoregulation, and the host response to pathogen invasion.

*Prerequisite(s):* ANSC\*3080

*Department(s):* Department of Animal Biosciences

**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 or Animal Science Major.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Animal Biosciences

**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 or Animal Science Major.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Animal Biosciences

## 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.

*Department(s):* Department of Sociology and Anthropology

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

This course deals 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.

*Offering(s):* Also offered through Distance Education format.

*Department(s):* Department of Sociology and Anthropology

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

Using case studies and ethnographies, this course explores the application of anthropological theory and practice to diverse cross-cultural public issues. Topics of discussion will include some of the following: indigenous rights, international development, social marginalization, health and wellbeing, and gender relations.

*Prerequisite(s):* ANTH\*1150

*Department(s):* Department of Sociology and Anthropology

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

This course offers a survey of ethnographic studies on selected cultural/geographical area(s) 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.

*Prerequisite(s):* ANTH\*1150

*Department(s):* Department of Sociology and Anthropology

### 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

*Department(s):* Department of Sociology and Anthropology

### ANTH\*3550 Medical Anthropology W (3-0) [0.50]

This course provides an introduction to medical anthropology and the anthropology of health. We will examine theory, methods, practice, and contemporary and historical topical issues.

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

*Department(s):* Department of Sociology and Anthropology

### 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

*Department(s):* Department of Sociology and Anthropology

### ANTH\*3690 Engaging Anthropological Theory F (3-0) [0.50]

This course offers an analysis of the main trends in anthropological theory and practice. Areas of discussion will include the crisis of representation, interpretive anthropology, feminist anthropology, and agency and structure debates.

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

*Department(s):* Department of Sociology and Anthropology

### ANTH\*3770 Kinship, Family, and Power W (3-0) [0.50]

This course explores the changing nature of what it means to be a family from anthropological and cross-cultural perspectives. Topics of discussion include kinship, descent, marriage, our relationships to ancestors, gender and power relations, and the politics of kinship ties. In addition, the course considers the relevance of kinship to contemporary issues such as gay, lesbian, bisexual and transgendered families, the use of reproductive technologies, and international adoptions.

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

*Department(s):* Department of Sociology and Anthropology

### 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

*Department(s):* Department of Sociology and Anthropology

### 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

*Department(s):* Department of Sociology and Anthropology

### 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.

*Department(s):* Department of Sociology and Anthropology

### 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

*Department(s):* Department of Sociology and Anthropology

### 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

*Department(s):* Department of Sociology and Anthropology

### 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

*Department(s):* Department of Sociology and Anthropology

**ANTH\*4550 Topics in the Anthropology of Health F (3-0) [0.50]**

This seminar focuses on the anthropological analyses of medical and health issues among current and past populations. The course is based on case studies. It will provide students with a grounding in the theoretical approaches appropriate to anthropological considerations of issues relating to health.

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

*Department(s):* Department of Sociology and Anthropology

**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

*Department(s):* Department of Sociology and Anthropology

**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

*Department(s):* Department of Sociology and Anthropology

**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

*Department(s):* Department of Sociology and Anthropology

**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

*Department(s):* Department of Sociology and Anthropology

**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.

*Department(s):* Department of Sociology and Anthropology

**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.

*Department(s):* Department of Sociology and Anthropology

**ANTH\*4900 Honours Anthropology Thesis I S,E,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.

*Department(s):* Department of Sociology and Anthropology

**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.

*Department(s):* Department of Sociology and Anthropology

## Arabic

*School of Languages and Literature*

### **ARAB\*1100 Introductory Arabic I F (3-0) [0.50]**

This course provides an introduction to Arabic script, articulation of the sounds, basic grammar, and is designed to enable students to begin communicating in Modern Standard Arabic (MSA).

*Restriction(s):* Arabic speakers are not permitted to register for this class.

*Department(s):* School of Languages and Literatures

### **ARAB\*1110 Introductory Arabic II W (3-0) [0.50]**

This course is a continuation of Introductory Arabic I with emphasis on oral work. Heritage speakers of Arabic may be admitted with permission of the instructor.

*Prerequisite(s):* ARAB\*1100

*Restriction(s):* Arabic speakers are not permitted to register for this class.

*Department(s):* School of Languages and Literatures

## 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\*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.

*Department(s): School of Fine Art and Music*

### 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.

*Department(s): School of Fine Art and Music*

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

This course is an introduction to the study of visual culture and theory from South and Central America, Mexico and the Caribbean featuring art from the 20th century to the present.

*Offering(s): Offered in odd-numbered years.*

*Prerequisite(s): 2.00 credits or (ARTH\*1510 or ARTH\*1520)*

*Department(s): School of Fine Art and Music*

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

This course offers 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, ethnocentrism, and aboriginal viewpoints.

*Prerequisite(s): 2.00 credits or (ARTH\*1510 or ARTH\*1520)*

*Department(s): School of Fine Art and Music*

### 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): 2.00 credits or (ARTH\*1510 or ARTH\*1520)*

*Department(s): School of Fine Art and Music*

### 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.

*Prerequisite(s): 2.00 credits or (ARTH\*1510 or ARTH\*1520)*

*Department(s): School of Fine Art and Music*

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

This course is 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): 2.00 credits or (ARTH\*1510 or ARTH\*1520)*

*Equate(s): CLAS\*2150*

*Department(s): School of Fine Art and Music*

### ARTH\*2220 The Visual Arts Today F (3-0) [0.50]

This course is an introduction to contemporary visual culture, its current controversies and its historical roots. The avant-garde 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.

*Prerequisite(s): 2.00 credits or (ARTH\*1510 or ARTH\*1520)*

*Restriction(s): ARTH\*1220 This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations. See department for more information.*

*Department(s): School of Fine Art and Music*

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

This course is an investigation of architectural theory and practice within the social and spatial complexities of national and international life.

*Offering(s): Offered in odd-numbered years.*

*Prerequisite(s): 2.00 credits or (ARTH\*1510 or ARTH\*1520)*

*Department(s): School of Fine Art and Music*

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

This course is an introduction to the history of photography through to its application in contemporary visual arts.

*Offering(s): Offered through Distance Education format only.*

*Prerequisite(s): 2.00 credits*

*Department(s): School of Fine Art and Music*

### 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.

*Prerequisite(s): 2.00 credits or (ARTH\*1510 or ARTH\*1520)*

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

*Department(s): School of Fine Art and Music*

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

This course provides 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): 2.00 credits or (ARTH\*1510 or ARTH\*1520)*

*Department(s): School of Fine Art and Music*

### 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): 2.00 credits or (ARTH\*1510 or ARTH\*1520)*

*Department(s): School of Fine Art and Music*

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

This course will investigate the art, architecture, and visual and material culture of Renaissance Italy in its political, social, religious, intellectual and theoretical contexts. Topics can include artistic training and practice; methods, materials and techniques of art-making; science and perspective; patronage; collectors and collecting; public monuments and domestic art; Renaissance theory; humanism; artistic biography; and other thematic contexts.

*Prerequisite(s): 2.00 credits or (ARTH\*1510 or ARTH\*1520)*

*Department(s): School of Fine Art and Music*

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

This is a study of the historical avant-gardes in the social and political contexts of the period 1900-1950.

*Offering(s): Offered in even-numbered years.*

*Prerequisite(s): 2.00 credits or (ARTH\*1510 or ARTH\*1520)*

*Department(s): School of Fine Art and Music*

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

This course is a study of visual culture as it was transformed by the revolutions - industrial, political, and colonial - of the eighteenth and nineteenth centuries.

*Prerequisite(s): 2.00 credits or (ARTH\*1510 or ARTH\*1520)*

*Department(s): School of Fine Art and Music*

**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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 2.00 credits or (ARTH\*1510 or ARTH\*1520)

*Department(s):* School of Fine Art and Music

**ARTH\*3010 Contemporary Canadian Art F (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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 7.50 credits or 1.50 credits in Art History.

*Department(s):* School of Fine Art and Music

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

This course explores the ideas, designs and processes of artworks and projects conceptualized to be situated or staged in public spaces. The objective of this course is to identify and investigate the contexts surrounding selected works of public art, which may include media works, sculpture, and landscape installation, from a global perspective.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 7.50 credits or 1.50 credits in Art History.

*Department(s):* School of Fine Art and Music

**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).

*Offering(s):* Offered in even-numbered years.

*Equate(s):* CLAS\*3150

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

*Department(s):* School of Fine Art and Music

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

This course explores the role colour has played in the work of selected artists and periods.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 7.50 credits or 1.50 credits in Art History.

*Department(s):* School of Fine Art and Music

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

This course will provide an in-depth examination of the critical issues driving contemporary art. Though the specific topic will vary, the goal of this course is to establish a facility with the fundamental terms by which to analyze the cultural, economic, technological and visual conditions that shape the artworks of our time.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 7.50 credits or 1.50 credits in Art History, including ARTH\*2480.

*Department(s):* School of Fine Art and Music

**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).

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 7.50 credits or 1.50 credits in Art History.

*Department(s):* School of Fine Art and Music

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 7.50 credits or 1.50 credits in Art History.

*Department(s):* School of Fine Art and Music

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

This course examines the role of images in sacred and secular contexts: manuscripts, reliquaries, architectural sculpture, tapestries, and liturgical display in Romanesque and Gothic Europe.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 7.50 credits or 1.50 credits in Art History.

*Department(s):* School of Fine Art and Music

**ARTH\*3340 Studies in Renaissance and Baroque Art F (3-0) [0.50]**

This course considers selected topics in the Renaissance and/or Baroque period(s), with emphasis on the political, social, economic, gendered, and aesthetic meanings of works of art.

*Prerequisite(s):* 7.50 credits or 1.50 credits in Art History.

*Department(s):* School of Fine Art and Music

**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

*Department(s):* School of Fine Art and Music

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

This course provides 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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 7.50 credits or 1.50 credits in Art History.

*Department(s):* School of Fine Art and Music

**ARTH\*3600 Topics in the Long Eighteenth Century W (3-0) [0.50]**

This course examines themes and issues in European art and visual culture of the long eighteenth century (1680s-1830s) through case-studies in select national, regional and/or global contexts that engage with artists' careers, institutions related to artistic practice, and relevant theoretical and critical discourses.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 7.50 credits or 1.50 credits in Art History.

*Restriction(s):* ARTH\*3310

*Department(s):* School of Fine Art and Music

**ARTH\*3620 Museum Studies F (0-0) [0.50]**

This seminar course will be offered in conjunction with the staff and facilities of the Gallery of Guelph 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 Gallery.

*Prerequisite(s):* 7.50 credits or 1.50 credits in Art History.

*Restriction(s):* ARTH\*4620 .

*Department(s):* School of Fine Art and Music

**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.

*Offering(s):* Offered in even-numbered years.

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

*Department(s):* School of Fine Art and Music

**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 depending on the expertise of the instructor. Students should consult the department for specific offerings.

*Prerequisite(s):* 10.00 credits including 1.00 credits in Art History at the 3000 level.

*Department(s):* School of Fine Art and Music

**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 depending on the expertise of the instructor. Students should consult the department for specific offerings.

*Prerequisite(s):* 10.00 credits including 1.00 credits in Art History at the 3000 level.

*Department(s):* School of Fine Art and Music

**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 depending on the expertise of the instructor. Students should consult the department for specific offerings.

*Prerequisite(s):* 10.00 credits including 1.00 credits in Art History at the 3000 level.

*Department(s):* School of Fine Art and Music

**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 depending on the expertise of the instructor. Students should consult the department for specific offerings.

*Prerequisite(s):* 10.00 credits including 1.00 credits in Art History at the 3000 level.

*Department(s):* School of Fine Art and Music

**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 depending on the expertise of the instructor. Students should consult the department for specific offerings.

*Prerequisite(s):* 10.00 credits including 1.00 credits in Art History at the 3000 level.

*Department(s):* School of Fine Art and Music

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

Each student establishes, in consultation with the faculty member who has agreed to supervise the course, the content of this special study within the area of expertise of that instructor. Students should plan their project and submit their proposal to the Director of the School (or designate) by the last day of classes in the semester prior to the one which they plan to enroll in ARTH\*4600.

*Prerequisite(s):* 14.00 credits, including 6 credits in Art History.

*Restriction(s):* Instructor consent required.

*Department(s):* School of Fine Art and Music

**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 required.

*Department(s):* School of Fine Art and Music

## 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\*1110 Society and Inquiry I F (3-0) [0.50]

Through a series of historical and/or current case studies, this course introduces students to the ways in which social forces interact with inquiry. Students learn how to locate, present and critically evaluate evidence. This course also introduces students to the importance of good academic conduct and accountability in their work.

*Prerequisite(s): ASCI\*1000*

*Restriction(s): Registration in the BAS degree program.*

*Department(s): Dean's Office, College of Arts*

### ASCI\*1120 Society and Inquiry II W (3-0) [0.50]

Through a series of historical and/or current case studies, students will continue to explore the ways in which social forces shape inquiry. Students will learn to balance the weight of evidence from multiple sources and present those findings both orally and in writing.

*Prerequisite(s): ASCI\*1110*

*Equate(s): ASCI\*1010*

*Restriction(s): Registration in the BAS degree program.*

*Department(s): Dean's Office, College of Arts*

### ASCI\*2050 Uses of Knowledge F (3-0) [0.50]

This course explores the ways in which academic knowledge can be transferred, translated and mobilized to the world and used to remedy social problems. Through historical and/or current case studies and using the knowledge acquired in their two minors, students will learn to assess and defend conflicting points of view both in written and oral formats. Through group exercises, students will learn to work collaboratively and envisage themselves as engaged citizens.

*Prerequisite(s): ASCI\*1120*

*Equate(s): ASCI\*2000*

*Restriction(s): Registration in the BAS degree program.*

*Department(s): Dean's Office, College of Arts*

### 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 or ASCI\*2050*

*Restriction(s): Registration in the BAS degree program.*

*Department(s): Dean's Office, College of Arts*

### 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 or ASCI\*2050*

*Restriction(s): Registration in the BAS degree program.*

*Department(s): Dean's Office, College of Arts*

### ASCI\*3200 Issues in Public Health S (3-0) [0.50]

This course examines the practice of public health in Canada, and throughout the world, with an emphasis on the impact of social and political forces on matters relating to public health. As well, the course considers strategies for the delivery of initiatives to safeguard the health of the public.

*Offering(s): Offered through Distance Education format only.*

*Prerequisite(s): 8.50 credits*

*Department(s): Dean's Office, College of Arts*

### 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 BAS degree program. Instructor consent required.*

*Department(s): Dean's Office, College of Arts*

### ASCI\*4010 Arts and Sciences Honours Research Seminar W (3-0) [1.00]

Under faculty supervision students will devise and research a topic, and then plan, develop, peer-edit and complete a major paper. 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): 12.00 credits, including (1 of ASCI\*3000, ASCI\*3100, ASCI\*3200, ASCI\*3700); cumulative average of 75%*

*Restriction(s): ASCI\*4000 Registration in the BAS degree program.*

*Department(s): Dean's Office, College of Arts*

### 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 or ASCI\*2050)*

*Restriction(s): Registration in the BAS degree program.*

*Department(s): Dean's Office, College of Arts*

### 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 or ASCI\*2050)*

*Restriction(s): Registration in the BAS degree program.*

*Department(s): Dean's Office, College of Arts*

### 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 BAS degree program. Instructor consent required.*

*Department(s): Dean's Office, College of Arts*

### 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 BAS degree program. Instructor consent required.*

*Department(s): Dean's Office, College of Arts*

## 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

*Department(s):* Department of Molecular and Cellular Biology

### **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

*Department(s):* Department of Molecular and Cellular Biology

### **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

*Department(s):* Department of Molecular and Cellular Biology

### **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

*Department(s):* Department of Molecular and Cellular Biology

### **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

*Department(s):* Department of Molecular and Cellular Biology

### **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

*Department(s):* Department of Molecular and Cellular Biology

## Biology

*Department of Human Health and Nutritional Sciences*

*Department of Molecular and Cellular Biology*

*Department of Plant Agriculture*

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

This course will introduce concepts concerning the organization of life, from molecules to cells to ecosystems and discuss how they relate to day-to-day life. The dynamic and interactive nature of all living systems will be emphasized. The weekly tutorial will introduce students to the application of biology to daily life and emphasize critical thinking skills. This course will be valuable for students without Grade 12 or 4U Biology who are interested in environmental issues, medicine, agriculture, biodiversity and related topics.

*Restriction(s): BIOL\*1050, BIOL\*1070, BIOL\*1080, BIOL\*1090*

*Department(s): Department of Integrative Biology, Department of Molecular and Cellular Biology*

### **BIOL\*1050 Biology of Plants & Animals in Managed Ecosystems F (3-2) [0.50]**

In this course students will investigate the biology of plants and animals in the context of agroecosystems and other managed ecosystems. Students will learn about the form and function of plants and animals and interactions between organisms and their environments. The course strongly emphasizes participatory and self-directed learning, problem solving, reasoning and exposure to primary research literature and will address key concepts in evolution, plant and animal structure, physiology and ecology. Students lacking Grade 12 or 4U Biology should consult with their program counsellor prior to taking BIOL\*1050 in first semester.

*Department(s): Department of Plant Agriculture, Department of Animal Biosciences*

### **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.

*Department(s): Department of Integrative Biology*

### **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.

*Department(s): Department of Human Health and Nutritional Sciences*

### **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.

*Department(s): Department of Molecular and Cellular Biology*

### **BIOL\*1500 Humans in the Natural World 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.

*Offering(s): Also offered through Distance Education format.*

*Restriction(s): Students in the BAS, BSC and BSC(ENV) program cannot take this course for credit.*

*Department(s): Department of Integrative Biology*

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

This course discusses 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 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.

*Offering(s): Also offered through Distance Education format.*

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

*Department(s): Department of Integrative Biology*

### **BIOL\*2400 Evolution F,W (3-0) [0.50]**

This course provides a broad overview of evolutionary biology. It examines the concepts and mechanisms that explain evolutionary change and the evolution of biological diversity at different levels of biological organization (gene to ecosystem) and across space and time. It also introduces historical forms of scientific inquiry, unique to biology. The course is designed to be of interest to students with general interests in science and in research in all areas of biology.

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

*Department(s): Department of Integrative Biology*

### **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 with 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.

*Prerequisite(s): BIOL\*2060, (STAT\*2040 or STAT\*2230)*

*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 BSc Academic Advising website: <http://www.bsc.uoguelph.ca/> for more information.*

*Department(s): Department of Integrative Biology*

### **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.

*Prerequisite(s): MBG\*2040*

*Department(s): Department of Integrative Biology*

### **BIOL\*3040 Methods in Evolutionary Biology W (2-2) [0.50]**

This course will provide students with an understanding of some of the major analytical approaches used in modern evolutionary biology and an appreciation of the relevance of these methods to other branches of the life sciences. This includes the analysis of molecular data, phylogenetics and “tree thinking”, population genetics, genomics, phenotypic selection, experimental evolution, and hypothesis generation and testing in historical sciences. In addition to lectures, laboratory sessions will be devoted to practical training in analytical tools using specialized computer software and real datasets. Students will also be exposed to recent scientific literature and will undertake an independent project in order to experience these approaches in action.

*Prerequisite(s): BIOL\*2400*

*Department(s): Department of Integrative Biology*

### **BIOL\*3060 Populations, Communities & Ecosystems W (4-0) [0.50]**

This course will explore advanced topics in ecology, building on the foundation provided by BIOL\*2060. The course material will be organized around common mechanisms that link ecological processes across levels of organization, such as organism function, species interactions, spatial connectivity and energetic transfers across trophic levels. Emphasis will be on testing ecological theory with quantitative analysis of empirical data, thereby gaining greater depth of understanding of ecological processes at the population, community and ecosystem scales. Through the examination of case studies, students will apply ecological knowledge and quantitative analysis to problem solving in areas such as resource management, conservation of populations and communities, and predicting biosphere responses to climate change.

*Prerequisite(s): 10.00 credits including BIOL\*2060, (1 of GEOG\*2460, STAT\*2040, STAT\*2060, STAT\*2230)*

*Department(s): Department of Integrative Biology*

**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.

*Prerequisite(s): BIOL\*2060*

*Department(s): Department of Integrative Biology*

**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.

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

*Department(s): Department of Plant Agriculture*

**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.

*Prerequisite(s): BIOL\*1070, CHEM\*1050, ZOO\*2700 is strongly recommended*

*Department(s): Department of Integrative Biology*

**BIOL\*3650 Applications in Biology W (3-0) [0.50]**

In this course, students will explore selected topics related to the application of biological knowledge and techniques in society, such as biotechnology, forensic science, conservation biology, agriculture, health care, public health, and wildlife biology. Different topics are offered each year, reflecting the particular research or professional interest of the course instructor. Upcoming topics will be posted on the B.Sc. Advising and CBS-ADA websites.

*Prerequisite(s): 9.00 credits including (2 of BIOL\*1070, BIOL\*1080, BIOL\*1090)*

*Restriction(s): This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations during certain periods. Please refer to the CBS ADA website.*

*Department(s): Dean's Office, College of Business and Economics*

**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.

*Co-requisite(s): ZOO\*3210 or ZOO\*3620*

*Department(s): Department of Integrative Biology*

**BIOL\*4110 Ecological Methods F (3-3) [1.00]**

This course will examine the theoretical and practical aspects of research methods in ecology. Emphasis will be placed on experimental design, sampling, population estimation, statistical inference, and 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.

*Prerequisite(s): BIOL\*3010, BIOL\*3060, (STAT\*2040 or STAT\*2230)*

*Restriction(s): Restricted to students in BSCH.WBC and Ecology majors/minors*

*Department(s): Department of Integrative Biology*

**BIOL\*4120 Evolutionary Ecology W (4-0) [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.

*Prerequisite(s): BIOL\*2060, BIOL\*2400*

*Department(s): Department of Integrative Biology*

**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.

*Prerequisite(s): BIOL\*3060 or BIOL\*3130*

*Department(s): Department of Integrative Biology*

**BIOL\*4350 Limnology of Natural and Polluted Waters F (3-3) [0.50]**

This course will familiarize students with the characteristics and methods of study of the limnology of natural and polluted aquatic ecosystems. The laboratory includes methods of biological, chemical and physical assessment such as field surveys of algal, macrophyte and benthic invertebrate diversity, toxicity assays, and analyses of stream flow.

*Prerequisite(s): BIOL\*3450*

*Department(s): Department of Integrative Biology*

**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): 0.50 credits in ecology*

*Restriction(s): Instructor consent required.*

*Department(s): Department of Integrative Biology*

**BIOL\*4500 Natural Resource Policy Analysis W (3-0) [0.50]**

This course explores the role of science in management decision-making for Canadian renewable natural resources, including legal, political, social and economic factors. The course will rely on active learning by students working in collaborative groups, leading to deeper understanding of real-world issues while developing professional skills that are essential for those who wish to make significant contributions at the science-management interface. Four themes will be explored: 1) acts/policies/guidelines, 2) science and other knowledge systems, 3) management strategy evaluation, and 4) decision analysis & adaptive management.

*Prerequisite(s): 15.00 credits including BIOL\*4150*

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

*Department(s): Department of Integrative Biology*

**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.

*Offering(s): Offered in even-numbered years.*

*Prerequisite(s): BIOL\*2060*

*Restriction(s): Instructor consent required.*

*Department(s): Department of Integrative Biology*

**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\*2060*

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

*Department(s): Department of Integrative Biology*

**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\*2060*

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

*Department(s): Department of Integrative Biology*

**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\*2060*

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

*Department(s): Department of Integrative Biology*

**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\*2060*

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

*Department(s): Department of Integrative Biology*

**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\*2060*

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

*Department(s): Department of Integrative Biology*

## 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. (Also offered through Distance Education format.)

**Restriction(s):** ANSC\*3080, BIOM\*3200, HK\*2810, HK\*3940, ZOO\*3200, ZOO\*3210, ZOO\*3600 Not available to BSC Students in biological science specializations or BAS program.

**Department(s):** Department of Biomedical Sciences

#### BIOM\*3000 Functional Mammalian Neuroanatomy F (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\*3200, HK\*3810, HK\*3940, NEUR\*2000, PHYS\*2030, PSYC\*2410, ZOO\*3200, ZOO\*3600

**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 department of Biomedical Sciences website for more information.

**Department(s):** Department of Biomedical Sciences

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

This lecture and laboratory course is designed for students interested in the biomedical and health sciences. Labs provide an introduction to veterinary anatomy, with small and large animal dissections. Human and clinical veterinary anatomy, as well as biomechanical and functional differences are considered.

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

**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 department of Biomedical Sciences website for more information.

**Department(s):** Department of Biomedical Sciences

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

The patterns and principles of normal embryonic and fetal development of mammals are covered with an emphasis on comparison to adult anatomy and medical implications. In laboratories, the teratology of prenatal anomalies are also examined. There is a focus on gathering embryological information and developing scientific reasoning skills through essays and presentations.

**Prerequisite(s):** (BIOL\*1070, BIOL\*1090), (1 of BIOL\*1080, BIOM\*3200, HK\*3810, HK\*3940), (1 of BIOM\*3010, HK\*3401, HK\*3501, ZOO\*2090)

**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 department of Biomedical Sciences website for more information.

**Department(s):** Department of Biomedical Sciences

#### BIOM\*3090 Principles of Pharmacology S,F,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.

**Offering(s):** Also offered through Distance Education format.

**Prerequisite(s):** BIOC\*2580, (1 of ANSC\*3080, BIOM\*3200, HK\*3810, HK\*3940, ZOO\*3200, ZOO\*3600)

**Department(s):** Department of Biomedical Sciences

#### BIOM\*3200 Biomedical Physiology S,F,W (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.

**Offering(s):** Also offered through Distance Education format.

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

**Restriction(s):** HK\*3940. This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the department of Biomedical Sciences website for more information.

**Department(s):** Department of Biomedical Sciences

#### BIOM\*3210 Critical Thinking in the Health Sciences 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 and its clinical applications. Topics will include critical thinking, critical appraisal of the medical literature, the principles of evidence based medicine, and selected issues related to scientific integrity.

**Prerequisite(s):** 7.50 credits including (1 of BIOL\*1070, BIOL\*1080, BIOL\*1090)

**Restriction(s):** BIOM\*4210

**Department(s):** Department of Biomedical Sciences

#### 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\*3200, HK\*3810, HK\*3940, ( ZOO\*3200 , ZOO\*3210 ), ZOO\*3600]

**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 department of Biomedical Sciences website for more information.

**Department(s):** Department of Biomedical Sciences

#### BIOM\*4050 Biomedical Aspects of Aging W (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\*3200, HK\*3810, HK\*3940

**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 department of Biomedical Sciences website for more information.

**Department(s):** Department of Biomedical Sciences

#### BIOM\*4070 Biomedical Histology F (2-3) [0.50]

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):** (MCB\*2050 or MCB\*2210 ), (1 of ANSC\*3080, BIOM\*3200, HK\*3810, HK\*3940 )

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

**Department(s):** Department of Biomedical Sciences

#### BIOM\*4090 Pharmacology S,F,W (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.

**Offering(s):** Also offered through Distance Education format.

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

**Department(s):** Department of Biomedical Sciences

**BIOM\*4110 Mammalian Reproductive Biology W (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\*3401, HK\*3501, ZOO\*2090), (1 of BIOM\*3200, HK\*3810, HK\*3940, ZOO\*3210, ZOO\*3620), (BIOM\*4070 or ZOO\*3000)

*Department(s):* Department of Biomedical Sciences

**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):* MBG\*2040, MCB\*2050, (1 of BIOM\*3040, BIOM\*4070, ZOO\*3000)

*Department(s):* Department of Biomedical Sciences

**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):* (1 of BIOM\*3200, HK\*3810, HK\*3940), (1 of BIOM\*3010, HK\*3401, HK\*3501, ZOO\*2090)

*Restriction(s):* Registration in the BSC.BIOM Major.

*Department(s):* Department of Biomedical Sciences

**BIOM\*4300 Biomedical Communications F (3-0) [0.50]**

The primary purpose of this course is to develop students' ability to communicate scientific information logically and concisely, in written and oral formats. Students will be taught the basic principles underlying logical development of scientific arguments and hypotheses. Using practical examples drawn from current scientific literature, students will be exposed to the methods currently used by scientists in researching their subjects and writing about them in an effective fashion. Through written and oral presentation assignments, students will develop the skills necessary to confidently develop scientific presentations and communicate their knowledge and ideas to others.

*Prerequisite(s):* 14.00 credits including BIOL\*1080, STAT\*2040

*Restriction(s):* Restricted to students in BSCH:BIOM.

*Department(s):* Department of Biomedical Sciences

**BIOM\*4500 Literature-based Research in Biomedical Sciences S,F,W (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 BSC.BIOM majors or BSC.NEUR minors.

*Department(s):* Department of Biomedical Sciences

**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 BSC.BIOM majors.

*Department(s):* Department of Biomedical Sciences

**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.

*Department(s):* Department of Biomedical Sciences

**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.

*Department(s):* Department of Biomedical Sciences

**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

*Department(s):* Department of Biomedical Sciences

## 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, B.A.S. Program, B.SC. (ENV.) or B.SC. (AGR.) Programs.

*Restriction(s): BIOL\*1050*

*Department(s): Department of Plant Agriculture*

### 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.

*Offering(s): Also offered through Distance Education format.*

*Prerequisite(s): BIOL\*1050 or BIOL\*1070*

*Restriction(s): BOT\*1200*

*Department(s): Department of Plant Agriculture*

### 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.

*Prerequisite(s): 2 of BIOL\*1050, BIOL\*1070, BIOL\*1080, BIOL\*1090*

*Department(s): Department of Molecular and Cellular Biology*

### 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 wildlife biology and environmental management.

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

*Department(s): Department of Integrative Biology*

### 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.

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

*Department(s): Department of Molecular and Cellular Biology*

### 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.

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

*Department(s): Department of Molecular and Cellular Biology*

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

This course integrates 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 wildlife and environmental management.

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

*Department(s): Department of Integrative Biology*

### 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.

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

*Department(s): Department of Molecular and Cellular Biology*

## Business

*Department of Management*

<b>BUS*4550 Applied Business Project I S,F,W (3-0) [0.50]</b>
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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):* AGEC\*4550 , FARE\*4550 Instructor consent required.

*Department(s):* Department of Management

<b>BUS*4560 Applied Business Project II S,F,W (3-0) [0.50]</b>
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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):* AGEC\*4560 , FARE\*4560 Instructor consent required.

*Department(s):* Department of Management

## 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

*Department(s):* Department of Chemistry

#### **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

*Department(s):* Department of Chemistry

#### **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.

*Offering(s):* Offered through Distance Education format only.

*Department(s):* Department of Chemistry

#### **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.

*Offering(s):* Offered through Distance Education format only.

*Restriction(s):* CHEM\*1040 Students in the BASC.AHN, BAS, BBRM.EM, BENG, BSAG, BSES and BSC programs cannot take this course for credit.

*Department(s):* Department of Chemistry

#### **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, [IPS\*1510 or (MATH\*1210, (1 of PHYS\*1010, PHYS\*1070, PHYS\*1300))]

*Department(s):* Department of Chemistry

#### **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

*Department(s):* Department of Chemistry

#### **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 This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the department website for more information.

*Department(s):* Department of Chemistry

#### **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 This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the department website for more information.

*Department(s):* Department of Chemistry

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

This course provides an introduction to organic chemistry through the discussion of stereochemistry and major reaction mechanisms such as nucleophilic substitution and elimination, electrophilic addition, free radical reactions, electrophilic aromatic substitution, nucleophilic addition and nucleophilic acyl substitution.

*Prerequisite(s):* CHEM\*1050

*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.

*Department(s):* Department of Chemistry

#### **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, (1 of IPS\*1510, MATH\*1210, MATH\*2080)

*Restriction(s):* CHEM\*2880, PHYS\*2240

*Department(s):* Department of Chemistry

#### **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 IPS\*1500, MATH\*1000 , MATH\*1080, MATH\*1200)

*Restriction(s):* CHEM\*2820

*Department(s):* Department of Chemistry

#### **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.)

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* CHEM\*1050

*Equate(s):* TOX\*3360

*Department(s):* Department of Chemistry

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

This course examines 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)

*Restriction(s):* TOX\*3300

*Department(s):* Department of Chemistry

#### **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

*Department(s):* Department of Chemistry

#### **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

*Department(s):* Department of Chemistry

#### **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

*Department(s):* Department of Chemistry

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

This course provides continued 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

*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.

*Department(s):* Department of Chemistry

**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\*3750

*Department(s):* Department of Chemistry

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

This course provides an introduction to quantum chemistry and how it applies to the understanding of the electronic structure of atoms and molecules, as well as the geometric structure of molecules. The theoretical background needed to understand molecular spectroscopy is also provided. An integral part of this course is the use of commercial software for the computation of molecular properties.

*Prerequisite(s):* CHEM\*2070, ( MATH\*2170 or MATH\*2270 )

*Department(s):* Department of Chemistry

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* CHEM\*3860, ( MATH\*2150 or MATH\*2160 )

*Department(s):* Department of Chemistry

**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\*2700, (CHEM\*3430 or TOX\*3300), (1 of IPS\*1510, MATH\*1210, MATH\*2080)

*Department(s):* Department of Chemistry

**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

*Department(s):* Department of Chemistry

**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

*Department(s):* Department of Chemistry

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

This course covers the role and importance of transition metal systems in biological processes.

*Offering(s):* Offered in odd-numbered years.

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

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

*Department(s):* Department of Chemistry

**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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* CHEM\*3760

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

*Department(s):* Department of Chemistry

**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

*Department(s):* Department of Chemistry

**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

*Department(s):* Department of Chemistry

**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.

*Offering(s):* Offered in even-numbered years.

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

*Department(s):* Department of Chemistry

**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.

*Department(s):* Department of Chemistry

**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.

*Department(s):* Department of Chemistry

## 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.

*Department(s):* School of Languages and Literatures

#### **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. Students with basic knowledge of Chinese may seek instructor consent.

*Prerequisite(s):* CHIN\*1200

*Department(s):* School of Languages and Literatures

#### **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.

*Department(s):* School of Languages and Literatures

#### **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. Students with basic knowledge of Chinese may seek instructor consent.

*Prerequisite(s):* CHIN\*1280

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

*Department(s):* School of Languages and Literatures

#### **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.

*Department(s):* School of Languages and Literatures

#### **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.

*Department(s):* School of Languages and Literatures

#### **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.

*Department(s):* School of Languages and Literatures

## 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.

*Department(s): School of Languages and Literatures*

### CLAS\*2000 Classical Mythology W,S (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.

*Offering(s): Also offered through Distance Education format.*

*Department(s): School of Languages and Literatures*

### 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*

*Department(s): School of Languages and Literatures*

### 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.

*Offering(s): Offered in odd-numbered years.*

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

*Department(s): School of Languages and Literatures*

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

This course augments CLAS\*2350 for students of Latin through the reading and study in Latin of certain primary sources, in particular Cicero, Quintilian, Augustine.

*Offering(s): Offered in odd-numbered years.*

*Prerequisite(s): LAT\*2000*

*Department(s): School of Languages and Literatures*

### 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.

*Offering(s): Offered in even-numbered years.*

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

*Department(s): School of Languages and Literatures*

### 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.

*Offering(s): Offered in even-numbered years.*

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

*Department(s): School of Languages and Literatures*

### 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.

*Offering(s): Offered in odd-numbered years.*

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

*Department(s): School of Languages and Literatures*

### 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.

*Offering(s): Offered in odd-numbered years.*

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

*Department(s): School of Languages and Literatures*

### 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 Aischylos, Sophokles, and Euripides. Comedy, fantasy, and society in Aristophanes.

*Offering(s): Offered in even-numbered years.*

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

*Department(s): School of Languages and Literatures*

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

This course augments CLAS\*3000 for students of Greek through the reading and study in Greek of selected primary sources, such as Herodotus, Thucydides, and Plutarch.

*Offering(s): Offered in even-numbered years.*

*Prerequisite(s): GREK\*2020*

*Department(s): School of Languages and Literatures*

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

This course augments CLAS\*3010 for students of Latin through the reading and study in Latin of selected primary sources, notably Sallust, Cicero, Caesar, and Suetonius.

*Offering(s): Offered in even-numbered years.*

*Prerequisite(s): LAT\*2000*

*Department(s): School of Languages and Literatures*

### CLAS\*3070 History of the Hellenistic World (in Greek) F (6-0) [1.00]

This course augments CLAS\*3020 for students of Greek through the reading and study in Greek of selected Greek sources pertaining to the history of the Hellenistic World, primarily Polybius and Plutarch.

*Offering(s): Offered in odd-numbered years.*

*Prerequisite(s): GREK\*2020*

*Department(s): School of Languages and Literatures*

### CLAS\*3080 Epic Heroes and Poems (in Greek) W (6-0) [1.00]

This course augments CLAS\*3030 for students of Greek 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.

*Offering(s): Offered in odd-numbered years.*

*Prerequisite(s): GREK\*2020*

*Department(s): School of Languages and Literatures*

### CLAS\*3090 Greek Tragedy and Comedy (in Greek) W (6-0) [1.00]

This course augments CLAS\*3040 for students of Greek through the reading and study in Greek of an extant play.

*Offering(s): Offered in even-numbered years.*

*Prerequisite(s): GREK\*2020*

*Department(s): School of Languages and Literatures*

### 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.

*Offering(s): Offered in even-numbered years.*

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

*Department(s): School of Languages and Literatures*

### CLAS\*3120 Religion in Greece and Rome (in Latin) F (6-0) [1.00]

This course augments CLAS\*3100 for students of Latin through the reading and study of Latin primary sources.

*Offering(s): Offered in even-numbered years.*

*Prerequisite(s): LAT\*2000*

*Department(s): School of Languages and Literatures*

### 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).

*Offering(s): Offered in even-numbered years.*

*Equate(s): ARTH\*3150*

*Department(s): School of Languages and Literatures*

**CLAS\*3300 Directed Reading in Greek or Latin U (3-0) [0.50]**

This course is designed for students of Greek or Latin who are seeking an enriched learning opportunity, through directed reading and/or research in the original language (Greek or Latin). Consult the Classical Studies 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):* Instructor consent required.

*Department(s):* School of Languages and Literatures

**CLAS\*3700 Experiential Learning and Language S,F,W (0-0) [0.50]**

This course provides an opportunity for independent study based on an experiential project in Classical Studies. The project (approximately 70 hours) must be approved by a faculty member in the School of Languages and Literatures. It will include research about experiential learning, a reflective piece of writing and a public oral presentation about the project.

*Prerequisite(s):* 10.00 credits including 1.50 credits in Classics.

*Restriction(s):* A minimum cumulative average of 70% in all Classics course attempts.  
Instructor consent required.

*Department(s):* School of Languages and Literatures

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* CLAS\*3030 or CLAS\*3040

*Department(s):* School of Languages and Literatures

**CLAS\*4010 Novel and Romance in Antiquity (in Latin) F (6-0) [1.00]**

This course augments CLAS\*4000 for students of Latin through the reading and study in Latin of an extant novel.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* LAT\*2000

*Department(s):* School of Languages and Literatures

**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

*Department(s):* School of Languages and Literatures

**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

*Department(s):* School of Languages and Literatures

## Computing and Information Science

### School of Computer 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 emphasizes application packages for personal and business use.

*Offering(s): Offered through Distance Education format only.*

*Restriction(s): CIS\*1200, Not available to students registered in B.A.Sc. Program (Applied Human Nutrition major), B.Comp. degree or a CIS minor.*

*Department(s): School of Computer Science*

#### 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 and is intended for students who wish a balance between programming and the use of software packages.

*Offering(s): Offered through Distance Education format only.*

*Restriction(s): CIS\*1000 Not available to students registered in a B.Comp. degree or a CIS minor.*

*Department(s): School of Computer Science*

#### 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.

*Restriction(s): Restricted to students in BCOMP:CS and BCOMP:CS:C with 2.50 or fewer credits and to students in BCOMP:SENG and BCOMP:SENG:C*

*Department(s): School of Computer Science*

#### CIS\*1500 Introduction to Programming F,W (3-2) [0.50]

This course introduces 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. The course is designed 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 most CIS courses.

*Offering(s): Also offered through Distance Education format.*

*Department(s): School of Computer Science*

#### CIS\*1910 Discrete Structures in Computing I W (3-2) [0.50]

This course is an introduction to discrete structures and formal methodologies used in computer science, including Boolean, algebra, propositional logic, predicate logic, proof techniques, set theory, equivalence relations, order relations, and functions.

*Department(s): School of Computer Science*

#### 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\*1910, CIS\*2500*

*Department(s): School of Computer Science*

#### 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.

*Offering(s): 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.*

*Department(s): School of Computer Science*

#### 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*

*Department(s): School of Computer Science*

#### 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*

*Restriction(s): Restricted to Software Engineering majors.*

*Department(s): School of Computer Science*

#### 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*

*Department(s): School of Computer Science*

#### 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, STAT\*2040*

*Department(s): School of Computer Science*

#### CIS\*2500 Intermediate Programming W (3-2) [0.50]

In this course students learn to interpret a program specification and implement it as reliable code, as they gain experience with pointers, complex data types, important algorithms, intermediate tools and techniques in problem solving, programming, and program testing.

*Prerequisite(s): CIS\*1500*

*Department(s): School of Computer Science*

#### CIS\*2520 Data Structures S,F (3-2) [0.50]

This course is a study of basic data structures, such as lists, stacks, queues, trees, and tables. Topics which will be examined include abstract data types, sequential and linked representations, and an introduction to algorithm analysis; various traversals, search, insertion, removal, and sorting algorithms.

*Offering(s): Also offered through Distance Education format.*

*Prerequisite(s): CIS\*2500, (CIS\*1910 or ENGG\*1500)*

*Department(s): School of Computer Science*

#### CIS\*2750 Software Systems Development and Integration W (3-2) [0.75]

This course introduces techniques and tools used in the development of large software systems. Students learn methods for organizing and constructing modular systems, manipulating files, introductory interface design, and use of databases. Software tools for managing projects, database connectivity, configuration management, and system application programmer interfaces are also covered.

*Prerequisite(s): CIS\*2430, CIS\*2520*

*Department(s): School of Computer Science*

#### CIS\*2910 Discrete Structures in Computing II F (3-2) [0.50]

This course is a further introduction to discrete structures and formal methodologies used in computer science, including sequences, summations, recursion, combinatorics, discrete probability, and graph theory.

*Prerequisite(s): CIS\*1500, (CIS\*1910 or ENGG\*1500)*

*Department(s): School of Computer Science*

#### 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.*

*Department(s): School of Computer Science*

**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

*Department(s):* School of Computer Science

**CIS\*3110 Operating Systems I W (3-1) [0.50]**

This course covers operating systems in theory and practice by focusing on the components in a system: scheduling, resource allocation, process management, multi-programming, multi-tasking, I/O control, file systems, and mechanisms for client-server computing using examples from contemporary operating systems.

*Prerequisite(s):* CIS\*2520, (CIS\*2030 or ENGG\*2410).

*Department(s):* School of Computer Science

**CIS\*3120 Digital Systems I 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\*1910, CIS\*2500

*Department(s):* School of Computer Science

**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\*2750, CIS\*3490

*Department(s):* School of Computer Science

**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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* CIS\*2500 or work experience in a related field.

*Department(s):* School of Computer Science

**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 only covered at a functional level.

*Prerequisite(s):* CIS\*3110

*Department(s):* School of Computer Science

**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.

*Prerequisite(s):* CIS\*2250, CIS\*2500

*Department(s):* School of Computer Science

**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.

*Prerequisite(s):* CIS\*2750, CIS\*3250, CIS\*3760

*Department(s):* School of Computer Science

**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\*1910 or (CIS\*2910 and ENGG\*1500)], CIS\*2520

*Department(s):* School of Computer Science

**CIS\*3530 Data Base Systems and Concepts F (3-1) [0.50]**

This course is a study of data organization and data management principles with the perspective of analyzing applications suitable for implementation using a DBMS. This will include an 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 will demonstrate concepts through project assignments.

*Prerequisite(s):* CIS\*2520

*Department(s):* School of Computer Science

**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)

*Department(s):* School of Computer Science

**CIS\*3750 System Analysis and Design in Applications F,W (3-2) [0.75]**

This course is an introduction to the issues and techniques encountered in the design and construction of software systems, focusing on 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

*Department(s):* School of Computer Science

**CIS\*3760 Software Engineering F,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\*3750

*Department(s):* School of Computer Science

**CIS\*4050 Digital Systems II F (3-1) [0.50]**

This course examines central processor architectures, control and microprogramming, memory systems, special architectures, underlying support for special architectures, architectures suitable for very large scale integration.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* CIS\*3110, CIS\*3120

*Department(s):* School of Computer Science

**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

*Department(s):* School of Computer Science

**CIS\*4250 Software Design V W (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.

*Prerequisite(s):* CIS\*2750, CIS\*3260

*Department(s):* School of Computer Science

**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)

*Department(s):* School of Computer Science

**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)*

*Department(s): School of Computer Science*

**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 searching, automatic indexing, database query optimization and system support, web based retrieval.

*Offering(s): Offered in even-numbered years. And may be offered in odd-numbered years.*

*Prerequisite(s): CIS\*3110, CIS\*3530, (CIS\*3750 or CIS\*3760)*

*Department(s): School of Computer Science*

**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 School of Computer Science to determine what topic will be offered during specific semesters and which prerequisites, if any, are appropriate.

*Restriction(s): Instructor consent required.*

*Department(s): School of Computer Science*

**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 School of Computer Science to determine what topic will be offered during specific semesters and which prerequisites, if any, are appropriate.

*Restriction(s): Instructor consent required.*

*Department(s): School of Computer Science*

**CIS\*4510 Computer Security Foundations F (3-2) [0.50]**

This course covers basic concepts and practices in computer and network security. This includes topics such as fundamental concepts of computer security, network security, threat landscape, threat intelligence and attack methods, ethical hacking concepts and other hacking techniques, security technology and security policies, and cloud security.

*Prerequisite(s): CIS\*3210*

*Restriction(s): CIS\*4110*

*Department(s): School of Computer Science*

**CIS\*4520 Introduction to Cryptography W (3-2) [0.50]**

This course is an introduction to the foundations of modern cryptography, with an eye toward practical applications. Topics covered include classical systems, information theory, mathematical background material, symmetric and asymmetric crypto-systems and their cryptanalysis, hash functions and message authentication (MAC), provable security, key-exchange and management, authentication and digital signatures. Importance of learning Cryptography in Digital Forensics will also be discussed

*Prerequisite(s): CIS\*3490*

*Restriction(s): CIS\*4110*

*Department(s): School of Computer Science*

**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*

*Department(s): School of Computer Science*

**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.

*Offering(s): Offered in odd-numbered years.*

*Prerequisite(s): CIS\*2750, CIS\*3110, (CIS\*2460 or STAT\*2040)*

*Department(s): School of Computer Science*

**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.

*Offering(s): Offered in odd-numbered years.*

*Prerequisite(s): (CIS\*3750 or CIS\*3760), CIS\*3490, (CIS\*2460 or STAT\*2040)*

*Department(s): School of Computer Science*

**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.

*Offering(s): Offered in even-numbered years.*

*Prerequisite(s): CIS\*3110, (CIS\*3750 or CIS\*3760)*

*Department(s): School of Computer Science*

**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.

*Offering(s): Offered in odd-numbered years.*

*Prerequisite(s): CIS\*3110, (CIS\*3750 or CIS\*3760)*

*Department(s): School of Computer Science*

**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.*

*Department(s): School of Computer Science*

**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.*

*Department(s): School of Computer Science*

## Co-operative Education

### *Co-operative Education & Career Services*

*COOP\*XXXX courses are limited to students registered in a co-operative education program.*

#### **COOP\*1100 Introduction to Co-operative Education F,W (1-0) [0.00]**

This course will introduce students to the theory, practice and policies 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 professional work environments, 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.

*Offering(s): Offered through Distance Education format only.*

*Prerequisite(s): 2.00 credits*

*Restriction(s): Enrolment in a co-operative education program*

*Department(s): Co-operative Education & Career Services*

#### **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 work term is varied. Refer to the schedule of studies for your degree program to determine which semester this course is scheduled. Students must obtain a passing work report evaluation and work performance evaluation grade in order to continue in the Co-op Program.

*Prerequisite(s): COOP\*1100*

*Department(s): Co-operative Education & Career Services*

#### **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 work term is varied. Refer to the schedule of studies for your degree program to determine which semester this course is scheduled. Students must obtain a passing work report evaluation and work performance evaluation grade in order to continue in the Co-op Program.

*Prerequisite(s): Completion of previous co-op work requirements in COOP\*1000*

*Department(s): Co-operative Education & Career Services*

#### **COOP\*3000 Co-op Work Term III 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 work term is varied. Refer to the schedule of studies for your degree program to determine which semester this course is scheduled. Students must obtain a passing work report evaluation and work performance evaluation grade in order to continue in the Co-op Program.

*Prerequisite(s): Completion of previous co-op work requirements in COOP\*2000*

*Department(s): Co-operative Education & Career Services*

#### **COOP\*4000 Co-op Work Term IV 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 work term is varied. Refer to the schedule of studies for your degree program to determine which semester this course is scheduled. Students must obtain a passing work report evaluation and work performance evaluation grade in order to continue in the Co-op Program.

*Prerequisite(s): Completion of previous co-op work requirements in COOP\*3000*

*Department(s): Co-operative Education & Career Services*

#### **COOP\*5000 Co-op Work Term V 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 work term is varied. Refer to the schedule of studies for your degree program to determine which semester this course is scheduled. Students must obtain a passing work report evaluation and work performance evaluation grade in order to continue in the Co-op Program.

*Prerequisite(s): Completion of previous co-op work requirements in COOP\*4000*

*Department(s): Co-operative Education & Career Services*

## Crop Science

*Department of Plant Agriculture*

### **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.

*Prerequisite(s): AGR\*2050 or AGR\*2470*

*Department(s): Department of Plant Agriculture*

### **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.

*Prerequisite(s): AGR\*2050 or AGR\*2470*

*Department(s): Department of Plant Agriculture*

### **CROP\*3340 Managed Grasslands F (3-2) [0.50]**

Managed forage grasses and legumes provide grazing, cover crops, 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 and equine production and environmental management. Forage species will be distinguished morphologically and physiologically, focusing on adaptation to climatic, edaphic, and managerial constraints and applications for horses, including weed and poisonous plant risks. Topics will include: sward lifespan, establishment and maintenance practices, forage quality indices, integration of harvest management for pastures and stored feed, and environmental implications for plant and animal biodiversity and water quality.

*Prerequisite(s): 1 of AGR\*2050, AGR\*2320, AGR\*2470, ENVS\*2060*

*Department(s): Department of Plant Agriculture*

### **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): (1 of CROP\*3300, CROP\*3310, CROP\*3340), (1 of AGR\*2320, ENVS\*3080, ENVS\*4090, SOIL\*3080 , SOIL\*4090 )*

*Department(s): Department of Plant Agriculture*

### **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\*2470*

*Department(s): Department of Plant Agriculture*

### **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%. Instructor consent required.*

*Department(s): Department of Plant Agriculture*

## 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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* ECON\*1200

*Department(s):* Department of Economics and Finance

#### **ECON\*1100 Introductory Macroeconomics S,F,W (3-0) [0.50]**

This course looks at the Canadian Economy in terms of aggregate performance and policy; analysis of the determinants of national income, employment and the price level, and the role of government monetary and fiscal policies in improving the rate of economic growth.

*Offering(s):* Also offered through Distance Education format.

*Department(s):* Department of Economics and Finance

#### **ECON\*2100 Economic Growth and Environmental Quality F (3-0) [0.50]**

This course examines the implications of economic growth on the quality of the environment, employing the basic principles of economic analysis.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* ECON\*1050 or FARE\*1040

*Department(s):* Department of Economics and Finance

#### **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

*Department(s):* Department of Economics and Finance

#### **ECON\*2310 Intermediate Microeconomics S,F,W (3-0) [0.50]**

This course is an analysis of the behaviour of households and firms under alternative assumptions and market conditions.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* (ECON\*1050 or FARE\*1040), (1 of IPS\*1500, MATH\*1030, MATH\*1080, MATH\*1200)

*Department(s):* Department of Economics and Finance

#### **ECON\*2410 Intermediate Macroeconomics S,F,W (3-0) [0.50]**

This course is an analysis of open as well as closed economy models of aggregate spending, output, employment, prices and interest rates under alternative assumptions about the nature of labour, product and financial markets. This includes theories of consumption, investment and money demand.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* ECON\*1100, (1 of IPS\*1500, MATH\*1030, MATH\*1080, MATH\*1200)

*Department(s):* Department of Economics and Finance

#### **ECON\*2420 Canadian Economic History W (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)

*Department(s):* Department of Economics and Finance

#### **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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* ECON\*1050, (1 of , IPS\*1500, MATH\*1030, MATH\*1080, MATH\*1200), (1 of ECON\*2740, PSYC\*1010, PSYC\*2010, SOAN\*2120, STAT\*2040, STAT\*2060, STAT\*2080, STAT\*2120)

*Restriction(s):* ECON\*3460 , ECON\*3560

*Department(s):* Department of Economics and Finance

#### **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

*Department(s):* Department of Economics and Finance

#### **ECON\*2720 Business History W (3-0) [0.50]**

This course surveys the evolution of economic activity and organization from before 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)

*Department(s):* Department of Economics and Finance

#### **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\*1100, (ECON\*1050, or FARE\*1040), (1 of MATH\*1000 , MATH\*1030, MATH\*1050 , MATH\*1080, MATH\*1200)

*Department(s):* Department of Economics and Finance

#### **ECON\*2770 Introductory Mathematical Economics F,W (3-0) [0.50]**

This course applies the elements of calculus and matrix algebra to simple microeconomic and macroeconomic problems.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* ECON\*1100, (ECON\*1050, or FARE\*1040), (1 of MATH\*1030, MATH\*1080, MATH\*1200)

*Department(s):* Department of Economics and Finance

#### **ECON\*3100 Game Theory W (4-0) [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

*Department(s):* Department of Economics and Finance

#### **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)

*Department(s):* Department of Economics and Finance

**ECON\*3360 The Strategy of Mergers and Acquisitions F (3-0) [0.50]**

As changes occur in product markets, public policy, and technology, the scope and scale required for companies to be competitive often changes as well. This course examines the role of mergers and acquisitions (M&A) in repositioning companies to remain competitive, to grow, or to exit. The course also examines how M&A can create value across a range of company types and situations. A means of assessment of M&A success or failure is provided and the course outlines the processes and skills required for successful M&A strategies, relevant to executives and supporting professional services in most industries today.

*Prerequisite(s):* ECON\*2310, ECON\*2410, ECON\*2560

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

*Department(s):* Department of Economics and Finance

**ECON\*3400 The Economics of Personnel Management U (3-0) [0.50]**

In this course, we examine the economics of personnel management in organizations. Using mainstream microeconomic and behavioural economic theory, we will consider such issues as recruitment, promotion, financial and non-financial incentives, compensation, job performance, performance evaluation, and investment in personnel. The interplay between theoretical models and empirical evidence will be emphasized in considering different approaches to the management of personnel.

*Prerequisite(s):* ECON\*2310 or ECON\*2200

*Department(s):* Department of Economics and Finance

**ECON\*3500 Urban Economics W (3-0) [0.50]**

Land is a scarce resource and is an input into production and consumption. Transportation costs are important and the structure of a city has real effects on the economic and social activities that occur in it. This course discusses how the price of a good varies by location, how the market price of a property varies over time, and how the structure of cities responds to market forces. The course discusses some public policy and managerial implications of the location dimension.

*Prerequisite(s):* ECON\*2310

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

*Department(s):* Department of Economics and Finance

**ECON\*3520 Labour Economics F (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)

*Department(s):* Department of Economics and Finance

**ECON\*3530 Industrial Organization F (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)

*Department(s):* Department of Economics and Finance

**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

*Department(s):* Department of Economics and Finance

**ECON\*3610 Public Economics W (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

*Department(s):* Department of Economics and Finance

**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

*Department(s):* Department of Economics and Finance

**ECON\*3660 Economics of Equity Markets F,W (3-0) [0.50]**

This course studies the economic literature regarding the determination of security prices and the operation of the stock market.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* ECON\*2310, ECON\*2560

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

*Department(s):* Department of Economics and Finance

**ECON\*3710 Advanced Microeconomics F,W (4-0) [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.

*Department(s):* Department of Economics and Finance

**ECON\*3730 The Origins of International Inequality W (3-0) [0.50]**

This course surveys the world economy with a particular focus on the industrial revolution, demographic change, the rise to prominence of 'settler colonies', globalization and the origins of international inequality.

*Prerequisite(s):* 9.00 credits including ECON\*1050, ECON\*1100

*Department(s):* Department of Economics and Finance

**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)

*Department(s):* Department of Economics and Finance

**ECON\*3760 Fundamentals of Derivatives W (3-0) [0.50]**

This course provides an introduction to the analysis of financial derivatives. It covers the theory and application of forward contract, futures, options, and swaps, and explains how these instruments can be used for purposes such as investment, hedging risk, arbitrage and speculation.

*Prerequisite(s):* ECON\*2310, ECON\*2560

*Restriction(s):* AGEC\*4240 , FARE\*4240 This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations. See department for more information.

*Department(s):* Department of Economics and Finance

**ECON\*3810 Advanced Macroeconomics W (4-0) [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)

*Department(s):* Department of Economics and Finance

**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.

*Prerequisite(s):* ECON\*2410, ECON\*2560

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

*Department(s):* Department of Economics and Finance

**ECON\*3960 Money, Credit and the Financial System W (3-0) [0.50]**

This course explores the economics of banking, other financial institutions and credit markets.

*Prerequisite(s):* ECON\*2410, ECON\*2560

*Department(s):* Department of Economics and Finance

**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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* ECON\*2310 Students must have completed a minimum of 12 credits.

*Department(s):* Department of Economics and Finance

**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)

*Department(s):* Department of Economics and Finance

**ECON\*4560 Advanced Topics in Finance W (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, ECON\*3710, (1 of ECON\*3100, ECON\*3810, ECON\*4700), ECON\*3740, (2 of ECON\*3360, ECON\*3660, ECON\*3760, FARE\*4240, ECON\*3860, ECON\*3960)

*Department(s):* Department of Economics and Finance

**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

*Department(s):* Department of Economics and Finance

**ECON\*4660 Risk Management in Finance and Insurance U (3-0) [0.50]**

This course covers the advanced theory and applications of derivatives (for underlying assets such as equity and debt instruments, real assets and exchange rate instruments) and insurance in managing risk.

*Prerequisite(s):* ECON\*3710, (1 of ECON\*3360, ECON\*3660, ECON\*3760, ECON\*3860, ECON\*3960, FARE\*4240)

*Department(s):* Department of Economics and Finance

**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\*3710, ECON\*3740

*Department(s):* Department of Economics and Finance

**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

*Department(s):* Department of Economics and Finance

**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)

*Department(s):* Department of Economics and Finance

**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

*Department(s):* Department of Economics and Finance

**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)

*Department(s):* Department of Economics and Finance

**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

*Department(s):* Department of Economics and Finance

**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)

*Department(s):* Department of Economics and Finance

**ECON\*4800 Competitiveness and Strategic Advantage F,W (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 ( BUS\*3320 or MGMT\*3320), ECON\*2310, ECON\*2560

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

*Department(s):* Department of Economics and Finance

**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

*Department(s):* Department of Economics and Finance

**ECON\*4830 Economic Development W (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

*Department(s):* Department of Economics and Finance

**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

*Department(s):* Department of Economics and Finance

**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

*Department(s):* Department of Economics and Finance

**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):* (1 of or ECON\*3610, ECON\*3810, ECON\*3860), (ECON\*3710 or ECON\*3620)

*Department(s):* Department of Economics and Finance

**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

*Department(s):* Department of Economics and Finance

**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

*Department(s):* Department of Economics and Finance

**ECON\*4910 Special Study in Economics S,F,W (3-0) [0.50]**

Same description as for ECON\*4900.

*Department(s):* Department of Economics and Finance

**ECON\*4930 Environmental Economics F (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

*Department(s):* Department of Economics and Finance

## 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. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* School of Environmental Design and Rural Development

### 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.

*Offering(s):* Offered through Distance Education format only.

*Department(s):* School of Environmental Design and Rural Development

### EDRD\*2250 Planning Theory and Practice F (3-0) [0.50]

The course links the body of planning theory to the Canadian experience of local planning practice. It provides an introduction to the issues of planning in the public realm and its role in implementation of the development of municipalities through both growth as well as decline. This is achieved by examining planning theory and reflecting on the context and process of planning in practice in Canada. The student in the course will come to understand both the role of theory in guiding practice as well as the role of practice in evolution of theory. This understanding is critical to the role of the professional planner in facilitating local development and managing change in the public interest.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 2.00 credits

*Department(s):* School of Environmental Design and Rural Development

### 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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 5.00 credits

*Department(s):* School of Environmental Design and Rural Development

### 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

*Department(s):* School of Environmental Design and Rural Development

### 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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 5.00 credits

*Restriction(s):* REXT\*3100

*Department(s):* School of Environmental Design and Rural Development

### EDRD\*3140 Organizational Communication W (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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 5.00 credits

*Restriction(s):* REXT\*3040

*Department(s):* School of Environmental Design and Rural Development

### 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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 10.00 credits

*Restriction(s):* REXT\*3060

*Department(s):* School of Environmental Design and Rural Development

### 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):* 10.00 credits

*Department(s):* School of Environmental Design and Rural Development

### 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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 10.00 credits

*Equate(s):* UNIV\*3400

*Department(s):* School of Environmental Design and Rural Development

### 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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 10.00 credits

*Equate(s):* UNIV\*3500

*Department(s):* School of Environmental Design and Rural Development

### 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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 5 credits

*Department(s):* School of Environmental Design and Rural Development

### 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

*Department(s):* School of Environmental Design and Rural Development

### 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

*Department(s):* School of Environmental Design and Rural Development

**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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 10.00 credits

*Restriction(s):* REXT\*4100 .

*Department(s):* School of Environmental Design and Rural Development

# 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 F (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.

*Restriction(s): Registration in the B.Eng. Program*

*Department(s): School of Engineering*

### 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*

*Department(s): School of Engineering*

### 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.

*Department(s): School of Engineering*

### 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*

*Department(s): School of Engineering*

### 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*

*Department(s): School of Engineering*

### ENGG\*2120 Material Science F,W (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*

*Department(s): School of Engineering*

### 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*

*Department(s): School of Engineering*

### ENGG\*2180 Introduction to Manufacturing Processes W (3-2) [0.50]

This course is designed to provide students with an overview of a wide variety of manufacturing processes involved in industrial activities. While most of the manufacturing processes are to be introduced during the course, more emphasis will be given on those processes which are more common in industry, namely material removal processes, casting, and forming. In addition to introducing the various manufacturing process, mathematical models and several empirical data and equations describing the various manufacturing processes will be covered in order to provide the students with a better understanding of the relations between the parameters involved.

*Prerequisite(s): ENGG\*2160*

*Co-requisite(s): ENGG\*2120*

*Department(s): School of Engineering*

### ENGG\*2230 Fluid Mechanics F,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*

*Department(s): School of Engineering*

### 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, 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.

*Prerequisite(s): ENGG\*1210*

*Department(s): School of Engineering*

### 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*

*Department(s): School of Engineering*

### 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*

*Department(s): School of Engineering*

### 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 including switched circuits; alternate-current circuits and sinusoidal steady-state analysis with phasor methods.

*Prerequisite(s): ENGG\*2400, (PHYS\*1010 or PHYS\*1130)*

*Department(s): School of Engineering*

### 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): 5.00 credits including CHEM\*1040*

*Department(s): School of Engineering*

**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

*Department(s):* School of Engineering

**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; and applications in biomedicine, food and bioprocessing.

*Prerequisite(s):* ENGG\*2400, MATH\*2270, (1 of BIOL\*1070, BIOL\*1080, BIOL\*1090)

*Department(s):* School of Engineering

**ENGG\*3050 Embedded Reconfigurable Computing Systems F (3-2) [0.50]**

This course introduces the students to the analysis, synthesis and design of embedded systems and the implementation of embedded systems 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\*2410, ENGG\*3380

*Department(s):* School of Engineering

**ENGG\*3070 Integrated Manufacturing Systems F (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

*Department(s):* School of Engineering

**ENGG\*3080 Energy Resources & Technologies F (3-2) [0.50]**

The challenges of changing the global energy system to reduce dependence on finite fossil energy sources, and transition to environmentally sustainable energy sources, are examined. The reserves, consumption, applications and environmental and human impacts of oil, coal and natural gas usage are examined. The fundamental principles, applications and status of a range of renewable energy sources and technologies will be covered to provide a solid background for further study of sustainable energy.

*Co-requisite(s):* ENGG\*3260

*Restriction(s):* ENGG\*2030

*Department(s):* School of Engineering

**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.

*Department(s):* School of Engineering

**ENGG\*3120 Computer Aided Design and Manufacturing W (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.

*Prerequisite(s):* ENGG\*2100, ENGG\*3280

*Department(s):* School of Engineering

**ENGG\*3130 Modelling Complex Systems W (3-2) [0.50]**

This course explores the application of systems thinking to complex global issues. Key topics will include: systems theory, complex adaptive systems, systems tools, and systems approaches. The course will emphasize the role of computational modelling and simulation as a central tool for applying systems thinking to real-world settings.

*Prerequisite(s):* CIS\*1500, ENGG\*2400, STAT\*2120

*Department(s):* School of Engineering

**ENGG\*3140 Mechanical Vibration F (3-3) [0.50]**

This course will provide students with an introduction to the fundamental concepts of vibration engineering using both single and multiple degrees of freedom concepts. The free and forced response of these systems will be covered. Emphasis will be placed on the design of vibration suppression and isolation of mechanical systems. Concepts of natural frequencies and mode shapes and their significance in the solution of multiple degrees of freedom problems will be covered. Vibration of rotating machinery, balancing, condition monitoring, and predictive vs. preventative maintenance philosophies will be introduced.

*Prerequisite(s):* ENGG\*2340, MATH\*2270

*Department(s):* School of Engineering

**ENGG\*3150 Engineering Biomechanics F (3-2) [0.50]**

The following topics related to biomechanics are covered in this course: kinematic and kinetic analysis techniques; electromyography; current techniques in laboratory instrumentation and biomedical applications.

*Prerequisite(s):* 4.00 ENGG credits, including ENGG\*1210

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**ENGG\*3170 Biomaterials W (3-2) [0.50]**

Physical properties of natural and synthetic (e.g. stainless steel, polymers) materials used in biological engineering applications are presented in this course. 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

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**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.

*Prerequisite(s):* ENGG\*2410

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**ENGG\*3220 Groundwater Engineering W (3-2) [0.50]**

This is an introductory course in groundwater engineering, an important area of practice for water resource and environmental engineers. The main goals of the course are: (1) to teach engineering students fundamental concepts in applied quantitative hydrogeology; and (2) to provide understanding of practical engineering tools and approaches for analysis including field and lab work.

*Prerequisite(s):* ENGG\*2230

*Department(s):* School of Engineering

**ENGG\*3240 Engineering Economics F (3-0) [0.50]**

This course covers the 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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* MATH\*1210

*Restriction(s):* Registration in the Engineering program.

*Department(s):* School of Engineering

**ENGG\*3250 Energy Management & Utilization W (3-2) [0.50]**

This course introduces notions of energy conservation and efficiency, an integrated approach to energy auditing and examples of typical applications (examples include: steam generation and distribution, process or comfort cooling, pumping and compressed air, human needs for modern living, energy consumption in buildings and industry). It also covers pinch technology and its application for energy recovery in industry, and methods to achieve low energy buildings.

*Co-requisite(s):* ENGG\*3430

*Restriction(s):* ENGG\*3030

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**ENGG\*3280 Machine Design F (3-3) [0.75]**

This course provides the concepts, procedures, and analysis techniques necessary to design various mechanical elements commonly found in machines. Failure analysis such as yield criteria and fatigue are covered. Component design includes screws, fasteners, shafts, bearings and lubrication, and gears. The emphasis is on the use of readily available materials, standard component, and appropriate design approaches to achieve safe and efficient system design.

*Prerequisite(s):* ENGG\*2120, ENGG\*2160, ENGG\*2230, ENGG\*2340, ENGG\*2450

*Department(s):* School of Engineering

**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)

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**ENGG\*3450 Electronic Devices F (3-2) [0.50]**

This course explores the theory and principles of modern electronic devices and their applications in circuits. Course topics include: intrinsic and doped semiconductors; drift and diffusion currents; metal-semiconductor contacts and MOS capacitors; pn junctions and breakdown phenomena; solid-state diodes; bipolar and MOS field-effect transistors; current-voltage characteristics and biasing; small-signal models and operation; circuit integration; analysis and design of application circuits, operational transconductance amplifiers, and logic gates.

*Prerequisite(s):* ENGG\*2450

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**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, and computer engineering. The course covers the following areas: (1) modeling of mechatronic systems (mechanical, electrical/electronic systems) and understanding their behaviour, (2) sensing and measurement including a variety of mechatronics sensors (fundamentals and applications), (3) actuators specific to mechatronics including motors and drivers (fundamentals and applications), (4) basic microcontroller programming as well as sensor/actuator integrations, and (5) control and its applications in mechatronics.

*Prerequisite(s):* ENGG\*2340, ENGG\*2450

*Co-requisite(s):* ENGG\*3410

*Department(s):* School of Engineering

**ENGG\*3510 Electromechanical Devices F (3-3) [0.50]**

The aim of this course is to develop an understanding of the electrical and electromechanical principles and their applications as 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. Semiconductors materials and devices, diodes, and transistors; principles of modern electronic devices and their applications in circuits; as well as operational amplifiers and digital logics are also studied.

*Prerequisite(s):* ENGG\*2450, PHYS\*1010

*Department(s):* School of Engineering

**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.

*Prerequisite(s):* ENGG\*2450, PHYS\*1010

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**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.

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**ENGG\*3700 Optimization for Engineers F (3-2) [0.50]**

This course serves as an introduction to optimization. Topics to be covered include but are not limited to: linear programming, sensitivity analysis, linear integer programming technique, dynamic programming, Markov chains, transportation method, decision analysis, and queuing theory.

*Prerequisite(s):* CIS\*1500, MATH\*2130, MATH\*2270

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**ENGG\*4000 Proposal for Engineering Design IV S,F,W (0-0) [0.00]**

In this course students will prepare a proposal for the design project that will be completed in the Engineering Design IV course in their program of study. Teams normally of 3 to 4 students (single student groups not allowed) will prepare the proposal, providing details on the proposed project, identify the group members and identify the faculty adviser, who has a P.Eng.. Students are responsible for creating their own design group and securing a faculty advisor.

*Prerequisite(s):* All 1000 and 2000 level core courses and ENGG\*3100

*Restriction(s):* Registration in semester preceding the last semester of the B.Eng. Program. Instructor consent required. Restriction waiver requests are handled by the Director, School of Engineering, or designate.

*Department(s):* School of Engineering

**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.

*Prerequisite(s):* ENGG\*2180, ENGG\*3070

*Department(s):* School of Engineering

**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.

*Prerequisite(s):* MATH\*1210, PHYS\*1130

*Restriction(s):* Restricted to students in BENG, BSCH.BMPH

*Department(s):* School of Engineering

**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: total quality management including relevant ISO regulations, six sigma, reliability, statistical process control, acceptance sampling and 2k factorial design of experiments.

*Prerequisite(s):* STAT\*2120

*Department(s):* School of Engineering

**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.

*Prerequisite(s):* ENGG\*3390

*Department(s):* School of Engineering

**ENGG\*4070 Life Cycle Assessment for Sustainable Design W (3-2) [0.50]**

This course will introduce students to the fundamental concepts related to interaction of industrial and environmental/ecological systems, sustainability challenges facing the current generation, and systems-based approaches required to create sustainable solutions for society. Students will understand the concepts and the scientific method as it applies to a systems-based, transdisciplinary approach to sustainability, and will be prepared to identify problems in sustainability and formulate appropriate solutions based on scientific research, applied science, social and economic issues. The basic concepts of life cycle assessment (LCA) will be discussed, along with life cycle inventory (LCI) and life cycle impact assessment (LCIA) including the social and economic dimensions. The application of life cycle assessment methodology using appropriate case studies will be presented.

*Prerequisite(s):* ENGG\*2100, ENGG\*3240

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**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.

*Prerequisite(s):* ENGG\*3070, ENGG\*3510, MICR\*1020

*Co-requisite(s):* ENGG\*2660, ENGG\*4050, ENGG\*4280

*Department(s):* School of Engineering

**ENGG\*4110 Biological Engineering Design IV F,W (2-6) [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. Students who have achieved a PASS in ENGG\*4000 are eligible for this course and will be added to the course prior to the first day of classes.

*Prerequisite(s):* ENGG\*4000

*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.

*Department(s):* School of Engineering

**ENGG\*4120 Engineering Systems and Computing Design IV F,W (2-6) [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. Students who have achieved a PASS in ENGG\*4000 are eligible for this course and will be added to the course prior to the first day of classes.

*Prerequisite(s):* ENGG\*4000

*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.

*Department(s):* School of Engineering

**ENGG\*4130 Environmental Engineering Design IV F,W (2-6) [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. Students who have achieved a PASS in ENGG\*4000 are eligible for this course and will be added to the course prior to the first day of classes.

*Prerequisite(s):* ENGG\*4000

*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.

*Department(s):* School of Engineering

**ENGG\*4150 Water Resources Engineering Design IV F,W (2-6) [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. Students who have achieved a PASS in ENGG\*4000 are eligible for this course and will be added to the course prior to the first day of classes.

*Prerequisite(s):* ENGG\*4000

*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.

*Department(s):* School of Engineering

**ENGG\*4160 Mechanical Engineering Design IV F,W (2-6) [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. Students who have achieved a PASS in ENGG\*4000 are eligible for this course and will be added to the course prior to the first day of classes.

*Prerequisite(s):* ENGG\*4000

*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.

*Department(s):* School of Engineering

**ENGG\*4170 Computer Engineering Design IV F,W (2-6) [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. Students who have achieved a PASS in ENGG\*4000 are eligible for this course and will be added to the course prior to the first day of classes.

*Prerequisite(s):* ENGG\*4000

*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.

*Department(s):* School of Engineering

**ENGG\*4180 Biomedical Engineering Design IV F,W (2-6) [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. Students who have achieved a PASS in ENGG\*4000 are eligible for this course and will be added to the course prior to the first day of classes.

*Prerequisite(s):* ENGG\*4000

*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.

*Department(s):* School of Engineering

**ENGG\*4200 Wireless Sensor Networks F (3-2) [0.50]**

This course focuses on the fundamentals behind the design of wireless sensor networks. Topics include node architecture, operating systems, prototypes and applications for wireless sensor networks. The course emphasizes basic architectural framework including physical layer, medium access control layer and network layer. It also covers network management topics such as power management, time synchronization and localization. The course has a number of experiments with sensor network software and hardware. The primary focus of the experiments is to give students hands-on programming experience with various microcontrollers and sensing platforms.

*Prerequisite(s):* ENGG\*3640

*Restriction(s):* ENGG\*4650

*Department(s):* School of Engineering

**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.

*Prerequisite(s):* ENGG\*3100

*Department(s):* School of Engineering

**ENGG\*4230 Energy Conversion F (3-3) [0.75]**

The course introduces the technical criteria for the design of efficient energy conversion processes and systems. It covers review of boilers and cycles, fuel and combustion calculations, and fundamentals of both traditional and emerging energy conversion processes and systems for production of thermal, mechanical, and electrical energy. Topics include fossil, biomass, nuclear fuels, wind, solar, geothermal and fuel cells. Mechanisms for storing energy generated from each of these systems are also studied. The course also discusses conversion of automobile, renovation of old fossil fuel fired plant, co-firing of opportunity fuel, waste to energy technology, emission, and economics of energy projects.

*Prerequisite(s):* ENGG\*3080, ENGG\*3260

*Restriction(s):* ENGG\*2050

*Department(s):* School of Engineering

**ENGG\*4240 Site Remediation F (3-1) [0.50]**

Remediation of contaminated sites is done to mitigate impacts to the environment and public health. The course will: review the applicable legislation; identify the important soil, water, air and chemical interactions; review the steps of an environmental risk assessment so that contaminated sites can be identified and evaluated to see if remediation is required; and evaluate and appraise various remediation technologies to complete the soil and groundwater remediation.

*Co-requisite(s):* ENGG\*3590, ENGG\*3670

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**ENGG\*4300 Food Processing Engineering Design W (3-2) [0.75]**

This course covers the formulation of mathematical models to describe food processing operations and the response of foods to such operations. Topics include: process evaluation; development and computer-aided design of operations such as thermal processes; and properties of various food forms.

*Prerequisite(s):* ENGG\*3260, ENGG\*3830

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**ENGG\*4380 Bioreactor Design F (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

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**ENGG\*4400 Biomechanical Engineering Design W (3-2) [0.75]**

This course covers concept development, design, modeling, manufacture and testing of biomechanical devices including athletic equipment, assistive devices, medical implants and tools. Other topics include the biomechanical factors influencing design, regulatory issues, current development trends, and the possible future direction of design and technology.

*Prerequisite(s):* 6.00 ENGG credits including ENGG\*3150, ENGG\*3170

*Department(s):* School of Engineering

**ENGG\*4420 Real-time Systems Design F (3-3) [0.75]**

This course teaches real-time concepts from a system and computing perspective covering topics related to four major areas. Real-time computer control and system modeling area teaches basic real-time design and system modeling concepts for hard and soft real-time computer control applications. Real-time Operating Systems (RTOS) area introduces common kernel objects and inter-task communication and synchronization using examples from current commercial RTOS. Topics in the area of scheduling present theoretical results related to uniprocessor and multiprocessor scheduling algorithms and topics in the area of fault tolerance and reliability present current techniques at software and hardware level.

*Prerequisite(s):* ENGG\*2400, ENGG\*3640

*Department(s):* School of Engineering

**ENGG\*4430 Neuro-Fuzzy and Soft Computing Systems W (3-0) [0.50]**

This course covers the basics of fuzzy systems, neural networks and neuro-fuzzy systems. The main focus is the concepts and algorithms of fuzzy sets, rules, and reasoning, as well as neural network structures, supervised learning and unsupervised learning of neural networks, and hybrid neuro-fuzzy systems. The applications of neural networks and fuzzy systems to control systems, signal processing, systems modeling and systems identification will be presented through examples.

*Prerequisite(s):* ENGG\*3410

*Department(s):* School of Engineering

**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.

*Prerequisite(s):* ENGG\*2230, ENGG\*3370

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**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\*2160, MATH\*2130, MATH\*2270

*Department(s):* School of Engineering

**ENGG\*4480 Advanced Mechatronic Systems Design W (3-3) [0.75]**

The course is a follow up to the introductory mechatronics course and aims at covering advanced topics that are necessary in developing mechatronic systems. Topics include: signal conditioning and filtering for mechatronics system including advanced filters such as Kalman filters; important/advanced electronic circuits for mechatronics systems; microcontroller interfacing and programming; design and development of motion control for mechatronics systems including PLC; introduction of integrated complex mechatronics systems: concept, structure, and applications. Through a design project, students will use and apply these concepts in building a complex mechatronics system with advanced features.

*Prerequisite(s):* ENGG\*3490

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**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.

*Prerequisite(s):* ENGG\*3380

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**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\*3380 or ENGG\*3640

*Department(s):* School of Engineering

**ENGG\*4580 Sustainable Energy Systems Design W (3-3) [0.75]**

The analysis and design of sustainable energy systems are presented in this course. Techniques considered include generation of alternative designs to satisfy a problem definition; evaluation of alternative designs; application of modeling simulations and cost analyses.

*Prerequisite(s):* ENGG\*3080, ENGG\*3370, ENGG\*3430

*Department(s):* School of Engineering

**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

*Department(s):* School of Engineering

**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.

*Prerequisite(s):* ENGG\*3100

*Department(s):* School of Engineering

**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.

*Prerequisite(s): CIS\*2500, CIS\*3490, ENGG\*3700*

*Department(s): School of Engineering*

**ENGG\*4760 Biological Wastewater Treatment Design W (3-2) [0.50]**

The course applies design principles for a variety of biological treatment systems for both municipal and industrial wastewater. This involves the design of suspended growth and attached growth processes, anaerobic digestion, sludge processing and utilization, water reuse and resource recovery facilities.

*Prerequisite(s): ENGG\*3590*

*Restriction(s): ENGG\*4260*

*Department(s): School of Engineering*

**ENGG\*4770 Physical & Chemical Water and Wastewater Treatment Design F (3-2) [0.50]**

This course focuses on the theory, application, and design principles of physical and chemical operations and processes for the treatment of water and wastewater. This involves the design of physical and chemical 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 health and safety for workers and the public.

*Prerequisite(s): ENGG\*3590*

*Restriction(s): ENGG\*4260*

*Department(s): School of Engineering*

**ENGG\*4810 Control of Atmospheric Particulates F (3-2) [0.50]**

The focus of this course is understanding, analyzing and designing conventional and innovative atmospheric particulate control systems. The properties and transport of atmospheric particulates, and the principles of cyclones, filtration and electrostatic precipitation will be taught through theory, simulations, experiments and a design project.

*Prerequisite(s): 6.00 credits of ENGG courses, ENGG\*2230, ENGG\*2450,  
MATH\*2130*

*Restriction(s): ENGG\*4330*

*Department(s): School of Engineering*

**ENGG\*4820 Atmospheric Emission Control: Combustion Systems W (3-2) [0.50]**

Combustion systems are an essential part of our society, however, they are also the dominant source of atmospheric pollutants. This course will focus on investigation of combustion systems for the purpose of reducing atmospheric emissions.

*Prerequisite(s): ENGG\*2560, ENGG\*3260*

*Co-requisite(s): ENGG\*3430*

*Restriction(s): ENGG\*4330*

*Department(s): School of Engineering*

## 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 one 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\*1030 Effective Writing S,F,W (3-0) [0.50]

This course is designed primarily for those not pursuing a specialization in English and focuses on the development of the skills for effective writing. Topics will include sentence and paragraph structure, essay organization, and the implementation of convincing written arguments. Students will apply these skills to the completion of several written assignments, culminating in a short work of non-fiction prose.

*Offering(s):* Also offered through Distance Education format.

*Restriction(s):* Not available to students registered in ENGL majors or minors

*Department(s):* School of English and Theatre Studies

### 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.

*Restriction(s):* This is a priority access course. Enrolment in the fall semester may be restricted to students registered in the English major, minor, area of concentration, Creative Writing minor, or in semesters one or two of the BA or BAS program.

*Department(s):* School of English and Theatre Studies

### 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.

*Offering(s):* Also offered through Distance Education format.

*Department(s):* School of English and Theatre Studies

### 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.

*Department(s):* School of English and Theatre Studies

### ENGL\*1500 Medicine and Literature W (3-0) [0.50]

This course explores the representational and cultural practices concerning health care and the body. Students will examine how literary texts represent, interpret, and critique the cultures of biomedical science, the clinic, and the hospital. Areas of interest include disease, illness, health, disability, and psychological and physiological trauma.

*Department(s):* School of English and Theatre Studies

### 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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 2.00 credits

*Department(s):* School of English and Theatre Studies

### 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

*Department(s):* School of English and Theatre Studies

### ENGL\*2090 Studies in Shakespeare W (3-0) [0.50]

This course focuses on Shakespeare as both a writer and an enduring cultural presence. It may, at the instructor's choice, focus on works by Shakespeare as well as works by others in response to Shakespeare, in Shakespeare's original historical context or in more contemporary contexts. The course may address, among others, genre, performance, adaptation, the politics of Shakespearean interpretation, including issues such as gender, subjectivity, empire, and nation. Reading-intensive course.

*Prerequisite(s):* 2.00 credits

*Restriction(s):* ENGL\*3020 , ENGL\*3120

*Department(s):* School of English and Theatre Studies

### 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

*Restriction(s):* Registration in the English major, minor or area of concentration.

*Department(s):* School of English and Theatre Studies

### 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

*Restriction(s):* Registration in the English major, minor or area of concentration.

*Department(s):* School of English and Theatre Studies

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 2.00 credits

*Department(s):* School of English and Theatre Studies

**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):* 2.00 credits

*Department(s):* School of English and Theatre Studies

**ENGL\*2260 Law and Literature F (3-0) [0.50]**

This course introduces students to the intersections between law and literature. The course encourages students to read literary texts by focusing on issues of justice, crime, judgment, and equity. Students will examine how literature can serve as an alternative cultural arena or site that gives voice to experiences and knowledges that cannot be translated into the law's language of equivalence and neutrality. By reading literary texts in relation to the law, students will examine how literature and literary theory can enhance our understanding of the law.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 2.00 credits

*Department(s):* School of English and Theatre Studies

**ENGL\*2270 Fairy, Trickster, and Mythical Hero F (3-0) [0.50]**

This course focuses on the everyday emergence of the fantastic, the otherworldly, and the extraordinary in commonly told cultural narratives such as the fairy tale, trickster tale and myth. The course may focus on tales of specific regions (e.g. Europe, North America, the South Pacific), and may cross a range of genres (oral tale, pantomime, short story, film, graphic novel) as well as historical periods. The course may also address continuities and discontinuities in versions of traditional narratives created by tellers, writers, and other artists.

*Offering(s):* First offering - Fall 2019 Offered in odd-numbered years.

*Prerequisite(s):* 2.00 credits

*Department(s):* School of English and Theatre Studies

**ENGL\*2280 Sporting Bodies W (3-0) [0.50]**

This course examines various aspects of sports and play as they are manifested in a range of literary texts and other cultural forms. Because the emergence of sport as a social practice has been so intertwined with notions of regulation, performance, and fandom, sporting culture offers a valuable site for looking at questions of identity and social relations more broadly.

*Offering(s):* First offering - Winter 2020 Offered in even-numbered years.

*Prerequisite(s):* 2.00 credits

*Department(s):* School of English and Theatre Studies

**ENGL\*2290 Outlaws W (3-0) [0.50]**

Literary narratives about crime and the criminal have both glamorized the outlaw and idealized the restoration of law and order. Students will examine how literary narratives frame the figure of the outlaw in order to: contemplate the relationship between the individual and law, as well as between outlaw communities and the law; shape popular understandings of the law and the consequences of breaking the law; interrogate the law's absolute claim to justice; examine the cost of policing to maintain law and order; and/or critique state power by giving voice to the marginalized.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 2.00 credits

*Department(s):* School of English and Theatre Studies

**ENGL\*2310 Vampires, Ghosts, and Mummies: Literature and the Supernatural F (3-0) [0.50]**

While we often dismiss the occult or the supernatural in literature as simple entertainment, this course encourages students to examine how literary works engage the occult and the supernatural in order to address issues of power, race, gender, imperialism and modernity from the nineteenth century to the present.

*Offering(s):* First offering - Fall 2019 Offered in odd-numbered years.

*Prerequisite(s):* 2.00 credits

*Department(s):* School of English and Theatre Studies

**ENGL\*2330 Print Culture and Cinema F (3-0) [0.50]**

This course moves between writing and cinema, in different periods and with different emphases according to the instructor's expertise. Topics may include: adaptation from page to screen and adaptation theory; the relationship between print forms and early motion picture and between fiction and film; the construction of celebrity and spectatorship in print and movie cultures; questions of "fidelity," technology, silence and sound, literary prestige and film publicity. Reading-intensive course.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 2.00 credits

*Department(s):* School of English and Theatre Studies

**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):* 2.00 credits

*Department(s):* School of English and Theatre Studies

**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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 2.00 credits

*Department(s):* School of English and Theatre Studies

**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, 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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 2.00 credits

*Department(s):* School of English and Theatre Studies

**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):* 2.00 credits

*Department(s):* School of English and Theatre Studies

**ENGL\*2920 Elements of Creative Writing F,W (3-0) [0.50]**

This lecture course focuses on teaching character, dialogue, setting and plot. Students will learn how to create a compelling narrative, as well as recognize the key successful elements in the narratives that surround us, for example advertisements, blogs, or film, television, etc. Student skills are developed through a combination of lectures, in-class workshops, peer editing, and short written assignments.

*Prerequisite(s):* 4.00 credits

*Department(s):* School of English and Theatre Studies

**ENGL\*3050 Intermediate Fiction Writing Workshop F,W (3-0) [0.50]**

Students will gain a deeper understanding of the basic elements of creative writing (character development, effective dialogue, narrative arc, and setting) through practical experiments, discussions, and group writing exercises. Through the writing workshops, students will hone their skills as creative writers, critical thinkers, and editors.

*Prerequisite(s):* ENGL\*1080, ENGL\*2920

*Restriction(s):* Registration in the Creative Writing minor.

*Department(s):* School of English and Theatre Studies

**ENGL\*3060 Intermediate Poetry Writing Workshop F (3-0) [0.50]**

Students will gain a deeper understanding of the basic elements of poetry writing (form, line, metre, imagery, rhyme, rhythm, syntax, and metaphor). Alongside this attention to form, students will explore the histories of these global poetries and their relationship to historical developments. Through reading assigned texts and the writing workshops students will hone their skills as creative writers, critical thinkers, and editors.

*Prerequisite(s):* ENGL\*1080, ENGL\*2920

*Restriction(s):* ENGL\*2940 , Registration in the Creative Writing minor.

*Department(s):* School of English and Theatre Studies

**ENGL\*3070 Intermediate Screenwriting Workshop W (3-0) [0.50]**

With emphasis on craft, this workshop addresses some fundamentals of feature screenwriting through various writing, reading and viewing assignments and exercises, as well as the workshopping of students' written work. Topics will include: story structure, theme, character development, story lines, scene construction, synopsis writing and pitching, and options for further training and development.

*Prerequisite(s):* ENGL\*1080, ENGL\*2920

*Restriction(s):* Registration in the Creative Writing minor.

*Department(s):* School of English and Theatre Studies

**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.

*Department(s):* School of English and Theatre Studies

**ENGL\*3090 Special Topics in Creative Writing Workshop F,W (3-0) [0.50]**

This course will provide students with opportunities to write in genres other than fiction, poetry, playwriting and screenwriting. Each iteration will focus on a particular genre, which might include graphic novels, writing narrative of games, memoir or travel writing. Please consult the School of English and Theatre Studies's website for more information on a specific iteration of the course.

*Prerequisite(s):* ENGL\*1080, ENGL\*2920

*Restriction(s):* Registration in the Creative Writing minor.

*Department(s):* School of English and Theatre Studies

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 7.50 credits including 0.50 credits in English (excluding ENGL\*1030)

*Department(s):* School of English and Theatre Studies

**ENGL\*3240 Studies in Early Modern Literature and Culture W (3-0) [0.50]**

This course examines various aspects of the literature and culture of early modern England. The course may examine, at the instructor's choice, some part of the fifteenth, sixteenth and seventeenth centuries and may focus on a variety of issues, including gender and sexuality, poetics and politics, religion and authority, nation and empire, and their relation to literary production. The genres and writers examined will vary.

*Prerequisite(s):* 7.50 credits including 0.50 credits in English (excluding ENGL\*1030)

*Restriction(s):* ENGL\*3170, ENGL\*3190 .

*Department(s):* School of English and Theatre Studies

**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.

*Prerequisite(s):* 1.00 credits in English.

*Department(s):* School of English and Theatre Studies

**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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 7.50 credits including 0.50 credits in English (excluding ENGL\*1030)

*Department(s):* School of English and Theatre Studies

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 7.50 credits including 0.50 credits in English (excluding ENGL\*1030)

*Department(s):* School of English and Theatre Studies

**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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 7.50 credits including 0.50 credits in English (excluding ENGL\*1030)

*Department(s):* School of English and Theatre Studies

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 7.50 credits including 0.50 credits in English (excluding ENGL\*1030)

*Department(s):* School of English and Theatre Studies

**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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 7.50 credits including [0.50 credits in English (excluding ENGL\*1030) or 0.50 credits in Theatre Studies]

*Department(s):* School of English and Theatre Studies

**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.

*Department(s):* School of English and Theatre Studies

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 7.50 credits including 0.50 credits in English (excluding ENGL\*1030)

*Department(s):* School of English and Theatre Studies

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 7.50 credits including 0.50 credits in English (excluding ENGL\*1030)

*Department(s):* School of English and Theatre Studies

**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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 7.50 credits including 0.50 credits in English (excluding ENGL\*1030)

*Department(s):* School of English and Theatre Studies

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 1.00 credits in English.

*Department(s):* School of English and Theatre Studies

**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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 7.50 credits including 0.50 credits in English (excluding ENGL\*1030)

*Department(s):* School of English and Theatre Studies

**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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 7.50 credits including 0.50 credits in English (excluding ENGL\*1030)

*Department(s):* School of English and Theatre Studies

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 7.50 credits including 0.50 credits in English (excluding ENGL\*1030)

*Department(s):* School of English and Theatre Studies

**ENGL\*3680 20th- & 21st-Century Canadian Literature and Criticism F (3-0) [0.50]**

This course examines Canadian literature and criticism in English from the beginnings of the twentieth century to the present in relation to a variety of social, cultural, and historical contexts. Reading-intensive course.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 7.50 credits including 0.50 credits in English (excluding ENGL\*1030)

*Department(s):* School of English and Theatre Studies

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 7.50 credits including 0.50 credits in English (excluding ENGL\*1030)

*Department(s):* School of English and Theatre Studies

**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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 7.50 credits including 0.50 credits in English (excluding ENGL\*1030)

*Department(s):* School of English and Theatre Studies

**ENGL\*3760 The Atlantic World W (3-0) [0.50]**

This is 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 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, representations of oceanic space, the erasure and fluidity at work in the metaphors of the sea, the evolution of national and racial stereotypes, and religious syncretism. Reading-intensive course.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 7.50 credits including 0.50 credits in English (excluding ENGL\*1030)

*Department(s):* School of English and Theatre Studies

**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.

*Department(s):* School of English and Theatre Studies

**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.

*Department(s):* School of English and Theatre Studies

**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

*Restriction(s):* Registration in the English major, minor or area of concentration.

*Department(s):* School of English and Theatre Studies

**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

*Restriction(s):* Registration in the English major, minor or area of concentration.

*Department(s):* School of English and Theatre Studies

**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. Restricted to students with fewer than 2.00 credits of 4000-level English courses.

*Department(s):* School of English and Theatre Studies

**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. Restricted to students with fewer than 2.00 credits of 4000-level English courses.

*Department(s):* School of English and Theatre Studies

**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. Restricted to students with fewer than 2.00 credits of 4000-level English courses.

*Department(s):* School of English and Theatre Studies

**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. Restricted to students with fewer than 2.00 credits of 4000-level English courses.

*Department(s):* School of English and Theatre Studies

**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. Restricted to students with fewer than 2.00 credits of 4000-level English courses.

*Department(s):* School of English and Theatre Studies

**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. Restricted to students with fewer than 2.00 credits of 4000-level English courses.

*Department(s):* School of English and Theatre Studies

**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. Restricted to students with fewer than 2.00 credits of 4000-level English courses.

*Department(s):* School of English and Theatre Studies

**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):* ENGL\*4220 Restricted to students in the English majors, who have completed 14.00 credits with an average of 70% in all course attempts in English. Restricted to students with fewer than 2.00 credits of 4000-level English courses.

*Department(s):* School of English and Theatre Studies

**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. Restricted to students with fewer than 2.00 credits of 4000-level English courses.

*Department(s):* School of English and Theatre Studies

**ENGL\*4720 Creative Writing: Prose/Poetry F,W (3-0) [1.00]**

A development and extension of the creative writing/reading skills and techniques introduced in the creative writing workshops. 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.

*Prerequisite(s):* 1 of ENGL\*2920, ENGL\*2940 , ENGL\*3050, ENGL\*3060, ENGL\*3070, ENGL\*3090

*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 departmental website for more information.

*Department(s):* School of English and Theatre Studies

**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.

*Department(s):* School of English and Theatre Studies

**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. Restricted to students with fewer than 2.00 credits of 4000-level English courses.

*Department(s):* School of English and Theatre Studies

**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. Restricted to students with fewer than 2.00 credits of 4000-level English courses.

*Department(s):* School of English and Theatre Studies

**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.

*Department(s):* School of English and Theatre Studies

## Environmental Management

School of Environmental Sciences

### **ENVM\*3500 Environmental Management Integrated Project W (5-0) [1.00]**

Students will apply the skills and knowledge gained in earlier courses to analyzing environmental processes and issues associated with an industrial, municipal, or agricultural enterprise. Students will work in teams to complete a detailed environmental report with policy recommendations and action plans.

*Prerequisite(s):* 5.00 credits

*Restriction(s):* ENVM\*2500 Registered in BBRM:EM

*Department(s):* School of Environmental Sciences

## 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\*1030 Introduction to Environmental Sciences F (6-0) [1.00]

This course introduces students to what it means to think critically from an environmental sciences perspective. It covers an introduction to: philosophy of science, philosophy of the environment, the evaluation of scientific evidence, and scientific arguments. The course focuses on how we understand and recognize environmental problems, how we decide what to do about them, and what role science can and should play in these discussions.

*Restriction(s): ENVS\*1100 Registration in the BSC(Env) program or BBRM.EM*

*Department(s): School of Environmental Sciences*

#### ENVS\*1060 Principles of Geology S,F,W (3-0) [0.50]

This course provides an introduction to geological principles, their historical development and application to interpreting Earth materials and processes. This course is suitable for those wishing a general knowledge of Earth sciences.

*Offering(s): Offered through Distance Education format only.*

*Equate(s): GEOL\*1100*

*Restriction(s): May not be taken for credit by students in BBRM, BSC or BSC(Env).*

*Department(s): School of Environmental Sciences*

#### ENVS\*1100 Fundamentals of Environmental Sciences F (3-0) [0.50]

This course introduces students to what it means to think critically from an environmental sciences perspective. It covers an introduction to: philosophy of science, philosophy of the environment, the evaluation of scientific evidence, and scientific arguments. The course focuses on how we understand and recognize environmental problems, how we decide what to do about them, and what role science can and should play in these discussions.

*Restriction(s): ENVS\*1030 Not available to students registered in BSC(Env) program and BBRM.EM*

*Department(s): School of Environmental Sciences*

#### ENVS\*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 ENVM\*1120 , IPS\*1500, MATH\*1080, MATH\*1200, PHYS\*1080, PHYS\*1130*

*Equate(s): MET\*2030*

*Department(s): School of Environmental Sciences*

#### ENVS\*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\*1050, BIOL\*1070, BIOL\*1080, BIOL\*1090)*

*Equate(s): ENVB\*2040*

*Department(s): School of Environmental Sciences*

#### ENVS\*2060 Soil Science S,F (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.

*Offering(s): Also offered through Distance Education format.*

*Equate(s): SOIL\*2010*

*Restriction(s): AGR\*2320.*

*Department(s): School of Environmental Sciences*

#### ENVS\*2070 Environmental Perspectives and Human Choices F (3-0) [0.50]

This is 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.

*Offering(s): Offered through Distance Education format only.*

*Equate(s): UNIV\*2050*

*Department(s): School of Environmental Sciences*

#### ENVS\*2080 Introduction to Environmental Microbiology W (2-3) [0.50]

This course will introduce students to environmental microbiology, with a focus on the important roles of microorganisms in various environments such as soil, water and sediments. Discussion will emphasize the physiology, biochemistry, molecular biology and ecology of microorganisms, and how a good understanding of these microbial processes can enable beneficial applications of microorganisms in biotechnology and bioremediation.

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

*Restriction(s): ENVM\*1020 , ENVS\*2320*

*Department(s): School of Environmental Sciences*

#### ENVS\*2120 Introduction to Environmental Stewardship F (3-0) [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.

*Offering(s): Offered through Distance Education format only.*

*Department(s): School of Environmental Sciences*

#### ENVS\*2130 Eating Sustainably in Ontario F,W (3-0) [0.50]

This course is intended to introduce students to the science behind food related issues within the context of Ontario agriculture and food systems. The course will provide students with an overview of the history of agriculture in Ontario and an opportunity to discuss both sides of current debates over food production and associated environmental and human health issues.

*Offering(s): Also offered through Distance Education format.*

*Prerequisite(s): 4.00 credits*

*Restriction(s): May not be taken by students in the BAS, BBRM, BSC, BSC(Agr) or BSC(Env) programs*

*Department(s): School of Environmental Sciences*

#### ENVS\*2210 Apiculture and Honey Bee Biology 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.

*Offering(s): Also offered through Distance Education format.*

*Equate(s): ENVB\*2210*

*Department(s): School of Environmental Sciences*

#### ENVS\*2230 Communications in Environmental Science F,W (4-0) [0.50]

This course provides students with direct training in the academic skills used in researching and communicating environmental science. Within the context of current problems in environmental science, students will develop skills in library research, statistical interpretation, oral and poster presentation and written communication to diverse audiences. Students will research and report on scientific issues within environmental issues being reported in the media.

*Prerequisite(s): 1 of ENV\*1000 , ENVM\*1200 , ENVS\*1030*

*Restriction(s): Registration in BBRM, BSC(Env) or BSC(Agr) programs.*

*Department(s): School of Environmental Sciences*

#### ENVS\*2240 Fundamentals of Environmental Geology F (2-3) [0.50]

This course introduces the concepts and real-world examples of environmental issues related to plate tectonics, natural resources and igneous, metamorphic and sedimentary processes and rocks, groundwater and structural geology. Students will develop laboratory skills in rock and mineral identification, geological map interpretation and site characterization.

*Prerequisite(s): GEOG\*1300*

*Restriction(s): ENVS\*1050*

*Department(s): School of Environmental Sciences*

**ENVS\*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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 1 of ENVS\*1050 , ENVS\*1060, GEOL\*1050 , GEOL\*1100 , GEOG\*1300, GEOG\*1350

*Equate(s):* GEOL\*2250

*Department(s):* School of Environmental Sciences

**ENVS\*2270 Impacts of Climate Change F,W (3-0) [0.50]**

This course will provide students with an overview of recent research into what climate change means for Canada and Canadians. Students will learn about evidence for significant changes to the Boreal forests and about the potential impacts of climate change on human health through increasing heat waves and the heat stress on individuals. The course is intended to bridge the gap between abstract discussion of the climate and understand what these changes mean at both personal and societal levels.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* Minimum of 4.00 credits

*Restriction(s):* May not be taken by students in the BAS, BBRM, BSC, BSC(Agr) or BSC(Env) programs

*Department(s):* School of Environmental Sciences

**ENVS\*2310 Earth Surface Processes F (4-0) [0.50]**

This course introduces aspects of Earth science that are critical to understanding environmental issues with societal impacts. Students will gain a basic understanding of biogeochemical cycling by exploring how biological processes control element fluxes between water, air, and earth materials. Topics of current interest, such as resource extraction, climate change and geoengineering will be discussed in terms of their contributions to major element cycles. Seminars include quantitation exercises, hands-on exercises, and discussions to complement topics covered in the lectures

*Prerequisite(s):* CHEM\*1040, ENVS\*1030

*Department(s):* School of Environmental Sciences

**ENVS\*2330 Current Issues in Ecosystem Science and Biodiversity F (4-0) [0.50]**

This course provides an introduction to a range of specific environmental and scientific issues relating to ecological sciences. Issues to be covered include the biology of climate change, forest science and management of terrestrial ecosystems. Three examples of current problems of societal concern will be used as starting points to examine the role of science in addressing them, while developing students' knowledge of the underlying science and its relation to policy and economics.

*Prerequisite(s):* 1 of BIOL\*1050, BIOL\*1070, ENV\*1000 , ENV\*1200 , ENVS\*1030

*Equate(s):* ENVB\*2030

*Restriction(s):* ENVB\*3330 , ENVS\*2150

*Department(s):* School of Environmental Sciences

**ENVS\*2340 Current Issues in Agriculture and Landscape Management W (4-0) [0.50]**

This course provides an introduction to a range of specific environmental and scientific issues relating to agriculture and landscape management. Issues to be covered include land remediation, environmental impacts of food production and surface water quality. Three examples of current problems of societal concern will be used as starting points to examine the role of science in addressing them, while developing students' knowledge of the underlying science and its relation to policy and economics.

*Prerequisite(s):* AGR\*2050 or [(BIOL\*1050 or BIOL\*1070), (1 of ENV\*1000 , ENV\*1200 , ENVS\*1030, ENVS\*2330)]

*Restriction(s):* NRS\*3000 Registration in BBRM, BSC(Env) or BSC(Agr) programs.

*Department(s):* School of Environmental Sciences

**ENVS\*3000 Nature Interpretation F,W (2-3) [0.50]**

This course explores communication and experiential learning theories and their application to natural history interpretation and environmental education program design and delivery. Students will develop interpretive materials, plan an interpretive walk and deliver the interpretive walk to a community group.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* BIOL\*2060

*Equate(s):* ENVB\*3000

*Department(s):* School of Environmental Sciences

**ENVS\*3010 Climate Change Biology S,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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* BIOL\*2060

*Equate(s):* ENVB\*3010

*Department(s):* School of Environmental Sciences

**ENVS\*3020 Pesticides and the Environment F,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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* [ BIOL\*1040 or (2 of BIOL\*1050, BIOL\*1070, BIOL\*1080, BIOL\*1090)], CHEM\*1040

*Equate(s):* ENVB\*3030

*Department(s):* School of Environmental Sciences

**ENVS\*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

*Equate(s):* NRS\*3030

*Restriction(s):* Instructor consent required.

*Department(s):* School of Environmental Sciences

**ENVS\*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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* BIOL\*1040 or (2 of BIOL\*1050, BIOL\*1070, BIOL\*1080, BIOL\*1090)

*Equate(s):* ENVB\*3040

*Department(s):* School of Environmental Sciences

**ENVS\*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):* (1 of PHYS\*1000 , PHYS\*1070, PHYS\*1080, PHYS\*1130), (1of ENV\*2020 , ENV\*2030, MET\*2020 , MET\*2030 , GEOG\*2110)

*Equate(s):* MET\*3050

*Department(s):* School of Environmental Sciences

**ENVS\*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):* AGR\*2320 or ENVS\*2060

*Department(s):* School of Environmental Sciences

**ENVS\*3080 Soil and Water Conservation F (3-0) [0.50]**

This course examines 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, and reclamation of severely disturbed soils and saline-sodic soils. Emphasis will be on concepts and solutions to problems in a systems approach.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 1 of AGR\*2320, ENVS\*2060, SOIL\*2010

*Equate(s):* SOIL\*3080

*Department(s):* School of Environmental Sciences

**ENVS\*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\*1050, BIOL\*1070, BIOL\*1080, BIOL\*1090)*

*Equate(s): ENVB\*3090*

*Department(s): School of Environmental Sciences*

**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.

*Prerequisite(s): 12.00 credits including (1 of ENVM\*1000, ENVM\*1200, ENVS\*1020, ENVS\*1030)*

*Restriction(s): Director consent required.*

*Department(s): School of Environmental Sciences*

**ENVS\*3140 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*

*Equate(s): ENVB\*3160*

*Restriction(s): DTM\*3200*

*Department(s): School of Environmental Sciences*

**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): 10.00 credits including ( BIOL\*1030 , BIOL\*1040 ) or (BIOL\*1070, BIOL\*1090), CHEM\*1040*

*Restriction(s): BIOL\*3450*

*Department(s): School of Environmental Sciences*

**ENVS\*3180 Sedimentary Environments F (3-3) [0.50]**

This course examines the principles of sedimentology and stratigraphy as applied to various ancient and modern sedimentary systems. Students will learn to describe and interpret sedimentary deposits in terrestrial and marine systems as well as the larger forces that control the preservation and evolution of these sedimentary systems over geological time. The course includes several field trips.

*Prerequisite(s): ENVS\*1050 or ENVS\*2240*

*Restriction(s): ENVS\*2400*

*Department(s): School of Environmental Sciences*

**ENVS\*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): 1 of BIOL\*1040 , BIOL\*1050, BIOL\*1070*

*Equate(s): ENVB\*3210*

*Department(s): School of Environmental Sciences*

**ENVS\*3220 Terrestrial Chemistry F (4-0) [0.50]**

This course surveys the behaviour of elements in the Earth's surface environments, encompassing soils and saturated (wetland, lake, river) sediments. The course is focused on understanding the factors that control the chemical processes governing soils and freshwater sediments through the reactions of the elements and molecules that they contain. Students will extend their fundamental understanding of chemistry to the materials of the Earth's upper crust.

*Prerequisite(s): CHEM\*1050, ( 1 of ENVS\*1050 , ENVS\*2060, ENVS\*2240)*

*Department(s): School of Environmental Sciences*

**ENVS\*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): 5.00 credits, (1 of BIOL\*1040 , BIOL\*1050, BIOL\*1070)*

*Equate(s): ENVB\*3230*

*Department(s): School of Environmental Sciences*

**ENVS\*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): 1 of BOT\*2100, ENVB\*2030 , ENVS\*2040, ENVS\*2330*

*Equate(s): ENVB\*3250*

*Department(s): School of Environmental Sciences*

**ENVS\*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): 1 of BIOL\*2060, BOT\*3050, ENVS\*2330*

*Equate(s): ENVB\*3270*

*Department(s): School of Environmental Sciences*

**ENVS\*3290 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): ENVS\*2320 or [MBG\*2040, (BIOL\*2060 or MICR\*2420)]*

*Equate(s): ENVB\*3280*

*Department(s): School of Environmental Sciences*

**ENVS\*3310 Soil Biodiversity and Ecosystem Function W (4-0) [0.50]**

Soils are the site of complex interactions between minerals, water, air, organic matter and living organisms. This course will focus on the organisms that live in the soil and their activities in soil ecosystems, soil as a habitat for organisms, the key role of microorganisms in nutrient cycles and plant-microbe relationships and will review basic soil microbial and ecological principles.

*Prerequisite(s): 10.00 credits including (1 of AGR\*2320, ENVS\*2060, SOIL\*2010 )*

*Equate(s): ENVS\*3200 , SOIL\*3200*

*Department(s): School of Environmental Sciences*

**ENVS\*3340 Use and Management of Environmental Data F (2-3) [0.50]**

This course is focused on finding, collecting and interpreting data of the physical environment. Students will access various online databases, such as meteorological and hydrological time series, and perform and interpret statistical analysis with the data. Issues around calibration and data collection will be explored by performing calibrations and experiments. Students will make a numerical simulation of a dynamic environmental phenomenon. Students will learn to build and query a relational database with both qualitative and quantitative data.

*Prerequisite(s): 1 of GEOG\*2460, STAT\*2040, STAT\*2060*

*Restriction(s): ENVS\*4110*

*Department(s): School of Environmental Sciences*

**ENVS\*3370 Terrestrial Ecosystem Ecology W (3-0) [0.50]**

In this course, the ecosystem is the biological level of organization of interest. Living organisms and their physical environment are considered as components of an integrated system. Key ecosystem processes such as energy flow, carbon and nutrient cycling, and succession, and the controls on these processes, are examined. The impacts of human activity and global change on ecosystem structure and function are investigated.

*Prerequisite(s): BIOL\*2060 or ENVS\*2330*

*Department(s): School of Environmental Sciences*

**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):* Minimum of 10.00 credits. Minimum cumulative average of 70%.

*Restriction(s):* ENVS\*3430 Instructor consent required. Restricted to students in BBRM.EM, BSC(Env), BSC(Agr) or BSCH.

*Department(s):* School of Environmental Sciences

**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. Minimum of 10.00 credits. Minimum cumulative average of 70%.

*Restriction(s):* ENVS\*3430 Instructor consent required. Registration in BBRM.EM, BSC(Env), BSC(Agr) or BSCH.

*Department(s):* School of Environmental Sciences

**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):* Minimum of 10.00 credits. Minimum cumulative average of 70%.

*Restriction(s):* ENVS\*3410, ENVS\*3420 Instructor consent required. Registration in BBRM.EM, BSC(Env), BSC(Agr) or BSCH.

*Department(s):* School of Environmental Sciences

**ENVS\*3510 Independent Study I S,F,W (0-6) [0.50]**

This course introduces students to independent research and study. Students will undertake a project based on research in the literature that relates to environmental sciences. 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\*3520. 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):* Minimum of 10.00 credits. Minimum cumulative average of 70%.

*Restriction(s):* ENVS\*3530 Instructor consent required. Restricted to students in BBRM.EM, BSCH, BSC(Agr) or BSC(Env).

*Department(s):* School of Environmental Sciences

**ENVS\*3520 Independent Study II S,F,W (0-6) [0.50]**

This course introduces students to independent research and study. Students will undertake a project based on research in the literature that relates to environmental sciences. Projects may be a continuation of research conducted in ENVS\*3510, 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\*3510. Minimum cumulative average of 70%.

*Restriction(s):* ENVS\*3530 Instructor consent required. Restricted to students in BBRM.EM, BSCH, BSC(Agr) or BSC(Env).

*Department(s):* School of Environmental Sciences

**ENVS\*3530 Independent Study S,F,W (0-12) [1.00]**

This course introduces students to independent research and study. Students will undertake a project based on research in the literature that relates to environmental sciences. 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):* Minimum of 10.00 credits. Minimum cumulative average of 70%.

*Restriction(s):* ENVS\*3510, ENVS\*3520 Instructor consent required. Restricted to students in BBRM.EM, BSCH, BSC(Agr) or BSC(Env).

*Department(s):* School of Environmental Sciences

**ENVS\*4001 Project in Environmental Sciences F (3-0) [0.50]**

First part of the two-semester course ENVS\*4001/2. Refer to ENVS\*4001/2 for course description.

*Equate(s):* ENVS\*4011

*Restriction(s):* 12.00 credits, Registration in the BSC(Env) program.

*Department(s):* School of Environmental Sciences

**ENVS\*4001/2 Project in Environmental Sciences F-W (3-0) [1.00]**

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. This is a two-semester course offered over consecutive semesters. When you select it you must select ENVS\*4001 in the Fall semester and ENVS\*4002 in the Winter semester. A grade will not be assigned to ENVS\*4001 until ENVS\*4002 is completed.

*Equate(s):* ENVS\*4011/2

*Restriction(s):* 12.00 credits, Registration in the BSC(Env) program.

*Department(s):* School of Environmental Sciences

**ENVS\*4002 Project in Environmental Sciences W (3-0) [0.50]**

This is the second part of the two-semester course ENVS\*4001/2. Refer to ENVS\*4001/2 for course description.

*Prerequisite(s):* ENVS\*4001

*Equate(s):* ENVS\*4012

*Department(s):* School of Environmental Sciences

**ENVS\*4070 Pollinator Conservation W (3-0) [0.50]**

This course will explore the ecology of pollination with an emphasis on the roles animals play in pollen movement. Students will critically examine hypothesized drivers of regional, national and global pollinator declines, and the range of potential strategies suggested to mitigate or reverse these declines. Students will examine the efficacy of a wide range of pollinator conservation strategies in different geographical, ecological and economic contexts to help them build an understanding of the available toolbox for conservation.

*Prerequisite(s):* BIOL\*3130

*Department(s):* School of Environmental Sciences

**ENVS\*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, ENVS\*2060, SOIL\*2010

*Equate(s):* SOIL\*4090

*Department(s):* School of Environmental Sciences

**ENVS\*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.

*Prerequisite(s):* 1 of CROP\*3300, CROP\*3310, ENVB\*2040 , ENVB\*3090 , ENVS\*2040, ENVS\*3090, HORT\*3280, HORT\*3350 , HORT\*3510

*Equate(s):* ENVB\*4100

*Department(s):* School of Environmental Sciences

**ENVS\*4160 Soil and Nutrient Management F (4-3) [0.50]**

This course consists of the same lectures and seminars as (ENVS\*4090 or 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 NMN software program.

*Prerequisite(s):* 1 of AGR\*2301/2 , AGR\*2320, ENVS\*2060, SOIL\*2010

*Equate(s):* SOIL\*4130

*Restriction(s):* ENV\*1070 . (ENVS\*4090 or SOIL\*4090 ).

*Department(s):* School of Environmental Sciences

**ENVS\*4180 Insecticide Biological Activity and Resistance W (4-0) [0.50]**

This course explores the diverse modes of action of botanical, microbial and synthetic insecticides. Detoxification mechanisms, selectivity, resistance management and the process of pesticide discovery and development are also considered. The course includes a review of insect physiological systems and discussion of the stability and distribution of pesticides in the environment.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* Minimum of 12.00 credits

*Restriction(s):* ENVB\*4240 . Registration in the BAS, BBRM, BSC, BSC(Agr) or BSC(Env) program

*Department(s):* School of Environmental Sciences

**ENVS\*4190 Biological Activity of Herbicides W (3-0) [0.50]**

This course explores the diverse modes of action of botanical, microbial and synthetic herbicides. Detoxification mechanisms, selectivity, resistance management and the process of herbicide discovery and development are also considered. The course includes a review of plant physiological systems and discussion of the stability and distribution of herbicides in the environment.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* Minimum of 12.00 credits

*Restriction(s):* ENVB\*4240 . Registration in the BAS, BBRM, BSC, BSC(Agr) or BSC(Env) program.

*Department(s):* Department of Plant Agriculture

**ENVS\*4210 Meteorological and Environmental Instrumentation W (3-0) [0.50]**

This course covers the design and implementation of measurement systems 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 propose and perform a small independent experiment or field measurement of their own design.

*Prerequisite(s):* 1 of ENVS\*3050, ENVS\*3130 , ENVS\*3340, PHYS\*3100

*Equate(s):* MET\*4210

*Department(s):* School of Environmental Sciences

**ENVS\*4230 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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* ENVB\*3090 or ENVS\*3090

*Equate(s):* ENVB\*4220

*Department(s):* School of Environmental Sciences

**ENVS\*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 ENVS\*3090 ) or ( ENVB\*4040 or ENVS\*4040 )

*Equate(s):* ENVB\*4260

*Restriction(s):* Instructor consent required.

*Department(s):* School of Environmental Sciences

**ENVS\*4320 Laboratory and Field Methods in Soil Biodiversity W (1-3) [1.00]**

This course will use a hand-on approach to investigate concepts and develop skills needed for understanding key soil functions. Emphasis will be on the transformation of nutrients and contaminants in soils and groundwater by microorganisms. Approaches for analyzing microbial populations and activities in the environment, including molecular techniques will be covered.

*Prerequisite(s):* ENVS\*3200 or ENVS\*3310

*Department(s):* School of Environmental Sciences

**ENVS\*4350 Forest Ecology F (3-3) [0.50]**

This course will explore aspects of forest ecology with an 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):* BIOL\*2060 or ENVS\*2330

*Equate(s):* ENVB\*4780

*Department(s):* School of Environmental Sciences

**ENVS\*4360 Glacial Environments W (4-0) [0.50]**

This course will explore modern to ancient glacial environments, focusing on the sedimentary record they leave behind and applications of glacial geology including reconstructing past environments, examining how glacial deposits affect the distribution of resources or groundwater contaminants, and discovering the response of glaciers to recent and past climate change. Students will develop skills in critically evaluating literature and geological data, description and identification of glacial deposits.

*Prerequisite(s):* ENVS\*2400 or ENVS\*3180

*Department(s):* School of Environmental Sciences

**ENVS\*4370 Environmental Organic Chemistry W (3-0) [0.50]**

This course discusses the chemical processes that influence organic compounds in the environment, including both anthropogenic organic compounds, such as pollutants and pesticides, and natural organic matter, such as humic materials and biomolecules. Topics include: the occurrence of organic contamination in the environment, emerging classes of organic contaminants, the relationship between molecular structure and environmental fate, persistent organic pollutants, the transformation of organic molecules in the environment, and the origins and functionality of natural organic matter in terrestrial and aquatic environments.

*Prerequisite(s):* ENVS\*3220

*Department(s):* School of Environmental Sciences

**ENVS\*4390 Soil Variability and Land Evaluation F (3-2) [1.00]**

This course integrates formal in-field (including a two-day camp & excursions during orientation week) and laboratory training, with classroom discussions of concepts, to guide independent group projects on the gathering and interpreting of soilscape information. The principal focus is on soil, as a spatially- and temporally-variable product and component of ecosystems; special consideration is given to the factors controlling soil processes, from local to global scales. An examination of methods, for describing and quantifying the distribution of soils, includes survey and sensor-based techniques, in conjunction with data trend analysis and modelling. Students are required to notify the instructor in the preceding Winter semester of their intention to participate.

*Prerequisite(s):* 15.00 credits including (1 of AGR\*2320, ENVS\*2060, ENVS\*2310, ENVB\*2340, SOIL\*2010 )

*Restriction(s):* ENVS\*3120 , ENVS\*4150 , ENVS\*4250 , SOIL\*4250 .

*Department(s):* School of Environmental Sciences

**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. Minimum of 15.00 credits. Minimum cumulative average of 70%.

*Restriction(s):* ENVS\*4430. Instructor consent required. Registration in BSC(Env), BSC(Agr), BSCH or BBRM.

*Department(s):* School of Environmental Sciences

**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. Minimum of 15.00 credits. Minimum cumulative average of 70%.

*Restriction(s):* ENVS\*4430. Registration in BSC(Env), BSC(Agr), BSCH or BBRM. Instructor consent required.

*Department(s):* School of Environmental Sciences

**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. Minimum of 15.00 credits. Minimum cumulative average of 70%.

*Restriction(s):* ENVS\*4410, ENVS\*4420. Instructor consent required. Registration in BSC(Env), BSC(Agr), BSCH or BBRM.

*Department(s):* School of Environmental Sciences

**ENVS\*4510 Advanced Independent Study I S,F,W (0-6) [0.50]**

This course provides an opportunity for students to engage in advanced independent research and study. Students will undertake a project based on research in the literature that relates to environmental sciences. 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\*4520. 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):* (1 of ENVS\*3510, ENVS\*3520, ENVS\*3530). Minimum of 14.00 credits. Minimum cumulative average of 70%.

*Restriction(s):* ENVS\*4530. Instructor consent required. Restricted to students in the BBRM.EM, BSCH, BSC(Agr), BSC(Env)

*Department(s):* School of Environmental Sciences

**ENVS\*4520 Advanced Independent Study II S,F,W (0-6) [0.50]**

This course provides an opportunity for students to engage in advanced independent research and study. Students will undertake a project based on research in the literature that relates to environmental sciences. Projects may be a continuation of research conducted in ENVS\*4510, 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\*4510. Minimum of 14.00 credits. Minimum cumulative average of 70%.

*Restriction(s):* ENVS\*4530. Instructor consent required. Restricted to students in the BBRM.EM, BSCH, BSC(Agr), BSC(Env)

*Department(s):* School of Environmental Sciences

**ENVS\*4530 Advanced Independent Study S,F,W (0-12) [1.00]**

This course provides an opportunity for students to engage in advanced independent research and study. Students will undertake a project based on research in the literature that relates to environmental sciences. This project course is designed to provide an intensive study 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):* (1 of ENVS\*3510, ENVS\*3520, ENVS\*3530). Minimum of 14.00 credits. Minimum cumulative average of 70%.

*Restriction(s):* ENVS\*4510, ENVS\*4520. Instructor consent required. Restricted to students in the BBRM.EM, BSCH, BSC(Agr), BSC(Env).

*Department(s):* School of Environmental Sciences

## Equine

*Ontario Agricultural College, Department of Animal Biosciences*

### **EQN\*1010 Introduction to Equine Management F (2-6) [1.00]**

This course provides the basis for understanding the equine industry, both from a practical and a theoretical perspective. Students will participate in daily routine care and management procedures, and learn basic techniques such as horse handling, grooming, bandaging, blanketing, tack, tractor driving and fire safety. Horse-environment interactions will focus on equine behaviour. The relationship of horses with humans will be explored from ancient through to modern times, including breeding for specific equestrian sports, prominent horsemen/women, and the variety of career options. Current issues will be explored including economic status and hot topics in the industry. Students may expect early morning and some weekend assignments. Students must provide their own grooming kit.

*Prerequisite(s): ENVM\*1090 , EQN\*1020 , EQN\*1030 , EQN\*1100 Registration in BBRM.EQM*

*Department(s): Department of Animal Biosciences*

### **EQN\*2040 Equine Anatomy and Physiology W (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\*1050*

*Restriction(s): Registration in BBRM.EQM*

*Department(s): Department of Animal Biosciences*

### **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\*1050*

*Restriction(s): Registration in BBRM.EQM*

*Department(s): Department of Animal Biosciences*

### **EQN\*2060 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 equine events either on or off campus.

*Prerequisite(s): EQN\*1010*

*Restriction(s): EQN\*1060 Registration in BBRM.EQM*

*Department(s): Department of Animal Biosciences*

### **EQN\*2070 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 equine events either on or off campus.

*Prerequisite(s): EQN\*2060*

*Restriction(s): EQN\*1070 Registration in BBRM.EQM*

*Department(s): Department of Animal Biosciences*

### **EQN\*2150 Equine Facility Management and Design W (3-2) [0.50]**

This course introduces students to the design, development and management of an equine facility. Aspects of the building, renovating and management of horse facilities including site planning and interior design are presented. Special consideration is given to environmental control, waste management and environmental stewardship. Management topics include theoretical and practical skills, interacting with people, recruiting, supervising, motivating, training employees, effective listening, dealing with difficult people, group dynamics and leadership.

*Restriction(s): AGR\*2100 , EQN\*1050 , EQN\*2020 Registration in BBRM.EQM*

*Department(s): Department of Animal Biosciences*

### **EQN\*2200 Equine Industry Trends and Issues I F (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 in classroom discussions and reflective critical thinking.

*Prerequisite(s): EQN\*1010*

*Restriction(s): Registration in BBRM.EQM*

*Department(s): Department of Animal Biosciences*

### **EQN\*2500 Equine Field Course F (0-4) [0.50]**

In this 10-day field course, students will tour a selected area, 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 or EQN\*2150*

*Restriction(s): Registration in BBRM.EQM. Instructor consent required.*

*Department(s): Department of Animal Biosciences*

### **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)*

*Department(s): Department of Animal Biosciences*

### **EQN\*3060 Equine Reproduction W (3-3) [0.50]**

Students will develop a solid foundation in reproductive endocrinology and physiology in the stallion and the mare, emphasis on physiology, breeding management and recognition of common reproductive problems in stallion, mare or foal. Practical experience includes dissection of reproductive tracts, semen collection and evaluation.

*Prerequisite(s): BIOL\*1090, EQN\*2040*

*Restriction(s): Registration in BBRM.EQM*

*Department(s): Department of Animal Biosciences*

### **EQN\*3070 Equine Health Management F (3-3) [0.50]**

This course asks the equine student to apply principles of management to knowledge of the equine industry, equine facility design, biological systems and equine anatomy and physiology. The role of management in the optimization of the health of the horse is critical to success in the industry. Fundamental principles of horse health will be introduced including important indicators of individual and herd health, record keeping and the role of management in disease causation. Application of current, scientifically based management principles and techniques will ask the student to develop both proactive and reactive decision making skills in the context of equine health management.

*Prerequisite(s): EQN\*2040*

*Restriction(s): Registration in BBRM.EQM*

*Department(s): Department of Animal Biosciences*

### **EQN\*3150 Equine Exercise Physiology Laboratory W (0-3) [0.50]**

This course is an additional laboratory component to complement EQN\*3050. Lab exercises focus on the practical application of theoretical knowledge to develop an understanding for the basic physiological principles of muscle contraction and fatigue, thermoregulation, energy utilization under differing exercise intensities, and how these principles can be applied to differential training strategies for equine athletes.

*Prerequisite(s): ANSC\*3080, EQN\*2040, EQN\*2050*

*Co-requisite(s): EQN\*3050*

*Restriction(s): Registration in BBRM.EQM*

*Department(s): Department of Animal Biosciences*

### **EQN\*4020 Advanced Equine Nutrition 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\*2050 or NUTR\*3210*

*Department(s): Department of Animal Biosciences*

### **EQN\*4400 Equine Industry Trends and Issues II F (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): 12.50 credits including EQN\*2200*

*Restriction(s): Registration in BBRM.EQM*

*Department(s): Department of Animal Biosciences*

**EQN\*4500 Equine Integrated Project F (0-6) [1.00]**

This course facilitates education, communication and an exchange of ideas between students and equine businesses to enhance the development of the equine industry and its leaders. Student teams work together with an existing equine enterprise to develop and carry out a hands-on research project that is of benefit to the business owner. Students apply the knowledge gained in preceding courses in a holistic approach to the project as a culmination of their learning.

*Prerequisite(s):* 15.00 credits

*Restriction(s):* EQN\*3500 , Registration in BBRM.EQM

*Department(s):* Department of Animal Biosciences

## European Studies

*School of Languages and Literatures*

### **EURO\*1100 European Cinema F (4-0) [0.50]**

This course will examine European cinema in a socio-political context. It will focus on the interaction between aesthetic and narrative choices, and the political and cultural conditions in Europe. The topics to be discussed in the course will centre on major movements in European cinema, such as Italian Neo-Realism and the French New Wave, film genre, the representation of gender, national and ethnic identity, European versus Hollywood filmmaking, national and transnational cinema.

*Department(s): School of Languages and Literatures*

### **EURO\*2200 Towards European Modernism W (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, Freud), avant-garde movements and innovation in the arts and letters (e.g. impressionism, futurism, expressionism, surrealism).

*Prerequisite(s): 2.00 credits*

*Department(s): School of Languages and Literatures*

### **EURO\*3000 Revolution and the Fantastic in European Culture W (3-0) [0.50]**

This course explores how European writers and artists of the late 18th and early 19th centuries used the fantastic and exotic to promote or respond to socio-political change and revolution. The Enlightenment, Romanticism and the French Revolution are the main focus. This interdisciplinary course will consider literature, the visual arts and music.

*Prerequisite(s): 7.50 credits*

*Restriction(s): EURO\*1200*

*Department(s): School of Languages and Literatures*

### **EURO\*3300 Violence and Culture F (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, the social and political events that led to the fall of the Berlin Wall), 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): 7.50 credits*

*Restriction(s): EURO\*2300*

*Department(s): School of Languages and Literatures*

### **EURO\*3700 Experiential Learning and Language S,F,W (0-0) [0.50]**

This course provides an opportunity for independent study based on an experiential project in European Studies. The project (approximately 70 hours) must be approved by a faculty member in the School of Languages and Literatures. It will include research about experiential learning, a reflective piece of writing and a public oral presentation about the project.

*Prerequisite(s): 10.00 credits including 1.50 credits in European Studies.*

*Restriction(s): A minimum cumulative average of 70% in all European Studies course attempts. Instructor consent required.*

*Department(s): School of Languages and Literatures*

### **EURO\*4050 Contemporary Europe. New Landscapes in the Post-Cold War Era F (3-0) [0.50]**

This course examines the major trends and developments in European culture and society since the end of the Cold War and the post-1989 geo-political, social and cultural events. The course will focus on literature, film, art, political and economic theory and will address Europe's transcontinental relationships, inter-European immigration, the role of religious and cultural minorities, the impact of the financial crisis on the Eurozone and its repercussions on the social and cultural life of Europeans.

*Prerequisite(s): 10.00 credits*

*Department(s): School of Languages and Literatures*

### **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\*1100, EURO\*1200 , EURO\*2200, EURO\*2300 ,EURO\*3000, EURO\*3300, HIST\*2510, HIST\*3090 , MUSC\*1060, POLS\*3450)*

*Department(s): School of Languages and Literatures*

### **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): 10.00 credits including, (EURO\*1100 or EURO\*1200 ), EURO\*2200, EURO\*3000, EURO\*3300*

*Restriction(s): Approval of the Coordinator for the European Studies Program.*

*Department(s): School of Languages and Literatures*

## 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 B.Sc. Biological and Pharmaceutical Chemistry.

### 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 BSCH.BPCH and BSCH.BPCH:C

*External Course Code(s):* Seneca #PHT-533

*Department(s):* Department of Chemistry

### 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 BSCH.BPCH and BSCH.BPCH:C

*External Course Code(s):* Seneca #OCC-433

*Department(s):* Department of Chemistry

### 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):* BIOC\*2580, CHEM\*2400

*Restriction(s):* Restricted to BSCH.BPCH and BSCH.BPCH:C

*External Course Code(s):* Seneca #PHA-533

*Department(s):* Department of Chemistry

### XSEN\*3070 Pharmaceutical Product Formulations 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 BSCH.BPCH and BSCH.BPCH:C

*External Course Code(s):* Seneca #PPF-633

*Department(s):* Department of Chemistry

### XSEN\*3090 Biopharmaceuticals 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 . Restricted to BSCH.BPCH and BSCH.BPCH:C

*External Course Code(s):* Seneca #BPH-633

*Department(s):* Department of Chemistry

### XSEN\*3200 Pharmaceutical Organic Chemistry W (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

*Restriction(s):* XSEN\*4020 . Restricted to BSCH.BPCH and BSCH.BPCH:C

*External Course Code(s):* Seneca #PAC-633

*Department(s):* Department of Chemistry

### XSEN\*3210 Introduction to Pharmaceutical Manufacturing W (2-3) [0.50]

This laboratory oriented course is intended to introduce students to the world of pharmaceutical analysis and manufacturing. Certain select physical and chemical techniques used in the control of raw materials and finished dosage forms are emphasized. Topics will include the methods and equipment required to produce solid dosages.

*Prerequisite(s):* CHEM\*2700

*Restriction(s):* Restricted to BSCH.BPCH and BSCH.BPCH:C

*External Course Code(s):* Seneca #IPM-472

*Department(s):* Department of Chemistry

## 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.

*Offering(s):* Also offered through Distance Education format.

*Restriction(s):* Not available to Child, Youth & Family or Child, Youth & Family Co-op majors.

*Department(s):* Department of Family Relations and Applied Nutrition

### 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.

*Offering(s):* Also offered through Distance Education format.

*Equate(s):* FRHD\*2010

*Department(s):* Department of Family Relations and Applied Nutrition

### 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. Some restrictions may apply during some time periods.

*Department(s):* Department of Family Relations and Applied Nutrition

### 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).

*Department(s):* Department of Family Relations and Applied Nutrition

### 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, FRHD\*1100, PSYC\*1000, PSYC\*1100 , PSYC\*1200 , SOC\*1100

*Department(s):* Department of Family Relations and Applied Nutrition

### 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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 4.50 credits

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* Department of Family Relations and Applied Nutrition

### FRHD\*2110 Exceptional Children and Youth F (3-0) [0.50]

This course provides an overview of childhood exceptionailities 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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* FRHD\*1020, [1 of FRHD\*2060, FRHD\*2260, FRHD\*2280, (FRHD\*2270 or PSYC\*2450)]

*Department(s):* Department of Family Relations and Applied Nutrition

### 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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 1 of ANTH\*1150, FRHD\*1010, FRHD\*1100, PSYC\*1000, PSYC\*1100 , PSYC\*1200 , SOC\*1100

*Department(s):* Department of Family Relations and Applied Nutrition

### 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):* 1 of ANTH\*1150, FRHD\*1010, FRHD\*1100, PSYC\*1000, PSYC\*1100 , PSYC\*1200 , SOC\*1100

*Restriction(s):* PSYC\*2450

*Department(s):* Department of Family Relations and Applied Nutrition

### FRHD\*2280 Adolescent Development W (3-0) [0.50]

This course examines psychosocial development in adolescence, emphasizing physiological, social and emotional changes.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 1 of ANTH\*1150, FRHD\*1010, FRHD\*1100, PSYC\*1000, PSYC\*1100 , PSYC\*1200 , SOC\*1100

*Department(s):* Department of Family Relations and Applied Nutrition

### FRHD\*2400 Introduction to Human Services W (3-0) [0.50]

This course explores the roles, responsibilities and competencies of work in human services, emphasizing the development of professional knowledge, skills and ethical values for working with individuals and families in a variety of settings. Major topics covered in this course will include working with diverse populations, developing professional communication skills, professional values and ethical practice, self-awareness, self-care, career exploration, program planning and implementation

*Prerequisite(s):* 1 of FRHD\*1010, FRHD\*2060, FRHD\*2270, FRHD\*2280, PSYC\*2450

*Restriction(s):* FRHD\*2300 , FRHD\*2350 . Restricted to students in BASc CYF, CYF:C, ADEV, ADEV:C

*Department(s):* Department of Family Relations and Applied Nutrition

### 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\*2060, FRHD\*2260, FRHD\*2270, FRHD\*2280, PSYC\*2450)

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* Department of Family Relations and Applied Nutrition

### 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)

*Department(s):* Department of Family Relations and Applied Nutrition

### 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.

*Department(s):* Department of Family Relations and Applied Nutrition

### FRHD\*3090 Poverty and Health W (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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 9.50 credits including (FRHD\*1010 or FRHD\*1100)

*Department(s):* Department of Family Relations and Applied Nutrition

### 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 or PSYC\*2450), FRHD\*2280

*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 departmental website for more information.

*Department(s):* Department of Family Relations and Applied Nutrition

### FRHD\*3180 Observation and Assessment Laboratory F (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\*2110, (1 of FRHD\*2040, FRHD\*2300 , FRHD\*2400)

*Department(s):* Department of Family Relations and Applied Nutrition

**FRHD\*3190 Administration of Programs for Children S,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.

*Offering(s):* Offered through Distance Education format only. Offered in even-numbered years in the winter semester. Offered in odd-numbered years in the summer semester. First offering - for summer semester - Summer 2019

*Prerequisite(s):* 7.00 credits including (1 of FRHD\*2260, FRHD\*2270, PSYC\*2450)

*Department(s):* Department of Family Relations and Applied Nutrition

**FRHD\*3200 Practicum I: 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\*2040

*Co-requisite(s):* FRHD\*3180, FRHD\*3400

*Restriction(s):* Registration in the B.A.Sc. program (Child, Youth and Family or Child, Youth and Family Co-op majors). Instructor consent required.

*Department(s):* Department of Family Relations and Applied Nutrition

**FRHD\*3250 Practicum I: 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\*2300 or FRHD\*2400

*Co-requisite(s):* FRHD\*3180, FRHD\*3400

*Restriction(s):* Registration in the B.A.Sc. program (Child, Youth and Family or Child, Youth and Family Co-op majors). Instructor consent required.

*Department(s):* Department of Family Relations and Applied Nutrition

**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 or FRHD\*2400

*Co-requisite(s):* FRHD\*3400

*Restriction(s):* Restricted to students in B.A.Sc. ADEV, ADEV:C, ADFW, ADFW:C. Instructor consent required.

*Department(s):* Department of Family Relations and Applied Nutrition

**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):* 4.50 credits including (FRHD\*1020 or FRHD\*1100)

*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 departmental website for more information.

*Department(s):* Department of Family Relations and Applied Nutrition

**FRHD\*3500 Research Internship S,F,W (0-6) [0.50]**

This course will give students a direct, initial experience in conducting research in Family Relations and Human Development. The internship focuses on familiarizing students with the research process and building research skills through active engagement in research under the direct guidance of a faculty member.

*Prerequisite(s):* FRHD\*3070, STAT\*2090

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Family Relations and Applied Nutrition

**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

*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 departmental website for more information.

*Department(s):* Department of Family Relations and Applied Nutrition

**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.

*Department(s):* Department of Family Relations and Applied Nutrition

**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.

*Department(s):* Department of Family Relations and Applied Nutrition

**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):* 14.50 credits including FRHD\*2060

*Department(s):* Department of Family Relations and Applied Nutrition

**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 Relations and Human Development, Psychology or Sociology

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* Department of Family Relations and Applied Nutrition

**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

*Department(s):* Department of Family Relations and Applied Nutrition

**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

*Department(s):* Department of Family Relations and Applied Nutrition

**FRHD\*4260 Social Policy and Gerontology W (3-0) [0.50]**

This course examines aging and adult development in relation to social policy with special reference to families.

*Prerequisite(s):* 9.50 credits including FRHD\*2060

*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 departmental website for more information.

*Department(s):* Department of Family Relations and Applied Nutrition

**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.

*Department(s):* Department of Family Relations and Applied Nutrition

**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, hospitals). The complexities of professional practice with diverse populations are explored in depth. Professional communication skills and relevant legal aspects are also addressed.

*Prerequisite(s):* 14.00 credits including FRHD\*3400

*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 departmental website for more information.

*Department(s):* Department of Family Relations and Applied Nutrition

**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):* 9.50 credits

*Co-requisite(s):* FRHD\*3040

*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 departmental website for more information.

*Department(s):* Department of Family Relations and Applied Nutrition

**FRHD\*4330 Practicum II: Child F,W (3-6) [1.00]**

This course enables students to extend their knowledge and professional skills in a second supervised placement working with children in a health, education 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.

*Prerequisite(s):* FRHD\*3200 or FRHD\*3250

*Restriction(s):* FRHD\*4170 , FRHD\*4290, FRHD\*4340, Restricted to students in CYF and CYF:C major. Instructor consent required.

*Department(s):* Department of Family Relations and Applied Nutrition

**FRHD\*4340 Practicum II: Youth F,W (3-6) [1.00]**

This course enables students to extend their knowledge and professional skills in a second supervised placement working with youth 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.

*Prerequisite(s):* FRHD\*3200 or FRHD\*3250

*Restriction(s):* FRHD\*4170 , FRHD\*4290, FRHD\*4330, Restricted to students in CYF and CYF:C major. Instructor consent required.

*Department(s):* Department of Family Relations and Applied Nutrition

**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):* 14.00 credits including (1 of FRHD\*1010, FRHD\*2060, FRHD\*2270, FRHD\*2280, PSYC\*2450)

*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 departmental website for more information.

*Department(s):* Department of Family Relations and Applied Nutrition

**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.

*Department(s):* Department of Family Relations and Applied Nutrition

**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

*Department(s):* Department of Family Relations and Applied Nutrition

## Food, Agricultural and Resource Economics

Department of Food, Agricultural and Resource Economics

### FARE\*1040 Intro to Environmental Economics, Law & Policy W (5-0) [1.00]

This course introduces students to a social science and policy perspective on environmental issues. The course emphasizes interactions among market exchange relationships, policy actions and legal rules and institutions. The role of scientific evidence in the resolution of environmental disputes is considered. Students participate in exercises representing different roles in environmental litigation.

*Restriction(s):* ECON\*1050 Registration in BBRM.EM, BSES, BSES:C.

*Department(s):* Department of Food, Agricultural and Resource Economics

### 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):* AGEC\*1300

*Department(s):* Department of Food, Agricultural and Resource Economics

### FARE\*1400 Economics of the Agri-Food System W (4-0) [1.00]

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.

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Food, Agricultural and Resource Economics

### 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):* FARE\*1040 or FARE\*1400

*Department(s):* Department of Food, Agricultural and Resource Economics

### 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):* 1 of ECON\*1050, FARE\*1040, FARE\*1400

*Equate(s):* AGEC\*2700

*Department(s):* Department of Food, Agricultural and Resource Economics

### FARE\*3000 Food Industry Analysis and Policy F (3-0) [0.50]

This course explores the structure and functioning of the post-farm gate food sector through an applied industrial organization lens. Attention focuses on: the economic and business structure of the post-farm gate food industry; the economics of research and development, and innovation and commercialization in the food sector; the price and non-price strategies used in the industry; the economics of food safety and quality; and regulations and standards as it relates to food processing, distribution and retailing.

*Offering(s):* First offering - Fall 2019

*Prerequisite(s):* 9.50 credits including (1 of ECON\*1050, FARE\*1040, FARE\*1400), (1 of ECON\*2740, STAT\*2040, STAT\*2060)

*Department(s):* Department of Food, Agricultural and Resource Economics

### 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):* AGEC\*3030

*Department(s):* Department of Food, Agricultural and Resource Economics

### FARE\*3170 Cost-Benefit Analysis W (3-0) [0.50]

The primary objective of this course is to introduce students to the basic principles of Cost-Benefit Analysis so that they can evaluate the worthiness of a public project or policy. Special emphasis is given to the trade-offs associated with agricultural, environmental and natural resource policies.

*Prerequisite(s):* 1 of ECON\*2100, ECON\*2310, ECON\*2650, FARE\*2700

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Food, Agricultural and Resource Economics

### FARE\*3250 Food and International Development F (3-0) [0.50]

This course provides students with an economic perspective on issues in international development related to food, agriculture, and household behaviors. Different economic theories and approaches are used to understand various economic phenomena in the development context. Students are encouraged to consider critically an economic approach to the analysis of development issues related to food and agriculture, alongside the perspectives of other social science disciplines. Throughout the course, food and agriculture as development issues are considered primarily on a micro level, with a special focus on household behavior and decision-making.

*Prerequisite(s):* (FARE\*1040 or ECON\*1050), (FARE\*1300 or ECON\*1100)

*Department(s):* Department of Food, Agricultural and Resource Economics

### 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):* (ACCT\*1220 or ACCT\*2220 ), (1 of ECON\*2740, PSYC\*1010, STAT\*2040, STAT\*2060, STAT\*2080, STAT\*2120)

*Restriction(s):* HTM\*3120. This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Food, Agricultural and Resource Economics

### FARE\*3320 Supply and Value Chain Management F (4-0) [0.50]

This course focuses on the coordination of decision-making along food industry supply chains and networks to achieve strategic and operational goals. This course uses a case-based approach to instruct students in the principles of supply chain management and key concepts for the analysis of supply chain management issues.

*Offering(s):* First offering - Fall 2019

*Prerequisite(s):* FARE\*3310

*Department(s):* Department of Food, Agricultural and Resource Economics

### 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):* AGEC\*4000

*Department(s):* Department of Food, Agricultural and Resource Economics

### FARE\*4210 World Agriculture, Food Security and Economic Development F (3-0) [0.50]

This course examines the role of agriculture in determining food security within developing countries and in promoting overall processes of economic development. The course uses economic concepts to understand the inter-relationships between agriculture system and access to food, including the supply of food and the livelihoods of those engaged in the agri-food system. Analyses of economic policies and programs in developing countries and their effect on poverty, food security and economic development are conducted.

*Prerequisite(s):* 10.00 credits including (FARE\*1040 or ECON\*1050), ECON\*1100

*Department(s):* Department of Food, Agricultural and Resource Economics

### FARE\*4220 Advanced Agribusiness Management W (3-0) [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 FARE\*2410, BUS\*3320 , ECON\*2770, MGMT\*3320

*Department(s):* Department of Food, Agricultural and Resource Economics

**FARE\*4240 Futures and Options Markets W (3-0) [0.50]**

This course is 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):** 10.00 credits including (1 of ECON\*2560, ECON\*3560 , FARE\*2410, MGMT\*3320)

**Restriction(s):** This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

**Department(s):** Department of Food, Agricultural and Resource Economics

**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.

**Prerequisite(s):** (FARE\*2700, or ECON\*2310) 0.50 credits at the 3000 or 4000 level in FARE or ECON

**Department(s):** Department of Food, Agricultural and Resource Economics

**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 FARE\*2700, ECON\*2310, ECON\*2100), 0.50 credits at the 3000 or 4000 level in FARE or ECON

**Department(s):** Department of Food, Agricultural and Resource Economics

**FARE\*4330 Advanced Operations Management W (4-0) [0.50]**

This course focuses on the decision-making role of the operations manager. It provides students with the opportunity to explore and apply their knowledge in a case-based and project-based course addressing operations issues and topics in the food industry. The course focuses on the fundamental concepts, issues, and techniques for efficient and effective operations. Topics include location strategy, process strategy, forecasting, inventory management, scheduling, project management, queuing management, supply chain management, lean operations and maintenance.

**Offering(s):** First offering - Winter 2020

**Prerequisite(s):** FARE\*3320

**Department(s):** Department of Food, Agricultural and Resource Economics

**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):** 1 of ECON\*2740, PSYC\*1010, PSYC\*2040 , STAT\*2040, STAT\*2050, STAT\*2060, STAT\*2080

**Equate(s):** AGEC\*4360

**Department(s):** Department of Food, Agricultural and Resource Economics

**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, AGEC\*2230 , BUS\*2230 , COST\*2600 , MCS\*2600)

**Equate(s):** AGEC\*4370 , MCS\*4370

**Restriction(s):** This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

**Department(s):** Department of Food, Agricultural and Resource Economics

**FARE\*4380 Retailing, Merchandising and Sales W (3-0) [0.50]**

This course explores the merchandising and sales function, strategies and practices used by the retail food sector. The course includes development and application of concepts tied to effective sales management, as well as strategies and approaches to undertaking retail merchandising. Where relevant, focus is placed on business-to-business or business-to-consumer approaches. Students will learn to plan, execute, and evaluate sales and retail merchandising programs in a variety of alternative distribution channels.

**Offering(s):** First offering - Winter 2020

**Prerequisite(s):** FARE\*3320, FARE\*4370

**Restriction(s):** MCS\*4060

**Department(s):** Department of Food, Agricultural and Resource Economics

**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):** AGEC\*4500

**Department(s):** Department of Food, Agricultural and Resource Economics

**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 AGEC\*2410 , AGEC\*2700 , AGR\*2401/2 , FARE\*2410, FARE\*2700

**Equate(s):** AGEC\*4550

**Restriction(s):** Instructor consent required. Permission of the instructor and Chair of the Department of Food, Agricultural and Resource Economics is required.

**Department(s):** Department of Food, Agricultural and Resource Economics

**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 AGEC\*2410 , AGEC\*2700 , AGR\*2401/2 , FARE\*2410, FARE\*2700

**Equate(s):** AGEC\*4560

**Restriction(s):** Instructor consent required. Permission of the instructor and Chair of the Department of Food, Agricultural and Resource Economics is required.

**Department(s):** Department of Food, Agricultural and Resource Economics

## 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.

*Offering(s):* Offered through Distance Education format only.

*Restriction(s):* FOOD\*2150, FOOD\*3090, NUTR\*2150

*Department(s):* Department of Food Science

### 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 BSC.FOOD, BSC.FOOD:C, BBRM.FIM, BBRM.FIM:C majors

*Department(s):* Department of Food Science

### 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. (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 BASC.AHN major.

*Department(s):* Department of Food Science

### 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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* CHEM\*1040

*Restriction(s):* FOOD\*3030, FOOD\*3050

*Department(s):* Department of Food Science

### 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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* CHEM\*1040, (1 of BIOL\*1040 , BIOL\*1070, BIOL\*1080, MICR\*2420)

*Restriction(s):* FOOD\*3160. FOOD\*3170 Not available to students registered in BSC.FOOD or BSC.FOOD:C majors.

*Department(s):* Department of Food Science

### 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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 1 of BIOL\*1040 , BIOL\*1070, MICR\*2420

*Restriction(s):* FOOD\*3230. FOOD\*3240. Not available to students registered in BSC.FOOD or BSC.FOOD:C majors.

*Department(s):* Department of Food Science

### 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), (1 of MATH\*1030, MATH\*1080, MATH\*1200)

*Department(s):* Department of Food Science

### 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

*Restriction(s):* Registration is limited to students registered in the BSCH.FOOD, FOOD:C or BASC.AHN majors.

*Department(s):* Department of Food Science

### 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. This course will discuss topics related to the chemistry (physical, organic and analytical) and physics of emulsions and emulsifiers, pigments, flavours and flavour perception, enzymes and processing additives.

*Prerequisite(s):* FOOD\*3030

*Restriction(s):* Registration is limited to students registered in the BSCH.FOOD or FOOD:C majors.

*Department(s):* Department of Food Science

### FOOD\*3050 Food Chemistry I F (3-0) [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. This course is the same as FOOD\*3030, without the laboratory component.

*Prerequisite(s):* BIOC\*2580

*Restriction(s):* FOOD\*2400, FOOD\*3030. Not available to students registered in BSCH.FOOD or FOOD:C majors.

*Department(s):* Department of Food Science

### FOOD\*3060 Food Chemistry II W (3-0) [0.50]

This course covers the fundamental principles of the chemistry of foods, as a continuation of FOOD\*3030. This course will discuss topics related to the chemistry (physical, organic and analytical) and physics of emulsions and emulsifiers, pigments, flavors and flavor perception, enzymes and processing additives. This course is the same as FOOD\*3040, without the laboratory component.

*Prerequisite(s):* FOOD\*3030 or FOOD\*3050

*Restriction(s):* FOOD\*3040. Not available to students registered in BSC.FOOD or BSC.FOOD:C majors.

*Department(s):* Department of Food Science

### FOOD\*3090 Food Science and Human Nutrition F (3-2) [0.50]

This course will introduce students 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 or AGR\*1110), (1 of BIOL\*1040 , BIOL\*1050, BIOL\*1080), CHEM\*1040

*Restriction(s):* FOOD\*2010, FOOD\*2150, NUTR\*2150. Restricted to students in BSC(Agr) as well as students in the Minor in Agriculture.

*Department(s):* Department of Food Science

### FOOD\*3140 Food Processing I F (3-0) [0.50]

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.

*Offering(s):* First offering - Fall 2020

*Prerequisite(s):* ENGG\*2660 or [FOOD\*2620, ( MICR\*2030 or MICR\*2420)]

*Restriction(s):* FOOD\*3160. Not available to students registered in BSC.FOOD or BSC.FOOD:C

*Department(s):* Department of Food Science

### 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)]

*Department(s):* Department of Food Science

**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\*3140 or FOOD\*3160

*Department(s):* Department of Food Science

**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):* MICR\*2420

*Restriction(s):* FOOD\*2420, FOOD\*3240 Restricted to students in BSCH.FOOD, FOOD:C, MICR, MICR:C and BASC.AHN majors.

*Department(s):* Department of Food Science

**FOOD\*3240 Food Microbiology F (3-0) [0.50]**

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. This course is the same as FOOD\*3230, without the laboratory component.

*Prerequisite(s):* MICR\*2420

*Restriction(s):* FOOD\*2420, FOOD\*3230 Not available to students registered in BSC.FOOD or BSC.FOOD:C majors.

*Department(s):* Department of Food Science

**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):* MICR\*2420

*Restriction(s):* FOOD\*3270 Students must be of legal drinking age in the Province of Ontario. Restricted to students in BSCH.FOOD, FOOD:C, MICR or MICR:C majors

*Department(s):* Department of Food Science

**FOOD\*3270 Industrial Microbiology W (3-0) [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. Field trips to a commercial winery and brewery will also aid the learning experience. This course is the same as FOOD\*3260, without the laboratory component.

*Prerequisite(s):* MICR\*2420

*Restriction(s):* FOOD\*3260 Students must be of legal drinking age in the Province of Ontario. Not available to students registered in BSC.FOOD or BSC.FOOD:C majors.

*Department(s):* Department of Food Science

**FOOD\*3430 Introduction to Food Analysis F (3-0) [0.50]**

This course offers an introduction to quantitative analysis of foods by chemical, physical and instrumental means. Determination of both major and minor constituents of foods are discussed.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* FOOD\*2400

*Restriction(s):* FOOD\*4120 , FOOD\*4190

*Department(s):* Department of Food Science

**FOOD\*3700 Sensory Evaluation of Foods W (3-3) [0.50]**

This course is an introduction to sensory science. Students will gain an understanding of the factors contributing to sensory perception of foods. Sensory methodology and statistical tools for evaluation of all sensory aspects of food will be provided and all students will gain hands-on experience with implementation, statistical analysis and interpretation of sensory data. Consumer sensory testing methods will also be discussed.

*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, BBRM.FIM, BBRM.FIM:C, BCOM.HTM, BCOM.HTM:C or BASC.AHN during certain periods.

*Department(s):* Department of Food Science

**FOOD\*4020 Quality Management in the Food Industry W (4-0) [0.50]**

Quality management is a business philosophy that focuses on maximizing customer satisfaction by ensuring the provision of products or services that consistently meet or exceed customer expectations. In this course, the student will come to understand the various definitions of quality as well as various quality management systems that are relevant to the food industry. The student will also gain an understanding of the crucial role of continuous improvement and monitoring customer satisfaction within the food industry. This course uses traditional lectures by the instructor and by guests from organizations that produce, ship, sell or regulate food products.

*Offering(s):* First offering - Winter 2022

*Prerequisite(s):* FARE\*3310, FOOD\*3170

*Department(s):* Department of Food Science

**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):* 7.00 credits in science or engineering

*Department(s):* Department of Food Science

**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. Also listed as NUTR\*4090.

*Prerequisite(s):* NUTR\*3210

*Equate(s):* NUTR\*4090

*Department(s):* Department of Food Science, Department of Human Health and Nutritional Sciences

**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.

*Prerequisite(s):* 1 of ANSC\*2340, FOOD\*3090, FOOD\*3140, FOOD\*3160

*Department(s):* Department of Food Science

**FOOD\*4190 Advanced Food Analysis F (3-3) [0.50]**

In this course the quantitative analysis of foods by chemical and physical methods will be studied with emphasis on modern/advanced technologies. Both major and minor constituents will be discussed.

*Prerequisite(s):* 1 of CHEM\*2400, CHEM\*2480, FOOD\*3030, FOOD\*3050

*Co-requisite(s):* Pre-requisites may be taken as co-requisites

*Restriction(s):* FOOD\*4120

*Department(s):* Department of Food Science

**FOOD\*4220 Topics in Food Science S,F,W (0-3) [0.50]**

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):* 14.00 credits including 1.50 credits at the 3000 level or higher in Food Science.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Food Science

**FOOD\*4230 Research in Food Science S,E,W (0-3) [0.50]**

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

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Food Science

**FOOD\*4260 Food Product Development I F (3-3) [0.50]**

This course examines the research and development process related to new food products. Through a series of lectures and presentations students will learn the underlying theory behind food product development including idea generation, prototype development and new product manufacturing, evaluation and product marketing. Students will also gain a real world understanding of the process through their involvement and interaction with invited industry speakers. Students will work in teams with students from other disciplines to plan a food product development project.

*Prerequisite(s):* FOOD\*2100, (FOOD\*3030 or FOOD\*3050), (FOOD\*3140 or FOOD\*3160), (FOOD\*3230 or FOOD\*3240), FOOD\*3700

*Restriction(s):* FOOD\*4100 , FOOD\*4700 , MGMT\*4020, MGMT\*4030

*Department(s):* Department of Food Science

**FOOD\*4270 Food Product Development II W (3-3) [0.50]**

This course will compliment the Food Product Development I course by further assisting students in gaining a comprehensive understanding of the principles and process of food product development. Students will use the theory obtained from the Food Product Development I course to put into practice and gain real life experience in the planning, conducting, and communicating results as a team while developing a pre-approved food product.

*Prerequisite(s):* FOOD\*4260

*Restriction(s):* MGMT\*4020, MGMT\*4030

*Department(s):* Department of Food Science

**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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* (FOOD\*2010 or FOOD\*2150), (1 of FOOD\*2410, FOOD\*3140, FOOD\*3160), (1 of FOOD\*2420, FOOD\*3230, FOOD\*3240 )

*Department(s):* Department of Food Science

**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.

*Prerequisite(s):* BIOC\*2580, (FOOD\*2150 or FOOD\*3090), ( MICR\*2030 or MICR\*2420)

*Department(s):* Department of Food Science

**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), (1 of AGR\*2470, FOOD\*2150, FOOD\*3090, NUTR\*3210)

*Department(s):* Department of Food Science

## 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. To that end, students will be asked to fill out a placement questionnaire at the beginning of the course. Literary texts are, at all levels, studied in French. Students registering in these courses will be expected to have the appropriate language proficiency. Courses up to and including FREN\*1200 should be taken in sequence (with the exclusion of FREN\*1010); they should not be taken concurrently.

Francophone students will not normally be admitted into FREN\*1200 and FREN\*1300. It is recommended they start their program with FREN\*2020, FREN\*2060, FREN\*2500, or FREN\*2520 with the approval of the Faculty Advisor.

The following courses are all intended to improve the students' ability to communicate in French. Use the following chart to determine the appropriate course in which to begin French studies.

#### Entry points for French studies

FRENCH BACKGROUND	REGISTER IN
Ontario Grade 9 core or less	FREN*1090 DE
Ontario Grade 10 core or less	FREN*1100 DE
Ontario Grade 11 core	FREN*1150
Ontario Grade 12 core	FREN*1200
Ontario Grade 12 immersion	FREN*1300
Not sure	Contact the <a href="#">School of Languages and Literatures</a> in order to arrange a placement test with a faculty advisor

### FREN\*1010 Independent French Study S,F (3-0) [0.50]

This course, offered in an intensive immersion format, provides students with the opportunity to boost and strengthen skills in French, both written and oral. This course is connected to the Explore Program which is offered in a francophone setting. Please see the School of Languages and Literatures for further information. A pass/fail grade will be assigned upon completion of the course.

**Restriction(s):** Permission of French Studies, School of Languages and Literatures. Instructor consent required.

**Department(s):** School of Languages and Literatures

### FREN\*1090 Basic French: Reading S,F (3-0) [0.50]

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. This course is not intended for students with native or near-native ability in French, including Francophones and French immersion students. Students with advanced French may be dropped from the course.

**Offering(s):** Offered through Distance Education format only.

**Restriction(s):** FREN\*1090 cannot be counted toward a specialization in French.

**Department(s):** School of Languages and Literatures

### FREN\*1100 Basic French: Listening F,W (3-0) [0.50]

This basic course in French grammar will emphasize listening skills, for students who have up to grade 10 French (or equivalent) but not above. This course is not intended for students with native or near-native ability in French, including Francophones and French immersion students. Students with advanced French may be dropped from the course.

**Offering(s):** Offered through Distance Education format only.

**Restriction(s):** FREN\*1100 cannot be counted toward a specialization in French.

**Department(s):** School of Languages and Literatures

### FREN\*1150 Elementary French F,W (3-0) [0.50]

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.

**Restriction(s):** Students with native or near-native ability in French, including Francophones and French immersion students, will not be admitted to this course. FREN\*1150 cannot be counted toward a specialization in French.

**Department(s):** School of Languages and Literatures

### FREN\*1200 French Language I F,W (3-1) [0.50]

A first year, university-level course for students graduating with a high-school background in core French. Students will practise written and oral French.

**Prerequisite(s):** 1 of FREN\*1150, Grade 12U French or permission of the School of Languages and Literatures.

**Restriction(s):** Students with native or near-native ability in French, including Francophones and French immersion students, will not be admitted to this course. This is a Priority Access Course. Some restrictions may apply during some time periods.

**Department(s):** School of Languages and Literatures

### FREN\*1300 French Language II F,W (3-1) [0.50]

This course develops the four language skills in French: reading, writing, listening and speaking through group tasks and activities, grammar exercises and individual writing assignments.

**Prerequisite(s):** FREN\*1200 or equivalent, such as grade 12 French Immersion.

**Restriction(s):** FREN\*2030 This is a Priority Access Course. Some restrictions may apply during some time periods.

**Department(s):** School of Languages and Literatures

### FREN\*2020 France: Literature and Society F,W (4-0) [0.50]

This course provides an historical introduction to French life and thought as seen through literature and art.

**Offering(s):** Also offered through Distance Education format.

**Prerequisite(s):** 1 of FREN\*1200, FREN\*1300, FREN\*2030

**Restriction(s):** This is a Priority Access Course. Some restrictions may apply during some time periods.

**Department(s):** School of Languages and Literatures

### FREN\*2060 Quebec: Literature and Society F,W (4-0) [0.50]

This course provides an historical introduction to Quebec life and thought from New France to the present as seen through literature, politics, history and art.

**Prerequisite(s):** 1 of FREN\*1200, FREN\*1300, FREN\*2030

**Restriction(s):** This is a Priority Access Course. Some restrictions may apply during some time periods.

**Department(s):** School of Languages and Literatures

### FREN\*2500 French Translation I W (3-0) [0.50]

This course provides an introduction to the art and techniques of French-English translation.

**Offering(s):** Also offered through Distance Education format.

**Prerequisite(s):** FREN\*1300 or FREN\*2030

**Department(s):** School of Languages and Literatures

### FREN\*2520 French Composition I F,W (3-0) [0.50]

This course provides students with opportunities to develop further their skills in textual analysis and in writing in French.

**Prerequisite(s):** FREN\*1300 or FREN\*2030

**Restriction(s):** This is a Priority Access Course. Some restrictions may apply during some time periods.

**Department(s):** School of Languages and Literatures

### FREN\*2550 Contemporary France W (3-0) [0.50]

This course examines contemporary French and/or Francophone culture, through a variety of media (music, film, internet, etc), recent history and political events. Emphasis on oral work in French (comprehension and expression).

**Prerequisite(s):** FREN\*1300 or FREN\*2030

**Restriction(s):** FREN\*2540

**Department(s):** School of Languages and Literatures

### FREN\*3030 Good and Evil F (3-0) [0.50]

In this course, we will consider a variety of texts in which the lines between good and evil are blurred, making such categorization difficult. Good and evil will be considered in different locations and in different time periods, at both the microscopic level of characters (heroes and villains) and/or at the macroscopic level (utopias and dystopias). Readings on the ethical challenges characters and societies face, and the decisions they make will be used as the basis for oral and written debates in French.

**Offering(s):** Offered in odd-numbered years.

**Prerequisite(s):** FREN\*2020, FREN\*2060, FREN\*2520

**Department(s):** School of Languages and Literatures

### FREN\*3090 Classics of French Literature W (3-0) [0.50]

This course offers students the opportunity to engage with texts considered part of the French literary canon. What makes a literary classic? Why do some texts stand the test of time, while others disappear or are excluded from the canon? Students will examine these questions and will analyse texts that may range from the plays of Molière and Racine to the novels of recent francophone Nobel-prize winners.

**Offering(s):** Offered in even-numbered years.

**Prerequisite(s):** FREN\*2020, FREN\*2060, FREN\*2520

**Department(s):** School of Languages and Literatures

**FREN\*3110 Storytelling in the Francophone World W (3-0) [0.50]**

This course focuses on storytelling as a genre of folklore in various francophone traditions (French Canadian and American, European, Caribbean, African). Students will consider the functions of storytelling in culture and examine the structural and thematic components of folktales. Students will also explore the nature of storytelling from a performance perspective, reflecting on the elements that make good communication. Put into practice, storytelling will be used as a pedagogical tool to develop speaking, listening, reading and writing skills in French.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* FREN\*2020, FREN\*2060, FREN\*2520

*Department(s):* School of Languages and Literatures

**FREN\*3130 Representing the Self F (3-0) [0.50]**

By examining a variety of texts told by a real or fictional 'I', this course will explore such literary concerns as believable and unbelievable narrators, biography and autobiography and the construction of the self. Students will put to use their learning about the construction of the self in creating their own first person narrative in French.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* FREN\*2020, FREN\*2060, FREN\*2520

*Department(s):* School of Languages and Literatures

**FREN\*3140 Women in Literature, Art and Film W (3-0) [0.50]**

This course will study French or Francophone women as creators of literary, artistic and filmic works or might take the representation of women in literature, art or film as its focus. Drawing on specific contemporary theories, we will study representations of women's place, of the female body, class and linguistic identity, and of the creation of artistic work. Particular attention will be paid to the relationship between the personal and the socio-political spheres, sexual difference, and gender roles.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* FREN\*2020, FREN\*2060, FREN\*2520

*Department(s):* School of Languages and Literatures

**FREN\*3160 Songs, Lyrics and Poetry in French F (3-0) [0.50]**

This course will provide students with the opportunity to explore the cultural richness of song lyrics and poetry in the Francophone world. By engaging with a variety of songs including, but not limited to: traditional folk, political songs ("chansons engagées"), hip-hop to "World music", students will explore several facets of this complex subject. Activities include: in-depth research on the arc of critical reception of a given songwriter or band, comparing the treatment of a specific theme (for example "money" or "apathy" or "nostalgia") across musical genres, researching for a biography of a songwriter/poet (such as Richard Desjardins or Jacques Brel).

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* FREN\*2020, FREN\*2060, FREN\*2520

*Department(s):* School of Languages and Literatures

**FREN\*3170 Fictions of Childhood F (3-0) [0.50]**

This course will examine the classics of francophone children's literature (for example, works by Perrault, la Comtesse de Ségrur, Jules Verne, or Goscinny) and take into account representations of children or childhood in autobiographical texts, novels or film. Students will address questions such as: How did children's literature develop as a separate genre? What are the characteristics of the various types of writing for children (fairy tales, adventure fiction, novels of school and home, fantasy)? What is the function of a child narrator in novels for children or adults?

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* FREN\*2020, FREN\*2060, FREN\*2520

*Department(s):* School of Languages and Literatures

**FREN\*3500 French Translation II F (3-0) [0.50]**

This course introduces students to an analysis of the similarities and contrasts between French and English grammar. As well, the course introduces students to analysis of various literary styles, and to their application in written translation.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* FREN\*2500

*Department(s):* School of Languages and Literatures

**FREN\*3520 French Composition II W (3-0) [0.50]**

This is a continuation of FREN\*2520 with special emphasis on creative writing.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* FREN\*2020, FREN\*2060, FREN\*2520

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* School of Languages and Literatures

**FREN\*3610 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.

*Department(s):* School of Languages and Literatures

**FREN\*3620 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

*Department(s):* School of Languages and Literatures

**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.

*Department(s):* School of Languages and Literatures

**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.

*Department(s):* School of Languages and Literatures

**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.

*Department(s):* School of Languages and Literatures

**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.

*Department(s):* School of Languages and Literatures

**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.

*Department(s):* School of Languages and Literatures

**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.

*Department(s):* School of Languages and Literatures

**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.

*Department(s):* School of Languages and Literatures

**FREN\*3700 Experiential Learning and Language S,F,W (0-0) [0.50]**

This course provides an opportunity for independent study based on an experiential project in French Studies. The project (approximately 70 hours) must be approved by a faculty member in the School of Languages and Literatures. It will include research about experiential learning, a reflective piece of writing and a public oral presentation about the project.

*Prerequisite(s):* 10.00 credits including 1.50 credits in French Studies.

*Restriction(s):* A minimum cumulative average of 70% in all French Studies course attempts. Instructor consent required.

*Department(s):* School of Languages and Literatures

**FREN\*4010 The Art of Adaptation F (3-0) [0.50]**

This course examines the relationship between source text and its adaptation(s). The art of adaptation will be addressed through theories of authorship, identity, intertextuality and genre. Students will reflect on the ways artistic creation is achieved by means of repetition and variation, and will analyse the forms and codes of the traditions that are inherited and often transgressed.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 1.00 credits at the 3000-level in French.

*Department(s):* School of Languages and Literatures

**FREN\*4020 Contemporary Francophone Theatre W (3-0) [0.50]**

The focus of this course is French and Québécois plays by twentieth-century dramatists. The approach to the texts will center on the social, political, and cultural contexts of the plays as well as representations of class, gender, and the role of language. The course will look at theatre as text, dramaturgy, spectacle and role-playing, as well as examine the role of theatre in contemporary society.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 1.00 credits at the 3000-level in French.

*Restriction(s):* FREN\*3120

*Department(s):* School of Languages and Literatures

**FREN\*4290 Post-Colonial Francophone Fiction W (3-0) [0.50]**

This is a survey course of the works of 20<sup>th</sup>-century Francophone writers from Maghreb, Black Africa and the Caribbean.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 1.00 credits at the 3000-level in French.

*Department(s):* School of Languages and Literatures

**FREN\*4600 Honours Seminar in French Studies F (3-0) [0.50]**

This course is a seminar on literary genres, movements and themes, or on the French language.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 1.00 credits at the 3000-level in French.

*Department(s):* School of Languages and Literatures

**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):* 1.00 credits at the 3000-level in French.

*Restriction(s):* 70% average in all French Studies course attempts is required, although at least 75% is recommended. Instructor consent required.

*Department(s):* School of Languages and Literatures

**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\*4740

*Restriction(s):* 70% average in all French Studies course attempts is required, although at least 75% is recommended. Instructor consent required.

*Department(s):* School of Languages and Literatures

## 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.*

### GEOG\*1200 Society and Space F (3-1) [0.50]

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.

*Offering(s): Also offered through Distance Education format.*

*Department(s): Department of Geography*

### GEOG\*1220 Human Impact on the Environment F,W (3-0) [0.50]

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.

*Offering(s): Also offered through Distance Education format.*

*Department(s): Department of Geography*

### GEOG\*1300 Introduction to the Biophysical Environment F,W (3-2) [0.50]

This course provides an introduction to physical geography, focusing on the principles and processes governing climate, landforms, and vegetation systems and their interrelationships and will examine natural and human-induced changes to environmental systems. Laboratories will address techniques of measurement, representation and analysis of environmental systems using maps and satellite imagery, laboratory techniques, and field observation.

*Department(s): Department of Geography*

### GEOG\*1350 Earth: Hazards and Global Change F,W (3-0) [0.50]

This course investigates physical aspects of natural hazards that affect people and society and will focus on the natural systems and processes that cause climate variability and change, floods, earthquakes, volcanoes, landslides, hurricanes, tornadoes and other natural disasters.

*Department(s): Department of Geography*

### GEOG\*2000 Geomorphology F (3-2) [0.50]

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.

*Prerequisite(s): 1 of ENGG\*1100, ENVS\*1050 , ENVS\*1060, GEOG\*1300, GEOG\*1350, GEOL\*1050 , GEOL\*1100*

*Restriction(s): This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations.*

*Department(s): Department of Geography*

### GEOG\*2030 Environment and Development F (3-0) [0.50]

This course examines the changing relations between society and ecology by focusing on relations of power, including intra- and inter-state structures and processes. Environmental movements, conflicts, identities and values are considered along with localization and globalization. Particular attention is paid to ecological and development processes and strategies in the developing world.

*Prerequisite(s): 4.00 credits, GEOG\*1220 is recommended*

*Department(s): Department of Geography*

### GEOG\*2110 Climate and the Biophysical Environment W (3-1) [0.50]

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.

*Prerequisite(s): GEOG\*1300 or GEOG\*1350*

*Department(s): Department of Geography*

### GEOG\*2210 Environment and Resources W (3-0) [0.50]

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.

*Offering(s): Also offered through Distance Education format.*

*Prerequisite(s): GEOG\*1220 is recommended*

*Department(s): Department of Geography*

### GEOG\*2230 Commodity Chains and Cultures of Consumption F (3-0) [0.50]

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.

*Prerequisite(s): GEOG\*1200 or GEOG\*1220*

*Department(s): Department of Geography*

### GEOG\*2260 Applied Human Geography W (3-2) [0.50]

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.

*Prerequisite(s): GEOG\*1200 or (ANTH\*1150 and GEOG\*1220)*

*Department(s): Department of Geography*

### GEOG\*2420 The Earth From Space F (2-3) [0.50]

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.

*Prerequisite(s): 0.50 credits in geography and/or earth science*

*Department(s): Department of Geography*

### GEOG\*2460 Analysis in Geography F (3-2) [0.50]

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.

*Prerequisite(s): 0.50 credits at the 1000 level in Geography*

*Department(s): Department of Geography*

### GEOG\*2480 Mapping and GIS F,W (3-2) [0.50]

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.

*Prerequisite(s): 5.00 credits*

*Department(s): Department of Geography*

### GEOG\*2510 Canada: A Regional Synthesis W (3-0) [0.50]

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.

*Department(s): Department of Geography*

### GEOG\*3000 Fluvial Processes F (3-2) [0.50]

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.

*Prerequisite(s): GEOG\*2000, (GEOG\*2460 or STAT\*2040)*

*Department(s): Department of Geography*

### GEOG\*3020 Global Environmental Change F (3-1) [0.50]

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.

*Offering(s): Also offered through Distance Education format.*

*Prerequisite(s): 7.50 credits, (GEOG\*2210 recommended)*

*Department(s): Department of Geography*

**GEOG\*3050 Development and the City W (3-0) [0.50]**

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.

*Prerequisite(s):* 7.50 credits, (GEOG\*2030 and GEOG\*2260 recommended)

*Department(s):* Department of Geography

**GEOG\*3090 Gender and Environment F (3-0) [0.50]**

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.

*Prerequisite(s):* 7.50 credits, (GEOG\*2210 and GEOG\*2260 recommended)

*Department(s):* Department of Geography

**GEOG\*3110 Biotic and Natural Resources F (2-2) [0.50]**

This course focuses on the ecological basis for resource management, evaluates a number of current ecological theories and addresses their implications for resource management.

*Prerequisite(s):* (GEOG\*2460 or STAT\*2040), (1 of BIOL\*2060, BOT\*2050 , ENVB\*2030 , ENVS\*2030, GEOG\*2110)

*Department(s):* Department of Geography

**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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 7.50 credits including GEOG\*2210

*Department(s):* Department of Geography

**GEOG\*3320 Food Systems: Issues in Security and Sustainability F (3-0) [0.50]**

Many argue that current food systems are unsustainable and will be unable to provide adequate and appropriate nutrition for the global society in the 21st century. This course will explore this issue by taking a global and historic perspective to understand the structure and functioning of agriculture and food systems. We will pay particular attention to the interaction of farms with social, economic, institutional and environmental forces that combine to shape patterns of agricultural activity. In particular, we will explore ways of assessing the extent to which different kinds of food systems are "sustainable" as well as assess how resilient and robust these food systems are to environmental problems (such as climate change) and economic upheaval.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of Geography

**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\*2420

*Department(s):* Department of Geography

**GEOG\*3480 GIS and Spatial Analysis F,W (2-3) [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

*Department(s):* Department of Geography

**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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of Geography

**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

*Department(s):* Department of Geography

**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)

*Department(s):* Department of Geography

**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

*Department(s):* Department of Geography

**GEOG\*4150 Catchment 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

*Department(s):* Department of Geography

**GEOG\*4200 Social Life of Cities F (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

*Department(s):* Department of Geography

**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

*Department(s):* Department of Geography

**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

*Department(s):* Department of Geography

**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

*Department(s):* Department of Geography

**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

*Department(s):* Department of Geography

**GEOG\*4390 Seminar in Rural Geography W (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*

*Department(s): Department of Geography*

**GEOG\*4480 Applied Geomatics W (3-6) [1.00]**

This course adopts a project-oriented approach to the application of Geographic Information Systems (GIS) and remote sensing in spatial analysis. Students will have the opportunity to design and implement a research project using geomatics techniques to investigate a problem in any area of Geography.

*Prerequisite(s): GEOG\*3480*

*Department(s): Department of Geography*

**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.*

*Department(s): Department of Geography*

**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.*

*Department(s): Department of Geography*

**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.*

*Department(s): Department of Geography*

## 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]

This is a foundational 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.

*Offering(s):* Also offered through Distance Education format.

*Department(s):* School of Languages and Literatures

### GERM\*1110 Introductory German II 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

*Department(s):* School of Languages and Literatures

### GERM\*2010 Intermediate Language Practice F (2-0) [0.50]

This course provides further practice in the four skills and in the application of grammatical concepts.

*Co-requisite(s):* GERM\*2490

*Restriction(s):* GERM\*2500

*Department(s):* School of Languages and Literatures

### GERM\*2490 Intermediate German F (4-0) [0.50]

This course completes the introduction of grammatical concepts. It includes systematic oral and written practice and discussion of texts.

*Prerequisite(s):* 12U German or GERM\*1110

*Department(s):* School of Languages and Literatures

### GERM\*3000 Narratives of Migration F (2-0) [0.50]

This course provides a deeper focus and additional examples on the topic of HUMN\*3000 as relating to German-speaking countries. It also involves further oral and written practice in the German language. Texts will be read in German.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* GERM\*2490

*Co-requisite(s):* HUMN\*3000

*Department(s):* School of Languages and Literatures

### GERM\*3020 Myth and Fairy Tales in Germany W (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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* GERM\*2490 or 2.50 credits in GERM

*Co-requisite(s):* HUMN\*3020

*Restriction(s):* GERM\*3440 , HUMN\*3440

*Department(s):* School of Languages and Literatures

### GERM\*3150 Interactive German Language and Culture W (3-0) [0.50]

This course develops German language skills and cultural awareness. Discussions include such topics as Heimat, nation, migration, and study abroad. Students will engage with and reflect on different social and cultural perspectives through interviews, videos, and texts. Online interactions, including with people in and from Germany, form an integral part of the course.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* GERM\*2010 or 2.50 credits in GERM

*Restriction(s):* GERM\*3510 , GERM\*3540

*Department(s):* School of Languages and Literatures

### GERM\*3470 Holocaust & WWII in German Lit. & Film W (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

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* GERM\*2010 or 2.50 credits in GERM

*Co-requisite(s):* HUMN\*3470

*Department(s):* School of Languages and Literatures

### 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.

*Department(s):* School of Languages and Literatures

### GERM\*3700 Experiential Learning and Language S,F,W (0-0) [0.50]

This course provides an opportunity for independent study based on an experiential project in German. The project (approximately 70 hours) must be approved by a faculty member in the School of Languages and Literatures. It will include research about experiential learning, a reflective piece of writing and a public oral presentation about the project.

*Prerequisite(s):* 10.00 credits including 1.50 credits in German.

*Restriction(s):* A minimum cumulative average of 70% in all German course attempts. Instructor consent required.

*Department(s):* School of Languages and Literatures

### 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.

*Department(s):* School of Languages and Literatures

## 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 W (3-0) [0.50]**

This is a beginner course in Greek, providing the fundamentals of structure and idiom. (This course may not be taken by anyone who has 3U Greek).

*Department(s): School of Languages and Literatures*

#### **GREK\*1110 Preliminary Greek II F (3-0) [0.50]**

A continuation of GREK\*1100.

*Prerequisite(s): GREK\*1100 or 4U Greek*

*Department(s): School of Languages and Literatures*

#### **GREK\*2020 Greek Language and Culture W (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*

*Department(s): School of Languages and Literatures*

## 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 (H) are honours courses. Students in a general program wishing to take these must obtain the permission of instructors concerned.*

### HIST\*1010 Early Modern Europe S,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.

*Offering(s): Also offered through Distance Education format.*

*Department(s): Department of History*

### HIST\*1050 Invitation to History F,W (3-0) [0.50]

This course introduces students to the basics of the historian's craft, including interpreting primary sources, locating and critically analyzing secondary sources, and writing for history. For more detail on the content of sections consult the History department website. <https://www.uoguelph.ca/history>

*Restriction(s): This is a Priority Access Course. Enrolment may be restricted to particular programs and specializations during certain periods. Please see the departmental website for more information.*

*Department(s): Department of History*

### HIST\*1150 The Modern World F,W (3-0) [0.50]

This course is a survey of the twentieth century, focusing on major events and themes such as: the First and Second World Wars, the Great Depression, the rise and fall of fascism, social movements, revolutions, genocides, decolonization, nationalism, the Cold War, and the rise and decline of American power. The course draws its examples and case studies mainly from regions across the world, with the intention of broadening critical awareness and fostering global citizenship. (C)

*Department(s): Department of History*

### HIST\*1250 Science and Technology in a Global Context F,W (3-0) [0.50]

This course is an introduction to the culturally specific ways in which science and technology have developed historically from the ancient period through the twenty-first century. Emphasis will be placed on the patterns in which scientific knowledge and practices have traveled and been constructed across cultures and the interconnected but distinct histories of science and technology.

*Restriction(s): ASCI\*1000*

*Department(s): Department of History*

### 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.

*Prerequisite(s): 2.00 credits*

*Department(s): Department of History*

### 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.

*Prerequisite(s): 2.00 credits*

*Department(s): Department of History*

### 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.

*Offering(s): Also offered through Distance Education format.*

*Prerequisite(s): 2.00 credits*

*Department(s): Department of History*

### HIST\*2070 World Religions W (3-0) [0.50]

A wide-ranging look at the diverse religions of the world including Hinduism, Buddhism, Judaism, Christianity, and Islam. The course focuses on each faith's social context and interactions from their beginnings to the present day.

*Offering(s): Offered through Distance Education format only.*

*Prerequisite(s): 2.00 credits*

*Department(s): Department of History*

### HIST\*2090 Indigenous Peoples of the Americas W (3-0) [0.50]

This course covers selected events and issues in Indigenous history in the Americas, including topics such as origin narratives, self-governance, intertribal contact, transatlantic trade, treaty-making, stages of colonization, Indigenous rights and Indigenous protest movements. Themes may focus on specific regions of the Americas and may be examined through notable Indigenous figures, law and policy, technology, food, material culture, or moments of conflict.

*Prerequisite(s): 2.00 credits*

*Department(s): Department of History*

### HIST\*2100 Pre-Confederation Canada F (3-0) [0.50]

This course studies selected events and issues in pre-Confederation Canadian history including political, economic, social, and cultural developments.

*Prerequisite(s): 2.00 credits, including 0.50 credits in History at the 1000 level*

*Department(s): Department of History*

### HIST\*2120 Animals and Society W (3-0) [0.50]

This course provides a historical survey of modern human-animal relationships and the contradictions that characterize them. Topics may include: hunting and sporting, horses and 19th century cities, natural history and the zoo, history of veterinary medicine, 20th century animal sports, the birth of industrial animal agriculture, animals as biotechnology, anti-cruelty movements, petkeeping and consumerism, animal figures in popular culture. The thematic or geographic focus of the course may vary according to the expertise of the instructor.

*Offering(s): Also offered through Distance Education format.*

*Prerequisite(s): 2.00 credits*

*Department(s): Department of History*

### HIST\*2130 Modern Sport – A Global History F (3-0) [0.50]

Few activities lend themselves more powerfully to global histories of the modern world than sport. Since the mid-late nineteenth century, organized games have become integral parts of mass culture and everyday life around the world, reflecting and sometimes shaping much wider political and socio-economic processes. Encompassing key themes in the history of the modern world – such as race, empire, gender, mass media, and nationalism – this course critically analyzes the development of modern sport from a global perspective.

*Offering(s): Offered in even-numbered years.*

*Prerequisite(s): 2.00 credits*

*Department(s): Department of History*

### HIST\*2190 Celtic Ireland and Britain in the Early Middle Ages W (3-0) [0.50]

This course will explore the Celts of Ireland and Britain from the time of the druids to the post-millennium emergence of literature relating to a king called Arthur. Reflecting on what we know of the Celts, how we know it, and what the term means, the course will examine topics such as the development of kingdoms and elite 'heroic' culture, the spread of Christianity, the law, everyday life and the family, art and literature, and the interaction between the Celts and their neighbours.

*Prerequisite(s): 2.00 credits*

*Department(s): Department of History*

### 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.

*Prerequisite(s): 2.00 credits*

*Department(s): Department of History*

**HIST\*2220 Buying and Selling: Consumer Cultures S (3-0) [0.50]**

This course explores how the things we buy shape our personal identities and how individuals relate to corporations and advertisers, in the context of the emergence of modern consumer society from the 18th century to the present. It critically examines the shift from home-production economies to mass production. Examining how developments such as department stores, product branding, modern advertising, urbanization, and suburbanization have shaped society, politics, and the economy, the course provides a historical context for contemporary debates about consumer culture.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 2.00 credits

*Department(s):* Department of History

**HIST\*2240 Women, War and Nation F (3-0) [0.50]**

This course is a survey of the inter-connected nature of gender constructs, nation-states and violence in history, primarily focused on the nineteenth and twentieth centuries. The course proceeds in a roughly chronological order, examining individuals, nations, revolutions, and wars across the globe. We engage in individual and comparative studies to question the gendered origins and effects of nationalism and violence in history – and their continuing relevance.

*Prerequisite(s):* 2.00 credits

*Department(s):* Department of History

**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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 2.00 credits

*Department(s):* Department of History

**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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 2.00 credits

*Department(s):* Department of History

**HIST\*2280 Hockey in Canadian History S (3-0) [0.50]**

Hockey provides a valuable prism through which major cultural, socio-economic and even political developments within Canada can be reflected. This course reviews the considerable role that hockey has played in Canada's post-Confederation history. From the late nineteenth century and throughout the twentieth century, hockey has helped to inform the nation's sense of self and has also reflected prevailing social attitudes and cultural values within Canada.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 2.00 credits

*Department(s):* Department of History

**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.

*Prerequisite(s):* 2.00 credits

*Restriction(s):* HIST\*2150 , HIST\*2650

*Department(s):* Department of History

**HIST\*2340 Slavery and Migrations in the Atlantic World, 1500-1850 W (3-0) [0.50]**

The course will deal with the forced migration of Africans resulting from the Atlantic slave trade and the indentured labor migration of Indians to the Caribbean Isles, the latter which was associated with the demise of the slave trade and slavery. Issues to examine will include a comparison of forces internal and external to Africa and India productive of the exodus, the nature of diaspora communities established by the both set of migrants, and the socio-political and economic dynamics involved in their establishment as citizens of their new societies during the period.

*Prerequisite(s):* 2.00 credits

*Department(s):* Department of History

**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.

*Prerequisite(s):* 2.00 credits, including 0.50 credits in History at the 1000 level

*Department(s):* Department of History

**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.

*Prerequisite(s):* 2.00 credits

*Department(s):* Department of History

**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.

*Prerequisite(s):* 2.00 credits

*Department(s):* Department of History

**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.

*Prerequisite(s):* 2.00 credits, including 0.50 credits in History at the 1000 level

*Department(s):* Department of History

**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.

*Prerequisite(s):* 2.00 credits

*Department(s):* Department of History

**HIST\*2850 Ancient Greece and Rome W (3-0) [0.50]**

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.

*Prerequisite(s):* 2.00 credits

*Department(s):* Department of History

**HIST\*2890 Early Islamic World F (3-0) [0.50]**

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.

*Prerequisite(s):* 2.00 credits

*Department(s):* Department of History

**HIST\*2910 Modern Asia W (3-0) [0.50]**

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.

*Prerequisite(s):* 2.00 credits

*Department(s):* Department of History

**HIST\*2920 Republican Latin America W (3-0) [0.50]**

This course will study selected themes in the history of Latin American republics from the independence period to the modern era.

*Prerequisite(s):* 2.00 credits

*Department(s):* Department of History

**HIST\*2930 Women and Cultural Change F (3-0) [0.50]**

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.

*Prerequisite(s):* 2.00 credits

*Department(s):* Department of History

**HIST\*3020 Sexuality and Gender in History U (3-0) [0.50]**

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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 7.50 credits including 1.00 credits in History

*Department(s):* Department of History

**HIST\*3070 Modern India W (3-0) [0.50]**

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.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of History

**HIST\*3080 United States in the World F (3-0) [0.50]**

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.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of History

**HIST\*3130 Popular Culture and Punishment, 1700-1900 F (3-0) [0.50]**

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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 7.50 credits including (HIST\*1010 or SOC\*1500)

*Department(s):* Department of History

**HIST\*3140 Witch-hunts and Popular Culture S (3-0) [0.50]**

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 addition to placing the witch-hunts in their historical context by providing students with the background to Scotland's political, religious, and social history in the early modern period, the course will introduce students to the considerable body of historical writing on the subject of the witch-hunts and give them hands on experience with primary source documents in order to discuss specific witch trials themselves. Popular and elite conceptions of witchcraft will be explored, as well as gender history.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 7.50 credits including 1.00 credits in History

*Department(s):* Department of History

**HIST\*3150 History and Culture of Mexico U (3-0) [0.50]**

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.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of History

**HIST\*3160 Canadian Political History U (3-0) [0.50]**

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.

*Prerequisite(s):* 7.50 credits including (1 of HIST\*2100, HIST\*2600 or HIST\*2601/2, POLS\*1400, POLS\*2300)

*Department(s):* Department of History

**HIST\*3180 Canada Since 1945 U (3-0) [0.50]**

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.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of History

**HIST\*3200 Youth in History F (3-0) [0.50]**

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.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of History

**HIST\*3230 Spain and Portugal, 1085 to 1668 F (3-0) [0.50]**

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.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of History

**HIST\*3240 Food History F (3-0) [0.50]**

This course will examine the history of food and foodways from the early 19th century to the present. It will explore the impact of changing agricultural practices and the growth of the food processing industry, including the rise of nutritional science, and the impact on eating patterns.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of History

**HIST\*3260 Cinema and the Moving Image F (3-0) [0.50]**

This course provides a historical survey of cinema and the moving image, as well as the material, cultural, political and technological contexts of their production. Students will come to understand the broad development of the medium over the past one hundred and thirty years, beginning with early, pre-cinematic moving image technologies and ending with an analysis of the influence of other media and merchandizing on cinema. Students will also become familiar with crucial terminology for analyzing and writing about how films have been constructed and how they communicated to audiences over time. Geographic or thematic focus may vary according to the expertise of the instructor.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of History

**HIST\*3270 Revolution in the Modern World W (3-0) [0.50]**

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.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of History

**HIST\*3310 Disease and History U (2-0) [0.50]**

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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of History

**HIST\*3320 Modern China F (3-0) [0.50]**

This course examines the history and culture of China since the nineteenth century. Topics may include economics, gender, imperialism, militarism, politics, and religion.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of History

**HIST\*3330 The Scottish Diaspora W (3-0) [0.50]**

The course offers a comprehensive overview of Scottish Diaspora history, focusing on a broad range of themes and settlement locations. Covering the period c.1750 to 1945, the historical geographies of the Scottish Diaspora explored include the 'near Diaspora' of England, Wales and Ireland; Continental Europe; the traditional settler Dominions; the United States; Africa; and Asia.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of History

**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 .

*Department(s):* Department of History

**HIST\*3360 History and Culture of Brazil W (3-0) [0.50]**

This course will cover the history and culture of Brazil from its early indigenous civilizations to the present. Topics may include: European discovery and contact, the colonial era, slave trade and slavery, Dutch occupation, hybrid Afro-Christian religions, the Inquisition, independence, abolitionism, samba and carnival, dictatorships, soccer, favelas, and issues related to race, class, gender and the environment.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of History

**HIST\*3370 Canada and the First World War S,F,W (3-0) [0.50]**

This course examines Canada's role in the First World War. The question of how much the war was a transformative experience for Canadians will be central to students' learning, as they grapple with issues pertaining to race, ethnicity, class, gender, militarism, pacifism, religion, age, and memory.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of History

**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

*Department(s):* Department of History

**HIST\*3390 Governments and Indigenous Spaces F (3-0) [0.50]**

This course examines how colonial and neo-colonial governments interacted with Indigenous societies by restricting social, economic, and cultural activities. It will explore the day-to-day impacts of colonial and neo-colonial governments on Indigenous spaces. Engagement with case studies will deepen student understanding of both bureaucratic violence and Indigenous survivance.

*Prerequisite(s):* 7.50 credits including 1.000 credits in History

*Department(s):* Department of History

**HIST\*3410 Religion in 19th-Century Africa F (3-0) [0.50]**

This course will introduce students to the dynamic 19th-century religious landscape of Africa before European colonization, examining the role of Islam and Christianity in the social organization and political transformation of African societies. It will examine how both these religions (in Sudanic, North and Northeast Africa on the one hand) and indigenous religions (in much of southern Africa on the other) intermediated and coloured the character of the encounter between African societies and European colonizers. Attention will be given to the nature and impact of the Islamic revolutions that broke out across much of Sudanic and Northeast Africa during this period and the intersection between indigenous African religions, missionary Christianity, and the socio-political transformations that swept across much of coastal West and southern Africa.

*Prerequisite(s):* 7.50 credits including (1 of HIST\*1150, HIST\*2340, HIST\*2960 )

*Department(s):* Department of History

**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

*Department(s):* Department of History

**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

*Department(s):* Department of History

**HIST\*3460 Natural Disasters in Global History W (3-0) [0.50]**

The history of natural disasters offers insights into how the relationships between human societies and their natural environments have changed over time. Through a series of case studies, the course will trace the evolving history of natural disasters in global context from the late medieval period to the present. The course will address thematic issues including the construction of vulnerable landscapes and societies; the short-term impacts of disasters; changing patterns of disaster relief; and disasters and social change.

*Prerequisite(s):* 7.50 credits

*Restriction(s):* HIST\*3430

*Department(s):* Department of History

**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.

*Department(s):* Department of History

**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.

*Department(s):* Department of History

**HIST\*3520 The Vikings: Early Medieval Encounters W (3-0) [0.50]**

This course explores the topic of the Vikings in early medieval culture (700 - 1100). The focus will include the role of violence in early medieval society, the construction of the 'Other', as well as medieval and modern historiography. It provides students with enhanced knowledge of early medieval Europe, the Byzantine Empire and Russia.

*Prerequisite(s):* 7.50 credits including (HIST\*2000 or HIST\*2200)

*Department(s):* Department of History

**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.

*Offering(s):* 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)

*Department(s):* Department of History

**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)

*Department(s):* Department of History

**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)

*Department(s):* Department of History

**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

*Department(s):* Department of History

**HIST\*3600 Quebec and French Canada U (3-0) [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 POLS\*2300)

*Department(s):* Department of History

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of History

**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 )

*Department(s):* Department of History

**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

*Department(s):* Department of History

**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

*Department(s):* Department of History

**HIST\*3820 Early Modern France U (3-0) [0.50]**

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.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of History

**HIST\*3830 Modern Middle East W (3-0) [0.50]**

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.

*Prerequisite(s):* 7.50 credits including (1 of HIST\*2890, HIST\*3840, POLS\*3060)

*Department(s):* Department of History

**HIST\*3840 Ottoman Empire, 1300-1923 W (3-0) [0.50]**

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.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of History

**HIST\*3910 Religion in Africa Since 1900 W (3-0) [0.50]**

This course will examine the intersection of Islam, Christianity, and the colonial and post-colonial experience of Africans and how these religions helped to determine the opportunities for and limits of colonial impact and anti-colonial nationalist activities. It will also examine the role of Islam in North Africa and of Christianity (and to a limited extent of Islam) in much of sub-Saharan Africa in the emergence of a new class of elite through whose leadership modern African nation states emerged after independence. Finally, it will examine the increasingly globalized characteristics of these religions and the pivotal role they have played in the emerging socio-political realities of late 20th and early 21st century Africa.

*Prerequisite(s):* 7.50 credits including (HIST\*1150 or HIST\*2340)

*Department(s):* Department of History

**HIST\*4030 Historical Biography U (3-0) [1.00]**

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)

*Prerequisite(s):* 10.00 credits including 1.50 credits in History at the 3000-level

*Restriction(s):* Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.

*Department(s):* Department of History

**HIST\*4040 Topics in Scottish History U (3-0) [1.00]**

This is 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)

*Prerequisite(s):* 10.00 credits including 1.50 credits in History at the 3000-level

*Restriction(s):* Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.

*Department(s):* Department of History

**HIST\*4090 Modern European History U (3-0) [1.00]**

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)

*Prerequisite(s):* 10.00 credits including (1 of HIST\*1150, HIST\*2510, HIST\*3090 )

*Restriction(s):* Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.

*Department(s):* Department of History

**HIST\*4100 Africa and the Slave Trades U (3-0) [1.00]**

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)

*Prerequisite(s):* 10.00 credits including (1 of HIST\*2340, HIST\*2960 , HIST\*3410, HIST\*3910)

*Restriction(s):* Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.

*Department(s):* Department of History

**HIST\*4120 Topics in Global History U (3-0) [1.00]**

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)

*Prerequisite(s):* 10.00 credits including 1.50 credits in History at the 3000-level

*Restriction(s):* Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.

*Department(s):* Department of History

**HIST\*4140 Sexuality in the Middle Ages F (3-0) [1.00]**

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. (H)

*Prerequisite(s):* 10.00 credits including (1 of HIST\*2000, HIST\*2200, HIST\*3020)

*Restriction(s):* Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.

*Department(s):* Department of History

**HIST\*4160 Seminar in Canadian Political History U (3-0) [1.00]**

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)

*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.

*Department(s):* Department of History

**HIST\*4170 Exploration of Digital Humanities W (3-0) [1.00]**

This course is designed to introduce students to applications of new and inter-disciplinary digital humanities approaches, methodologies and tools, and to explore their application to text, image, sound, map, and other media sources. It will appeal to students in literature, history, fine arts, and music who want an introduction to state-of-the-art digital humanities research. There will be flexibility to accommodate the specific disciplines and interests of the students. (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.

*Department(s):* Department of History

**HIST\*4180 American Identities F (3-0) [1.00]**

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)

*Prerequisite(s):* 10.00 credits including (HIST\*2300 or HIST\*2650 )

*Restriction(s):* HIST\*4210 . Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.

*Department(s):* Department of History

**HIST\*4200 Health, Mind and Body F (3-0) [1.00]**

This is a seminar course which will explore the history of health, the body and the mind. Possible topics include: the history of athletics and physical fitness, the history of disability, the history of nutritional science and advice, the history of women's health, the history of disease, the history of mental illness, and the history of psychiatry. (H)

*Prerequisite(s):* 10.00 credits, including 1.50 credits in History at the 3000-level

*Restriction(s):* Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.

*Department(s):* Department of History

**HIST\*4220 Cities and Canadian Culture U (3-0) [1.00]**

Reflecting the fact that Canada's population has been predominantly urban for a century, this seminar explores the role of urban centres in shaping Canadian cultural identity. Particular focus will be placed on the ways that city living and city form have affected the expression of Canadian identity through such topics as spectator sports, uses of public spaces, and metropolitan control of print and broadcast media (H)

*Prerequisite(s):* 10.00 credits including (HIST\*2600 or HIST\*2601/2 )

*Restriction(s):* HIST\*3220 . Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.

*Department(s):* Department of History

**HIST\*4270 Topics in Modern Asia W (3-0) [1.00]**

This course will examine select topics in the development of Asian countries from the 18th to the 21st Century. Select themes including imperialism, nationalism, economics, society, and gender will be examined in a variety of Asian countries. (H)

*Prerequisite(s):* 10.00 credits including HIST\*2910.

*Restriction(s):* HIST\*4900

*Department(s):* Department of History

**HIST\*4280 Poverty and Policy in the Victorian Age U (3-0) [1.00]**

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)

*Prerequisite(s):* 10.00 credits including HIST\*2500.

*Restriction(s):* Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.

*Department(s):* Department of History

**HIST\*4450 Life, Death and Migrations F (3-0) [1.00]**

This seminar uses quantitative sources and methods to explore such themes as social inequality and demographic experience since 1800. It examines the value of such data for policy purposes, as well as the social and cultural contexts in which surveys are developed and undertaken. Students develop presentational and analytical skills through research projects. (H)

*Prerequisite(s):* 10.00 credits including HIST\*2450, and at least 1.00 credits in History at the 3000 level or above.

*Restriction(s):* Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.

*Department(s):* Department of History

**HIST\*4470 Special History Project Seminar I U (3-0) [0.50]**

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)

*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.

*Department(s):* Department of History

**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.

*Department(s):* Department of History

**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.

*Department(s):* Department of History

**HIST\*4700 Topics in Medieval History U (3-0) [1.00]**

This course provides a detailed analysis of selected aspects of the Middle Ages from c. 1000 through the early modern period. 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.

*Department(s):* Department of History

**HIST\*4820 Images, Conflict and Politics in the Middle East F (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. (H)

*Prerequisite(s):* 10.00 credits, (1 of HIST\*2890, HIST\*3830, HIST\*3840, POLS\*3060)

*Restriction(s):* Restricted to students in the B.A. Honours program with a minimum of 70% average in all History course attempts.

*Department(s):* Department of History

**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.

*Department(s):* Department of History

## 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.

*Offering(s):* Offered through Distance Education format only.

*Restriction(s):* HORT\*3430. Not acceptable for students in the BSC, BSC(Agr) or BSC(Env) programs.

*Department(s):* Department of Plant Agriculture

### **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 BSC, BSC(Agr) or BSC(Env) programs.

*Department(s):* Department of Plant Agriculture

### **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, (1 of BIOL\*1050, BIOL\*1070, BIOL\*1080)]

*Restriction(s):* HORT\*3220

*Department(s):* Department of Plant Agriculture

### **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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 1 of AGR\*2470, LARC\*2240, 0.50 credits in botany

*Department(s):* Department of Plant Agriculture

### **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

*Department(s):* Department of Plant Agriculture

### **HORT\*3150 Principles and Applications of Plant Propagation F (2-2) [0.50]**

Plant propagation is the art and science of multiplication of plant material involving the application of the principles of plant growth and development and the techniques of mass production. This course will explore biological, commercial, environmental, and social dimensions of plant propagation systems with emphasis on global trends in the plant production industry.

*Prerequisite(s):* AGR\*2470 or BOT\*2100

*Restriction(s):* HORT\*3230 , HORT\*3350

*Department(s):* Department of Plant Agriculture

### **HORT\*3270 Medicinal Plants W (3-0) [0.50]**

This course will focus on the application of recent biotechnology advances to elucidate the physiology, biochemistry, and conservation biology of medicinal plants for enhancing their efficacy in preventing and curing human disease.

*Prerequisite(s):* 1 of BIOL\*1050, BIOL\*1070, BIOL\*1080, BIOL\*1090

*Department(s):* Department of Plant Agriculture

### **HORT\*3280 Greenhouse Production W (3-3) [0.50]**

This course examines the principles and practices of production, culture and marketing of greenhouse flower and vegetable crops.

*Prerequisite(s):* 1 of AGR\*2050, AGR\*2470, BOT\*2100

*Department(s):* Department of Plant Agriculture

### **HORT\*3310 Plants, Food and Health F (3-0) [0.50]**

This course will provide an in-depth understanding of plants grown for food, spices and grains as they relate to humans in terms of disease prevention and health. Plants and their familial characteristics, the metabolic pathways characteristic to specific food types, and their effects on human physiology will be discussed. The topic will be introduced in the context of world food habits, plants as food and hot spots of healthy populations and their food customs.

*Prerequisite(s):* BIOC\*2580

*Department(s):* Department of Plant Agriculture

### **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 studied in detail, especially as it pertains to cool climate and northern limit grape growing for premium wine quality. End product management and wine regions of the world will be examined.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* AGR\*2470 or BOT\*2100

*Department(s):* Department of Plant Agriculture

### **HORT\*3510 Vegetable Production F (3-3) [0.50]**

The principles of vegetable production will be studied in terms of sustainable crop management and the impact of biotic and abiotic factors will be discussed. Consideration will also be given to storage processing and marketing.

*Prerequisite(s):* 1 of AGR\*2050, AGR\*2470, BOT\*2100

*Department(s):* Department of Plant Agriculture

### **HORT\*4200 Plants, the Environment and Society W (3-0) [0.50]**

The course will explore the environmental impact of plants 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 managed landscapes and issues surrounding society's perception of management practices. The impact of public perception about the management and environmental impact of plants in urban and rural landscapes will be discussed, including the issues surrounding the use and maintenance of managed landscapes ecosystems.

*Prerequisite(s):* (1 of AGR\*2470, BOT\*2100, ENVS\*2330, LARC\*2240)

*Department(s):* Department of Plant Agriculture

### **HORT\*4300 Postharvest Physiology W (3-3) [0.50]**

This course provides 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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* AGR\*2470

*Department(s):* Department of Plant Agriculture

### **HORT\*4380 Tropical and Sub-Tropical Crops F (3-0) [0.50]**

This course examines the production and utilization of tropical and sub-tropical crops in farming systems.

*Prerequisite(s):* 1 of AGR\*2470, BOT\*2100, (AGR\*2050, AGR\*2150)

*Department(s):* Department of Plant Agriculture

### **HORT\*4420 Fruit Crops F (3-3) [0.50]**

Growth patterns, fruiting characteristics and adaptation to environmental conditions of fruit crops in temperate regions will be presented. Classification, cultural practices including propagation and the physiological principles underlying these practices will be emphasized.

*Prerequisite(s):* 1 of AGR\*2050, AGR\*2470, BOT\*2100

*Department(s):* Department of Plant Agriculture

**HORT\*4450 Advanced Turfgrass Science W (3-2) [0.50]**

This course emphasizes 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): AGR\*2050 or AGR\*2470*

*Department(s): Department of Plant Agriculture*

# Hospitality and Tourism Management

*School of Hospitality, Food and Tourism Management.*

## HTM\*1070 Responsible Tourism Policy and Planning F (3-0) [0.50]

This course focuses on the various aspects of tourism policy, planning and development with a heavy emphasis on responsible choices. Tourism is reviewed in a global context and its role, both positive and negative, in socio-economic development, poverty alleviation, climate change, and other topics of current importance are explored.

*Restriction(s):* HTM\*2170 This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the department for more information.

*Department(s):* School of Hospitality, Food and Tourism Management

## HTM\*1160 Lodging Operations W (3-0) [0.50]

This course introduces the lodging industry with the inclusion of terminology, organizational structures, and departmental responsibilities. The current global structure of the lodging environment including an analysis of major organizations and forecasts, the future of lodging with a reliance on a critical analysis of existing studies, consulting reports, and up-to-date lodging news is covered. Decision-making from the role of a lodging manager is investigated with a focus on safety, security, profitability, and ethical management.

*Restriction(s):* HTM\*2100 This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the department for more information.

*Department(s):* School of Hospitality, Food and Tourism Management

## HTM\*1700 Foodservice Management F (3-0) [0.50]

This course introduces students to the many facets of the foodservice industry in Canada. Emphasis will be placed on three areas of study; the foodservice industry and organizations, how foodservice relates to greater food systems and how issues in these areas effect the industry.

*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 department for more information.

*Department(s):* School of Hospitality, Food and Tourism Management

## 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):* 4.00 credits

*Restriction(s):* Restricted to students in BCOMM.HAFA, BCOMM.HAFA:C, BCOMM.HTM, BCOMM.HTM:C or BCOMM.TMGT.

*Department(s):* School of Hospitality, Food and Tourism Management

## 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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 4.00 credits

*Restriction(s):* Restricted to students in BCOMM.HAFA, BCOMM.HAFA:C, BCOMM.HTM, BCOMM.HTM:C, BCOMM.TMGT or BASC.AHN

*Department(s):* School of Hospitality, Food and Tourism Management

## HTM\*2070 Event Management W (3-0) [0.50]

This course takes a holistic approach to the sales, servicing and management of the meetings, events, conventions, exhibitions, and incentive travel 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 a significant sector of the tourism and hospitality industry.

*Prerequisite(s):* 1 of HTM\*1000 , HTM\*1160, HTM\*1700

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

*Department(s):* School of Hospitality, Food and Tourism Management

## HTM\*2700 Understanding Foods F,W (3-2) [0.50]

This course explores the chemistry behind food preparation, food safety and handling; and the impact of different cooking methods on the colour, flavour and texture of food. Students will apply knowledge by cooking and assessing a series of prepared products.

*Restriction(s):* Restricted to students in BCOMM.HAFA, BCOMM.HAFA:C, BCOMM.HTM, BCOMM.HTM:C, BCOMM.TMGT or BASC.AHN

*Department(s):* School of Hospitality, Food and Tourism Management

## HTM\*2740 Cultural Aspects of Food F (3-0) [0.50]

Students are provided with an opportunity to learn about numerous cultural factors that influence food selection, preparation, and consumption patterns. Food history, religions, geographic location and culture are studied to develop an understanding of the impact of these factors on food related behaviours.

*Prerequisite(s):* 2.00 credits

*Department(s):* School of Hospitality, Food and Tourism Management

## HTM\*3030 Beverage Management F (2-2) [0.50]

Students will examine the beverage industry, including bottled water, energy drinks, coffee, tea and alcoholic beverages. In addition to the laws regulating production, labelling and marketing of these products, the course discusses the active components of beverages and their impact on the human body, consumption risks and recommended uses.

*Prerequisite(s):* 9.00 credits

*Restriction(s):* Students must be of legal drinking age in Ontario. This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations. See department for more information.

*Department(s):* School of Hospitality, Food and Tourism Management

## HTM\*3060 Lodging Management F (3-0) [0.50]

This course explores the principles and practices of lodging management and related 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. The focus of the course is on communication both within and among departments, divisions, and with the consumer.

*Prerequisite(s):* 9.00 credits including HTM\*2010, (HTM\*1160 or HTM\*2100 )

*Department(s):* School of Hospitality, Food and Tourism Management

## HTM\*3080 Marketing Strategy for Hospitality Managers 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 through creating value for, and establishing strong relationships with their customers. Course content covers key elements of strategic marketing including, segmentation and target marketing, positioning and branding, pricing, promotions, personal selling, and distribution system decisions within the context of the hospitality and tourism industry.

*Prerequisite(s):* 9.00 credits including HTM\*2010, MCS\*1000

*Department(s):* School of Hospitality, Food and Tourism Management

## HTM\*3090 Restaurant Operations Management F,W (2-4) [1.00]

This course covers the application of managerial functions to restaurant and foodservice operations with the emphasis on teamwork and the principles of food production and service in a sustainable commercial restaurant setting. Students gain hands-on understanding of scheduling, purchasing, costing, nutritional analysis, and food safety while operating a student run restaurant.

*Prerequisite(s):* HTM\*2030, (HTM\*1700 or HTM\*2700)

*Department(s):* School of Hospitality, Food and Tourism Management

## HTM\*3120 Service Operations Analysis F,W (3-0) [0.50]

This course presents an overview of strategic analysis of operations management in service industries. Tools and concepts are introduced for planning and evaluating initiatives to support service design, productivity and delivery. Topics include layout, location, productivity, service design and yield management while further developing spreadsheet skills in analytical contexts.

*Prerequisite(s):* (ACCT\*1220 or ACCT\*2220 ), (1 of ECON\*2740, PSYC\*1010, STAT\*2040, STAT\*2060, STAT\*2080)

*Restriction(s):* FARE\*3310. Restricted to students in BCOMM.HAFA, BCOMM.HAFA:C, BCOMM.HTM, BCOMM.HTM:C or BCOMM.TMGT.

*Department(s):* School of Hospitality, Food and Tourism Management

**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\*1070 or HTM\*2170

*Restriction(s):* Restricted to students in BCOMM.HAFA, BCOMM.HAFA:C, BCOMM.HTM, BCOMM.HTM:C, BCOMM.TMGT, or BA.EURS Area of Emphasis in European Business.

*Department(s):* School of Hospitality, Food and Tourism Management

**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.

*Offering(s):* Offered through Distance Education format only. Offered in even-numbered years.

*Prerequisite(s):* (1 of BUS\*2090 , HROB\*2090, HROB\*2100 , ACCT\*2230)

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information. Students must be legal age of 19 or over.

*Department(s):* School of Hospitality, Food and Tourism Management

**HTM\*3780 Managing Food in Canada F (3-0) [0.50]**

This course provides an introduction to the Canadian food system. The subjects of global trade, supply chain management, food legislation and regulation, food safety, consumer food-related behaviour, and food product development are studied to develop an understanding of how they impact the Canadian food system and its functionality.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 1 of FOOD\*2010, HTM\*1700, HTM\*2700

*Restriction(s):* AGR\*1110 FARE\*1400

*Department(s):* School of Hospitality, Food and Tourism Management

**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):* This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information. Students must be of legal drinking age in Ontario.

*Department(s):* School of Hospitality, Food and Tourism Management

**HTM\*4060 Advanced Lodging Management W (3-0) [0.50]**

This course integrates knowledge and skills in lodging operation, restaurant management, marketing and sales, managerial accounting and finance, revenue management and human resources management. Students will formulate and implement strategic business plans and budgets and evaluate business performance utilizing a hotel simulation program. This course particularly emphasizes development of analytical decision-making and problem solving skills.

*Prerequisite(s):* HTM\*3060

*Department(s):* School of Hospitality, Food and Tourism Management

**HTM\*4080 Experiential Learning and Leadership in the Hospitality and Tourism Industry F,W (3-0) [0.50]**

An integration of the students' academic studies with their work experiences. Emphasis will be placed on applying and evaluating theoretical concepts in different working environments. Students will investigate the concept of workplace fit applying this to their prospective career path.

*Prerequisite(s):* 14.00 credits and a minimum of 700 hours of verified work experience in the hospitality and tourism industry.

*Restriction(s):* HTM\*3150 , Restricted to students in BCOMM:HAFA, BCOMM:HAFA:C. BCOMM:HTM, BCOMM:HTM:C or BCOMM:TMGT. Instructor Consent Required.

*Department(s):* School of Hospitality, Food and Tourism Management

**HTM\*4090 Hospitality Development, Design and Sustainability F (3-0) [0.50]**

This course focuses on the development, design and management of the hospitality built environment. It explores issues related to the planning and development of hospitality properties, provides an introduction to property and asset management as related to the hospitality industry, and examines universal design as applied to the 'servicescape', all within the broad context of sustainability.

*Prerequisite(s):* 14.00 credits including HTM\*1000 or HTM\*1160

*Restriction(s):* REAL\*3890

*Department(s):* School of Hospitality, Food and Tourism Management

**HTM\*4110 Advanced Food Service Operations W (1-7) [0.50]**

This course focuses on the management and operation of food service events. Emphasis is placed on event planning and creativity in menu formulation, operational performance, and guest satisfaction. This includes ambience, total service and the dynamic relationship between service and the product of food and beverages.

*Prerequisite(s):* HTM\*3090

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* School of Hospitality, Food and Tourism Management

**HTM\*4130 Current Management Topics U (3-0) [0.50]**

Operating problems in the hospitality and tourism industry are analyzed and discussed using actual case studies. Students should check with the School of Hospitality, Food and Tourism Management to determine what topic will be offered during specific semesters, and which prerequisites, if any, are appropriate.

*Restriction(s):* Instructor consent required.

*Department(s):* School of Hospitality, Food and Tourism Management

**HTM\*4140 Current Management Topics U (3-0) [0.50]**

Operating problems in the hospitality and tourism industry are analyzed and discussed. Students should check with the School of Hospitality, Food and Tourism Management to determine what topic will be offered during specific semesters, and which prerequisites, if any, are appropriate.

*Restriction(s):* Instructor consent required.

*Department(s):* School of Hospitality, Food and Tourism Management

**HTM\*4150 Current Management Topics U (3-0) [0.50]**

Operating problems in the hospitality and tourism industry are analyzed and discussed. Students should check with the School of Hospitality, Food and Tourism Management to determine what topic will be offered during specific semesters, and which prerequisites, if any, are appropriate.

*Restriction(s):* Instructor consent required.

*Department(s):* School of Hospitality, Food and Tourism Management

**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

*Department(s):* School of Hospitality, Food and Tourism Management

**HTM\*4190 Hospitality and Tourism Industry Consultation F,W (3-0) [0.50]**

This is a project-based course that requires students to take a 'systems-thinking' approach to studying current business problems faced by hospitality and tourism organizations. Students are asked to identify issues, determine context, and use evidence-based research and analysis to provide alternative courses of action and recommendations for actual hospitality businesses.

*Prerequisite(s):* 14.00 credits including ACCT\*2230, HTM\*3080

*Restriction(s):* Restricted to students in BCOMM:HAFA, BCOMM:HAFA:C, BCOMM:HTM, BCOMM:HTM:C or BCOMM:TMGT.

*Department(s):* School of Hospitality, Food and Tourism Management

**HTM\*4250 Hospitality Revenue Management F,W (3-0) [0.50]**

This course is an advanced exploration of revenue management concepts, tools and application. The objective of the course is to provide a solid foundation in revenue management for careers in tourism, services, and hospitality management.

*Prerequisite(s):* FARE\*3310 or HTM\*3120

*Department(s):* School of Hospitality, Food and Tourism Management

**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):* Instructor consent required.

*Department(s):* School of Hospitality, Food and Tourism Management

## Human Resources and Organizational Behaviour

*Department of Management- College of Business 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.

*Offering(s):* Also offered through Distance Education format.

*Equate(s):* BUS\*2010

*Restriction(s):* UNIV\*2000

*Department(s):* Department of Management

### HROB\*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.)

*Equate(s):* BUS\*2090

*Restriction(s):* HROB\*2100 , HROB\*4000, PSYC\*3080

*Department(s):* Department of Management

### HROB\*2290 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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 1 of BUS\*2090 , BUS\*2220 , HROB\*2090

*Restriction(s):* BUS\*3000 , HROB\*2100 , HROB\*3000 , PSYC\*3070 This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Management

### HROB\*3010 Managing and Rewarding Performance F (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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 1 of BUS\*3000 , HROB\*2100 , HROB\*2290, HROB\*3000 , PSYC\*3070

*Equate(s):* BUS\*3010 , PSYC\*3010

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Management

### HROB\*3030 Workplace Health and Safety 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.

*Prerequisite(s):* 9.00 credits including (1 of BUS\*3000 , HROB\*2100 , HROB\*2290, HROB\*3000 , PSYC\*3070 )

*Equate(s):* BUS\*3030 , PSYC\*3060

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Management

### 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.

*Prerequisite(s):* 9.00 credits including (1 of BUS\*3000 , HROB\*2100 , HROB\*2290, HROB\*3000 , PSYC\*3070 )

*Restriction(s):* Restricted to students in BCOMM, BASC: AHN, and BA: EURS.

*Department(s):* Department of Management

### HROB\*3070 Attracting and Acquiring Talent F (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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 1 of BUS\*3000 , HROB\*2100 , HROB\*2290, HROB\*3000 , PSYC\*3070

*Equate(s):* BUS\*3070

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Management

### HROB\*3090 Developing Talent 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.

*Prerequisite(s):* 1 of BUS\*3000 , HROB\*2100 , HROB\*2290, HROB\*3000 , PSYC\*3070

*Equate(s):* BUS\*3090 , PSYC\*3090

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Management

### HROB\*3100 Developing Management and Leadership Competencies 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.

*Prerequisite(s):* 9.00 credits including (1 of BUS\*3000 , HROB\*2100 , HROB\*2290, HROB\*3000 , PSYC\*3070 )

*Restriction(s):* BUS\*4000 , HTM\*4100

*Department(s):* Department of Management

### HROB\*4000 Leadership and Organizational Management Capstone W (3-0) [0.50]

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.

*Prerequisite(s):* HROB\*4100

*Department(s):* Department of Management

### HROB\*4010 Leadership Certificate 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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* ( BUS\*2010 or HROB\*2010 ) plus 120 hours of placement experience

*Equate(s):* BUS\*4010 , UNIV\*4000

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Management

### HROB\*4030 Advanced Topics In Leadership and Organizational 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):* 12.50 credits including (1 of BUS\*3000 , HROB\*2100 , HROB\*2290, HROB\*3000 , PSYC\*3070 )

*Equate(s):* BUS\*4030

*Department(s):* Department of Management

**HROB\*4060 Workforce Optimization 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 , HROB\*2290, HROB\*3000 , PSYC\*3070 )

*Equate(s):* BUS\*4060 , HTM\*4160

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Management

**HROB\*4100 Evidence-Based People 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):* 12.50 credits including (1 of BUS\*3000 , HROB\*2100 , HROB\*2290, HROB\*3000 , PSYC\*3070 )

*Equate(s):* BUS\*4100 , PSYC\*4100

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Management

## Human Kinetics

Department of Human Health and Nutritional Sciences

### HK\*2270 Principles of Human Biomechanics F (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/moment as they apply to the description of motion, injury of musculoskeletal tissues and optimization of human performance.

*Prerequisite(s):* 4.00 credits including BIOL\*1090, ( PHYS\*1000 or PHYS\*1080)

*Department(s):* Department of Human Health and Nutritional Sciences

### HK\*2810 Human Physiology I - Concepts and Principles W (3-0) [0.50]

This course will introduce the fundamental concepts and principles of communication systems (transport, ion movement, nerve and synapse, muscle) in humans. It will focus on primary physiological communication systems, such as the endocrine and central nervous systems, and integrate basic principles to understand larger systems such as the gastrointestinal tract.

*Prerequisite(s):* BIOC\*2580, BIOL\*1080

*Restriction(s):* HK\*3940

*Department(s):* Department of Human Health and Nutritional Sciences

### 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\*3200, HK\*3810, HK\*3940 , ZOO\*3200 , ZOO\*3600

*Restriction(s):* Restricted to B.Sc. Major in Human Kinetics or Neuroscience Minor.

*Department(s):* Department of Human Health and Nutritional Sciences

### 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\*3810 or HK\*3940

*Restriction(s):* HK\*3501/2. Registration in the B.Sc. Major in Human Kinetics or Bio-Medical Science.

*Department(s):* Department of Human Health and Nutritional Sciences

### 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\*3810 or HK\*3940

*Restriction(s):* HK\*3501/2. Registration in the B.Sc. Major in Human Kinetics or Bio-Medical Science.

*Department(s):* Department of Human Health and Nutritional Sciences

### 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

*Department(s):* Department of Human Health and Nutritional Sciences

### 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\*3810 or HK\*3940

*Restriction(s):* HK\*3401/2. Registration in the B.Sc. Major in Human Kinetics or Bio-Medical Science. Instructor consent required.

*Department(s):* Department of Human Health and Nutritional Sciences

### 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\*3810 or HK\*3940

*Restriction(s):* HK\*3401/2. Registration in the B.Sc. Major in Human Kinetics or Bio-Medical Science. Instructor consent required.

*Department(s):* Department of Human Health and Nutritional Sciences

### 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

*Department(s):* Department of Human Health and Nutritional Sciences

### 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\*3810 or HK\*3940

*Restriction(s):* Registration in the Human Kinetics major.

*Department(s):* Department of Human Health and Nutritional Sciences

### HK\*3810 Human Physiology II - Integrated Systems F (4-0) [0.75]

This course will build on the fundamental concepts and principles of communication systems developed in Human Physiology I and examine more complex physiological phenomena such as the control of blood volume and blood pressure, which integrates tissue of the cardiovascular system, the heart, vasculature and kidney, and acid-based physiology, which integrates the respiratory system and the kidney. Finally, all systems will be integrated to determine how the body responds to challenges such as altitude, exercise and shock (blood loss).

*Offering(s):* First offering - Fall 2016

*Prerequisite(s):* HK\*2810

*Restriction(s):* HK\*3940

*Department(s):* Department of Human Health and Nutritional Sciences

### HK\*4070 Clinical Biomechanics W (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)

*Department(s):* Department of Human Health and Nutritional Sciences

### 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.

*Department(s):* Department of Human Health and Nutritional Sciences

### 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):* ENGG\*1210 or HK\*3600

*Department(s):* Department of Human Health and Nutritional Sciences

**HK\*4340 Genomics: Exercise and Disease F (3-0) [0.50]**

This course is an in-depth examination of how exercise 1) effects gene transcription to influence elite performance (ie. training for sport) and 2) can be used as a therapeutic strategy to influence the expression of specific genes to recover the health of an individual (ie. exercising for health). The course represents a unique opportunity to understand the beneficial effects of physical activity and exercise at the genetic level.

*Prerequisite(s):* NUTR\*3360

*Department(s):* Department of Human Health and Nutritional Sciences

**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.

*Department(s):* Department of Human Health and Nutritional Sciences

**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.

*Department(s):* Department of Human Health and Nutritional Sciences

**HK\*4371/2 Research in Human Health and Nutritional Sciences II S-F,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.

*Department(s):* Department of Human Health and Nutritional Sciences

**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.

*Department(s):* Department of Human Health and Nutritional Sciences

**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\*3810 or HK\*3940 )

*Restriction(s):* Course coordinator consent required.

*Department(s):* Department of Human Health and Nutritional Sciences

**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\*3810 or HK\*3940 )

*Restriction(s):* Course coordinator consent required.

*Department(s):* Department of Human Health and Nutritional Sciences

**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.

*Department(s):* Department of Human Health and Nutritional Sciences

**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\*3810 or HK\*3940 ), NUTR\*4210

*Department(s):* Department of Human Health and Nutritional Sciences

**HK\*4510 Teaching, Learning & Knowledge Transfer S,F,W (0-12) [1.00]**

In consultation with a faculty advisor, the student will select, design and complete an independent project on the scholarship of teaching, learning and/or knowledge transfer in human health. 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):* 10.00 credits including BIOL\*1080

*Restriction(s):* Course coordinator consent required.

*Department(s):* Department of Human Health and Nutritional Sciences

**HK\*4511 Teaching, Learning & Knowledge Transfer II S,E,W (0-6) [0.50]**

First part of a two-semester course HK\*4511/2. In consultation with a faculty advisor, the student will select, design and complete an independent project on the scholarship of teaching, learning and/or knowledge transfer in human health. This is a two-semester course offered over consecutive semesters; when you select it you must select HK\*4511 in the first semester and HK\*4512 in the second semester (a grade will not be assigned to HK\*4511 until HK\*4512 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):* 10.00 credits including BIOL\*1080

*Restriction(s):* Course coordinator consent required.

*Department(s):* Department of Human Health and Nutritional Sciences

**HK\*4610 Health and Injury Biomechanics F (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.

*Prerequisite(s):* ENGG\*3150 or HK\*2270

*Department(s):* Department of Human Health and Nutritional Sciences

**HK\*4511/2 Teaching, Learning & Knowledge Transfer II S,E,W (0-6) [1.00]**

In consultation with a faculty advisor, the student will select, design and complete an independent project on the scholarship of teaching, learning and/or knowledge transfer in human health. This is a two-semester course offered over consecutive semesters; when you select it you must select HK\*4511 in the first semester and HK\*4512 in the second semester (a grade will not be assigned to HK\*4511 until HK\*4512 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):* 10.00 credits including BIOL\*1080

*Restriction(s):* Course coordinator consent required.

*Department(s):* Department of Human Health and Nutritional Sciences

**HK\*4512 Teaching, Learning & Knowledge Transfer II. S,F,W (0-6) [0.50]**

Second part of a two-semester course HK\*4511/2. In consultation with a faculty advisor, the student will select, design and complete an independent project on the scholarship of teaching, learning and/or knowledge transfer in human health. This is a two-semester course offered over consecutive semesters; when you select it you must select HK\*4511 in the first semester and HK\*4512 in the second semester (a grade will not be assigned to HK\*4511 until HK\*4512 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\*4511

*Restriction(s):* Course coordinator consent required.

*Department(s):* Department of Human Health and Nutritional Sciences

**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\*3810 or HK\*3940

*Department(s):* Department of Human Health and Nutritional Sciences

**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.

*Department(s):* Department of Human Health and Nutritional Sciences

## Humanities

### College of Arts

#### HUMN\*1030 What Makes a Literary Classic? F (3-0) [0.50]

Why are some books considered classics? What is the nature of their impact on literature, on culture, at either the national or world level, on their age? The focus of this course will be on works that are considered classics, from different ages and from different national and linguistic traditions, as well as theoretical essays. Texts read will be in English translation.

*Offering(s):* Offered in odd-numbered years.

*Department(s):* School of Languages and Literatures

#### HUMN\*1300 Fundamentals of Arts Management I W (3-0) [0.50]

This course provides an introduction to arts, culture, and heritage management as a career possibility. Students will develop an understanding of management and communication as they relate to the cultural sector (visual art, film and theatre, sound/music, and heritage). Course assignments and projects will deal with the broad range of issues facing those who work in management/administration of the arts, whether in the public or the private sectors.

*Department(s):* School of Fine Art and Music

#### HUMN\*2020 The Criminal Mind in Italian Cinema W (3-0) [0.50]

This course explores criminality and the criminal mind in Italian film noir, thriller, and 'cop movies' from the postwar period to the present. It examines the collusion between crime, politics, and society, the homegrown Italian terrorism of the 1970s, and post-millennial representations of the connections between mafia and other criminal activities.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 2.00 credits

*Department(s):* School of Languages and Literatures

#### HUMN\*2300 Fundamentals of Arts Management II F (3-0) [0.50]

This course provides an in-depth investigation of the practice of arts management in the Canadian context. Students will explore and research the history and structure of arts funding and arts organizations and learn the basis of art entrepreneurship in the Canadian context.

*Prerequisite(s):* HUMN\*1300

*Department(s):* School of Fine Art and Music

#### HUMN\*3000 Narratives of Migration W (3-0) [0.50]

People move from one location to another for a variety of reasons. This course examines how literary texts and other forms of creative expression represent various forms of dislocation such as migration and exile. The focus of the course will be on theories of migration and creative works in an array of texts and media. Texts will be read in English translation.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 7.50 credits

*Department(s):* School of Languages and Literatures

#### HUMN\*3020 Myth and Fairy Tales in Germany W (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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 5.00 credits

*Department(s):* School of Languages and Literatures

#### 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.

*Department(s):* Dean's Office, College of Arts

#### 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.

*Department(s):* Dean's Office, College of Arts

#### HUMN\*3190 Experiential Learning S,F,W (0-0) [0.50]

This course provides an opportunity for independent study based in the Arts and/or Humanities related to either voluntary or paid experience. Evaluation will be based on assignments directly related to the experience. Students interested in this course must have their project approved by the instructor and the office of the Associate Dean (Academic) of the College of Arts prior to the semester in which they plan to engage in their experiential learning experience.

*Prerequisite(s):* 7.50 credits

*Restriction(s):* Instructor consent required.

*Department(s):* Dean's Office, College of Arts

#### 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.

*Department(s):* Dean's Office, College of Arts

#### 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.

*Department(s):* Dean's Office, College of Arts

#### 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.

*Department(s):* Dean's Office, College of Arts

#### 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.

*Department(s):* Dean's Office, College of Social and Applied Human Sciences

#### HUMN\*3300 Latin American Studies in the Humanities F,W (1-2) [0.50]

This is an integrated course of studies in the humanities as they relate to the resources of Latin America. It is offered either as preparation for the Latin America semester (in fall) or during this study abroad program (in winter).

*Prerequisite(s):* Admission to the Latin America semester.

*Restriction(s):* Instructor consent required.

*Department(s):* Dean's Office, College of Arts

#### HUMN\*3400 Renaissance Lovers and Fools F (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

*Department(s):* Dean's Office, College of Arts

#### HUMN\*3470 Holocaust & WWII in German Lit. & Film W (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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 5.00 credits

*Department(s):* School of Languages and Literatures

**HUMN\*4190 Experiential Learning S,F,W (0-0) [0.50]**

This course provides an opportunity for independent study based in the Arts and/or Humanities related to either voluntary or paid experience. Evaluation will be based on assignments directly related to the experience. Students interested in this course must have their project approved by the instructor and the office of the Associate Dean (Academic) of the College of Arts prior to the semester in which they plan to engage in their experiential learning experience.

*Prerequisite(s):* 10.00 credits

*Restriction(s):* Instructor consent required.

*Department(s):* Dean's Office, College of Arts

## Interdisciplinary Physical Science

### **IPS\*1500 Integrated Mathematics and Physics I F (6-4) [1.00]**

This is a foundational course for students in B.Sc. mathematical and physical sciences majors. The disciplines of Mathematics and Physics are taught in an integrated fashion that demonstrates how they support and enrich one another. Atomic structure, algebra and trigonometry, forces and Newton's laws, functions and graphing, differentiation, angular momentum and energy conservation, limits, integration, kinematics, and special relativity are presented in a harmonized fashion to ensure students have an improved understanding of these fundamentals.

*Prerequisite(s):* 1 of 4U Physics, PHYS\*1020 , PHYS\*1300

*Restriction(s):* MATH\*1080, MATH\*1200, PHYS\*1000 , PHYS\*1080

*Department(s):* Department of Physics, Department of Mathematics and Statistics

### **IPS\*1510 Integrated Mathematics and Physics II W (6-4) [1.00]**

This is the second foundational course for students in B.Sc. mathematical and physical sciences majors. The disciplines of Mathematics and Physics are taught in an integrated fashion that demonstrates how they support and enrich one another. Thermodynamics, integration, electrostatics, partial derivatives, multidimensional integrals, simple harmonic motion, Taylor's series, and spectroscopy are presented in a harmonized fashion to ensure students have an improved understanding of these fundamentals.

*Prerequisite(s):* IPS\*1500

*Restriction(s):* MATH\*1210, MATH\*2080, PHYS\*1010, PHYS\*1070, PHYS\*1130

*Department(s):* Department of Physics, Department of Mathematics and Statistics

### **IPS\*3000 Science Communication F (3-3) [0.50]**

This course focuses on developing the skills required to communicate science for non-specialist audiences. The principles and practices of public speaking and writing will be explored, employing a variety of media. Through multiple oral and written assignments, students will explore tailoring their message for various audience-types.

*Prerequisite(s):* 2.00 credits in PHYS at the 2000 level or higher

*Restriction(s):* PHYS\*4300

*Department(s):* Department of Physics

## 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(s):* Department of Political Science

### 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.

*Department(s):* Dean's Office, College of Arts

### 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.

*Department(s):* Dean's Office, College of Arts

### 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.

*Department(s):* Dean's Office, College of Social and Applied Human Sciences

### 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.

*Department(s):* Dean's Office, College of Social and Applied Human Sciences

### 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.

*Department(s):* Dean's Office, College of Social and Applied Human Sciences

### ISS\*3300 Latin American Studies in the Social Sciences F,W (1-2) [0.50]

This is an integrated course of studies in the social sciences as they relate to the resources of Latin America. It is offered either as preparation for the Latin America semester (in fall) or during this study abroad program (in winter).

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

*Department(s):* Dean's Office, College of Arts

### 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.

*Prerequisite(s):* SOAN\*2111/2 or POLS\*2000

*Restriction(s):* Not available to students in Anthropology, Criminal Justice & Public Policy or Sociology areas of study.

*Department(s):* Department of Sociology and Anthropology, Department of Political Science

## Interdisciplinary University

UNIV\*3500 , UNIV\*3550 and UNIV\*4500 are re-numbered and now appear under Environmental Design and Rural Development (EDRD)

### UNIV\*1150 The Politics, Science and Culture of Hunger W (0-0) [1.00]

Hunger is one of the most pressing challenges confronting societies across the globe. Incorporating the perspectives of the sciences, social sciences and humanities, the course will examine hunger as a lived experience and the challenges that face those who are working to eradicate it. Using a case-based approach students will examine issues that require consideration of interdisciplinary fields of study including: global economic and political forces; underlying scientific and technological issues particularly as they relate to agriculture; the interplay of governmental and non-governmental agencies, along with supra-governmental agencies such as the United Nations, the World Food Program and the International Monetary Fund; and the importance of culture and beliefs in shaping attitudes in the developed and developing world.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 2.00 credits

*Restriction(s):* First year students with a maximum of 5.50 credits. Instructor consent required.

*Department(s):* Provost & VP Academic

### UNIV\*1200 First Year Seminar F,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.

*Department(s):* Provost & VP Academic

### 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. Acceptance in the Peer Helper program.

*Department(s):* Associate VP Academic

### 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 for more information.

*Prerequisite(s):* UNIV\*1250

*Department(s):* Associate VP Academic

### UNIV\*2200 Towards Sustainability F (3-0) [0.50]

This course will introduce students to the complex and interrelated issues of sustainability. It will explore why it is important to understand the environmental, economic and social issues of our world and why they must be addressed in a holistic way. It will allow students to realize the impact they will make on the world and give them the knowledge to develop values that will help chart their career. This course will provide the opportunity to understand issues beyond their chosen discipline.

*Prerequisite(s):* 4.50 credits

*Department(s):* Department of Management

### 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

*Department(s):* Associate VP Academic

### 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

*Department(s):* Associate VP Academic

### UNIV\*2410 Engaged Global Citizenship W (3-0) [0.50]

In this course students will gain an understanding of the concepts, values, and skills related to effective community engagement and responsible global citizenship. As culturally-aware global citizens, students will be challenged to identify a meaningful role for themselves in contributing to a more equitable and sustainable environment by developing an action plan for participating in service activities at the local, national or international scale.

*Prerequisite(s):* 4.00 credits

*Department(s):* Department of Political Science

### 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

*Department(s):* Associate VP Academic

### 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.

*Department(s):* Dean's Office, College of Arts

### 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.

*Department(s):* Dean's Office, College of Arts

### 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.

*Department(s):* Dean's Office, College of Arts

### 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.

*Department(s):* Dean's Office, College of Arts

### 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.

*Department(s):* Dean's Office, College of Arts

### 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.

*Department(s):* Dean's Office, College of Arts

### 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.

*Department(s):* Dean's Office, College of Arts

**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.

*Department(s):* Dean's Office, College of Arts

**UNIV\*3240 University Studies in Shanghai III 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.

*Department(s):* Dean's Office, College of Arts

**UNIV\*4410 Civic Engagement with Communities F (3-0) [0.50]**

In this capstone course students will critically reflect on the connections they have developed between their personal identity as engaged citizens and the impacts their contributions have made with the broader community. An e-portfolio of their experiential learning activities will be used to gain an appreciation of their personal growth and acquired skills, and to identify the challenges and opportunities in a lifelong commitment to social justice, sustainability, and respect for diversity.

*Prerequisite(s):* UNIV\*2410, 90 hours of approved community service.

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Political Science

## Integrative Biology

*Department of Integrative Biology*

### IBIO\*3100 Interpreting Biodiversity I W (1.5-3) [0.50]

This is the first of two courses that explore global and local issues in biodiversity as a capstone experience for biodiversity majors. The overall goal of the course is to provide opportunities for BIOD students to engage the application of their knowledge and skills to complex problems and issues involving “real-life” biodiversity projects within academic, government, or industry spheres. The learning outcomes include the development of key skills for interpreting biodiversity and writing a research proposal and work plan that will be executed in IBIO\*4100.

*Prerequisite(s):* 12.00 credits

*Restriction(s):* Enrolment restricted to BSCH:BIOD majors.

*Department(s):* Department of Integrative Biology

### IBIO\*4100 Interpreting Biodiversity II F (1.5-3) [1.00]

This is the second of two courses that explore global and local issues in biodiversity as a capstone experience for biodiversity majors. The overall goal of the course is to provide opportunities for students to engage the application of their knowledge and skills to complex problems and issues involving “real-life” biodiversity projects within academic, government, or industry spheres. The learning outcomes include the application of key skills for interpreting biodiversity, the collection and analysis of biodiversity data. This student centred experience will culminate with an oral presentation and written report to the “clients”, classmates and instructors.

*Prerequisite(s):* IBIO\*3100

*Restriction(s):* Enrolment restricted to BSCH:BIOD majors.

*Department(s):* Department of Integrative Biology

### IBIO\*4500 Research in Integrative Biology I F,W (0-12) [1.00]

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):* 12.00 credits

*Restriction(s):* Minimum cumulative average of 70%. Instructor consent required.

*Department(s):* Department of Integrative Biology

### IBIO\*4510 Research in Integrative Biology II F,W (0-12) [1.00]

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

*Restriction(s):* Minimum cumulative average of 70%. Instructor consent required.

*Department(s):* Department of Integrative Biology

### 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. Permission of course coordinator.

*Department(s):* Department of Integrative Biology

### 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. Permission of course coordinator.

*Department(s):* Department of Integrative Biology

### 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

*Department(s):* Department of Integrative Biology

### IBIO\*4600 Integrative Marine and Freshwater Research F (3-3) [1.00]

In this course, students will integrate theory and analytical methods to address common problems in marine and freshwater biology. Particular emphasis will be placed on the process of inquiry including: development of research problems, data retrieval from existing literature, design and interpretation of experiments, sampling, statistical inference, and written and oral presentation.

*Prerequisite(s):* BIOL\*3450, (STAT\*2040 or STAT\*2230), (1 of ZOO\*3200 , ZOO\*3210 , ZOO\*3610)

*Restriction(s):* Restricted to students in BSCH.MFB.

*Department(s):* Department of Integrative Biology

## International Development

### **IDEV\*1000 Understanding Development and Global Inequalities F (3-0) [0.50]**

The objective of the course is to provide an introduction to the study of international development as a contested and evolving effort to counteract global inequalities. Students will learn about the historical and political origins of the international development system, as well as the main development actors and institutions. The course will provide an introduction to foundational concepts within development studies, including poverty, inequality, human rights, foreign aid, and sustainable development.

*Department(s):* Dean's Office, College of Social and Applied Human Sciences

### **IDEV\*2400 Development, Social Justice and Human Rights W (3-0) [0.50]**

This course will explore the nature of social justice and links to concepts and practice of human rights. It examines how development can be seen in terms of the advancement of social justice. Students will identify and critically assess alternative approaches to promoting social justice within a development context and the related actions by actors locally and globally. It will explore the related ethical issues associated with development policy and practice. Key topics will include poverty, hunger, power, gender, race, and class.

*Prerequisite(s):* IDEV\*1000

*Department(s):* Dean's Office, College of Social and Applied Human Sciences

### **IDEV\*2500 International Development Studies W (4-0) [0.50]**

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.

*Department(s):* Dean's Office, College of Social and Applied Human Sciences

### **IDEV\*3000 Poverty and Inequality F (3-0) [0.50]**

This course explores the nature and determinants of poverty and inequality at the local and global levels and the interrelationship between these. It examines the patterns and dynamics of poverty and inequality, for example over time and geographically. In so doing, it explores the nature and practical application of alternative approaches to their assessment and measurement. Students will reflect on and critically assess diverse approaches to reducing poverty and inequality locally and globally.

*Prerequisite(s):* 7.50 credits including IDEV\*2500

*Department(s):* Dean's Office, College of Social and Applied Human Sciences

### **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.

*Department(s):* Dean's Office, College of Social and Applied Human Sciences

### **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):* Instructor consent required. Written approval of the faculty advisor for International Development.

*Department(s):* Dean's Office, College of Social and Applied Human Sciences

### **IDEV\*3300 Engaging in Development Practice F,W (3-0) [0.50]**

This course provides an opportunity for students to engage with development practitioners in a real-world context. Students will implement a community engagement project determined in consultation with a community partner. The focus of engagement opportunities will be on the analysis of a development issue and defining related policy and/or practice options. The course explores the challenges associated with engaging with development practitioners in the real world and equips students with the necessary skills for successful engagement.

*Prerequisite(s):* 7.50 credits including IDEV\*2500

*Restriction(s):* Restricted to students in BAH.IDEV.

*Department(s):* Dean's Office, College of Social and Applied Human Sciences

### **IDEV\*3400 Managing and Evaluating Change in Development W (3-0) [0.50]**

This course explores the key practical skills required by those engaged in the implementation of development policy and practice including logical frameworks, theories of change, impact assessment, and project management. It aims to equip students with an understanding of the nature of these techniques, and how and where they are employed. The strengths and weaknesses of these techniques and their implications for development policy and practice are explored.

*Prerequisite(s):* 7.50 credits including IDEV\*2500

*Department(s):* Dean's Office, College of Social and Applied Human Sciences

### **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):* Instructor consent required. Written approval of the faculty advisor for International Development.

*Department(s):* Dean's Office, College of Social and Applied Human Sciences

### **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):* Instructor consent required. Written approval of the faculty advisor for International Development.

*Department(s):* Dean's Office, College of Social and Applied Human Sciences

### **IDEV\*4500 International Development Seminar F,W (3-0) [1.00]**

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. Instructor consent required. Written approval of the faculty advisor for International Development.

*Department(s):* Dean's Office, College of Social and Applied Human Sciences

## 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,W (4-0) [0.50]**

This is 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.

*Offering(s):* Also offered through Distance Education format.

*Restriction(s):* Not available to students who have credit for 4U Italian or equivalent.

*Department(s):* School of Languages and Literatures

#### **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.

*Prerequisite(s):* ITAL\*1060

*Restriction(s):* This course may not be taken by students who have OAC Italian or equivalent.

*Department(s):* School of Languages and Literatures

#### **ITAL\*2090 Intermediate Italian F (4-0) [0.50]**

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

*Department(s):* School of Languages and Literatures

#### **ITAL\*3060 Advanced Italian W (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\*2090

*Department(s):* School of Languages and Literatures

#### **ITAL\*3400 Renaissance Lovers and Fools F (4-0) [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\*3060

*Co-requisite(s):* HUMN\*3400

*Restriction(s):*,

*Department(s):* School of Languages and Literatures

#### **ITAL\*3700 Experiential Learning and Language S,F,W (0-0) [0.50]**

This course provides an opportunity for independent study based on an experiential project in Italian. The project (approximately 70 hours) must be approved by a faculty member in the School of Languages and Literatures. It will include research about experiential learning, a reflective piece of writing and a public oral presentation about the project.

*Prerequisite(s):* 10.00 credits including 1.50 credits in Italian.

*Restriction(s):* A minimum cumulative average of 70% in all Italian course attempts. Instructor consent required.

*Department(s):* School of Languages and Literatures

#### **ITAL\*4900 Research Project in Italian Studies F,W (3-0) [0.50]**

This is 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):* ITAL\*3060, ITAL\*3400

*Department(s):* School of Languages and Literatures

## 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.

*Department(s):* School of Environmental Design and Rural Development

### 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.

*Department(s):* School of Environmental Design and Rural Development

### 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.

*Department(s):* School of Environmental Design and Rural Development

### LARC\*2100 Landscape Analysis F (2-2) [0.50]

This course is 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

*Department(s):* School of Environmental Design and Rural Development

### 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.

*Department(s):* School of Environmental Design and Rural Development

### 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.

*Department(s):* School of Environmental Design and Rural Development

### 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

*Department(s):* School of Environmental Design and Rural Development

### 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

*Department(s):* School of Environmental Design and Rural Development

### 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.

*Offering(s):* Also offered through Distance Education format.

*Department(s):* School of Environmental Design and Rural Development

### 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

*Department(s):* School of Environmental Design and Rural Development

### 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

*Department(s):* School of Environmental Design and Rural Development

### 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

*Department(s):* School of Environmental Design and Rural Development

### 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

*Department(s):* School of Environmental Design and Rural Development

### 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.

*Prerequisite(s):* LARC\*2100, LARC\*2240

*Department(s):* School of Environmental Design and Rural Development

### 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

*Department(s):* School of Environmental Design and Rural Development

### 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

*Department(s):* School of Environmental Design and Rural Development

### LARC\*3500 Independent Study S,F,W (0-6) [0.50]

In this course 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

*Restriction(s):* Instructor consent required.

*Department(s):* School of Environmental Design and Rural Development

### 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

*Department(s):* School of Environmental Design and Rural Development

### 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\*3060, LARC\*3440

*Department(s):* School of Environmental Design and Rural Development

### 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

*Department(s):* School of Environmental Design and Rural Development

**LARC\*4620 Internship in Landscape Architecture S,F,W (0-10) [1.00]**

This course provides an experiential learning opportunity requiring professional office experience and faculty supervision under program regulations with 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

*Restriction(s):* Instructor consent required.

*Department(s):* School of Environmental Design and Rural Development

**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\*3070, LARC\*4510

*Department(s):* School of Environmental Design and Rural Development

**LARC\*4730 Special Study in Landscape Architecture S,F,W (0-4) [0.50]**

This is a supervised independent study course involving competitions, special projects, modules, and other formats.

*Prerequisite(s):* LARC\*3040

*Restriction(s):* Instructor consent required.

*Department(s):* School of Environmental Design and Rural Development

**LARC\*4740 Case Studies S,F,W (0-6) [0.50]**

Students participate in a case study supervised by a faculty member. Travel and field studies may be involved and may entail additional costs. Students are required to submit a major paper or project.

*Prerequisite(s):* LARC\*3040

*Restriction(s):* Instructor consent required.

*Department(s):* School of Environmental Design and Rural Development

## 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.

*Restriction(s): This course may not be taken by anyone who has Grade 12 Latin*

*Department(s): School of Languages and Literatures*

#### LAT\*1110 Preliminary Latin II W (3-0) [0.50]

A continuation of LAT\*1100.

*Prerequisite(s): LAT\*1100 or Grade 12 Latin*

*Department(s): School of Languages and Literatures*

#### 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*

*Department(s): School of Languages and Literatures*

#### 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*

*Department(s): School of Languages and Literatures*

#### 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*

*Department(s): School of Languages and Literatures*

## Linguistics

*School of Languages and Literatures*

### **LING\*1000 Introduction to Linguistics F,W (3-0) [0.50]**

The nature of language. An elementary survey of linguistic disciplines. Phonetics, morphology, syntax, semantics, language, and society.

*Offering(s):* Also offered through Distance Education format.

*Department(s):* School of Languages and Literatures

### **LING\*2400 Phonetics W (3-0) [0.50]**

This course studies central concepts in phonetics such as speech anatomy, acoustics, articulation, analysis and perception of vowels, consonants and suprasegmentals as well as the International Phonetic Alphabet.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* LING\*1000

*Department(s):* School of Languages and Literatures

## Management

*Department of Management*

*Department of Marketing and Consumer Studies*

*School of Hospitality, Food, and Tourism Management*

### MGMT\*1000 Introduction to Business F (4-0) [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.

*Restriction(s):* CME\*1000 , MGMT\*2150. Registration in B.Comm. and fewer than 7.50 credits.

*Department(s):* School of Hospitality, Food and Tourism Management

### MGMT\*1100 Business Career Preparation F,W (1-0) [0.00]

This course is designed to provide students with knowledge and tools to enhance their career readiness skills, leading to a greater level of confidence and success when approaching the career search process. Students will be guided through a framework for career management and steps to create a personal "career toolkit". This would include materials and resources such as a resume and cover letter, best practices for making more informed decisions about career paths, how to access to career opportunities and presenting themselves professionally to employers. The majority of the course will be delivered online via CourseLink, supplemented by two in-class activities. A pass/fail grade will be assigned upon completion of the course.

*Offering(s):* First offering - Fall 2019

*Prerequisite(s):* 4.00 credits

*Restriction(s):* COOP\*1100. Restricted to students in B.Comm. with fewer than 10.00 credits.

*Department(s):* Dean's Office, College of Business and Economics

### 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. **Note:** Students registered in the B.Comm program are required to select MGMT\*1000 Introduction to Business.

*Offering(s):* Also offered through Distance Education format.

*Equate(s):* HTM\*2150

*Restriction(s):* MGMT\*1000

*Restriction(s):* Not available to students in the B.Comm. program.

*Department(s):* School of Hospitality, Food and Tourism Management

### MGMT\*3020 Corporate Social Responsibility S,F,W (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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 9.00 credits

*Equate(s):* BUS\*3020

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Management

### MGMT\*3030 Managerial Communications and Team Leadership W (3-0) [0.50]

This course is designed to enhance managerial skills in interpersonal communication (both oral and written), team leadership and meeting facilitation through an intensive seminar experience. The content of the seminars are based on a review of the 'great books' of leadership and management. Students will collectively select, review, discuss and debate the texts, and upon successful completion of the course will have further developed their skills in critical enquiry, consultation, evaluation, presentation, facilitation and leadership

*Prerequisite(s):* 12.50 credits.

*Restriction(s):* Restricted to students in BComm with a minimum 70% cumulative average. Instructor consent required.

*Department(s):* School of Hospitality, Food and Tourism Management

### MGMT\*3320 Financial Management S,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.

*Offering(s):* Also offered through Distance Education format.

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

*Equate(s):* BUS\*3320

*Restriction(s):* Registration in BCOMM or BA.EURS area of emphasis in European Business Studies.

*Department(s):* Department of Management

### MGMT\*3400 Current Topics in Management S,F,W (3-0) [0.50]

This course provides a lecture, discussion or seminar program on a selected topic or current issue in management. The specific topic of the course will be identified on an ad hoc basis as contemporary issues and topics in management arise.

*Prerequisite(s):* 9.00 credits including (MGMT\*1000 or MGMT\*2150)

*Restriction(s):* BUS\*4250 , HTM\*4200 . Restricted to students in B.Comm. and BAH.EURS\_EBS. This is a Priority Access Course. See department for more information.

*Department(s):* Department of Management

### MGMT\*4000 Strategic Management F,W (3-0) [0.50]

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.

*Prerequisite(s):* (1 of ECON\*2560, ECON\*3460 , ECON\*3560 ), MGMT\*3320, (1 of FARE\*3310, HTM\*3120, REAL\*3890)

*Restriction(s):* BUS\*4250 , HTM\*4200 . Restricted to students in B.Comm. and BAH.EURS\_EBS. This is a Priority Access Course. See department for more information.

*Department(s):* School of Hospitality, Food and Tourism Management

### MGMT\*4020 Interdisciplinary Food Product Development I F (3-3) [0.50]

This is an interdisciplinary course that involves management, food science and human health and nutrition majors. This course requires interdisciplinary teams of students to develop new food products, services and business ventures for the agricultural and food industries. Processes include analyzing, planning, coordinating and implementing information required for the conception, promotion and distribution of new food products and marketing ideas designed to create and maintain beneficial exchanges between food and agricultural industries while meeting the expectations and demands of consumers and the economy.

*Prerequisite(s):* 14.00 credits, minimum 70% cumulative average

*Restriction(s):* FOOD\*4260. Students in BCOMM, BSC:FOOD and BSC:NANS majors. Instructor consent required.

*Department(s):* Department of Marketing and Consumer Studies

### MGMT\*4030 Interdisciplinary Food Product Development II W (3-3) [0.50]

This is an interdisciplinary food product development course that involves management, food science and human health and nutrition majors. This course requires interdisciplinary teams of students to develop new food products, services and business ventures for the agricultural and food industries. Processes include analyzing, planning, coordinating and implementing information required for the conception, promotion and distribution of new food products and marketing ideas designed to create and maintain beneficial exchanges between food and agricultural industries while meeting the expectations and demands of consumers and the economy.

*Prerequisite(s):* MGMT\*4020, minimum 70% cumulative average

*Restriction(s):* FOOD\*4270. Students in BCOMM, BSC:FOOD and BSC:NANS majors. Instructor consent required.

*Department(s):* Department of Marketing and Consumer Studies

### MGMT\*4050 Business Consulting F,W (3-0) [0.50]

Offered through the Centre for Business and Student Enterprise (CBaSE), this project-based course is designed to provide students with an opportunity to engage with community organizations by working as consultants in interdisciplinary teams, and to investigate and propose sustainable solutions to live cases put forth by real world clients. Project requirements will vary based on the needs of the assigned client.

*Prerequisite(s):* (1 of MCS\*1000, MGMT\*1000, MGMT\*2150), 10.00 credits, minimum 70% cumulative average

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Marketing and Consumer Studies

**MGMT\*4060 Business Consulting F,W (3-0) [0.50]**

Offered through the Centre for Business and Student Enterprise (CBaSE), this project-based course is designed to provide students with an opportunity to engage with community organizations by working as consultants in interdisciplinary teams, and to investigate and propose sustainable solutions to live cases put forth by real world clients. Project requirements will vary based on the needs of the assigned client.

*Prerequisite(s):* (1 of MCS\*1000, MGMT\*1000, MGMT\*2150), 10.00 credits, minimum 70% cumulative average

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Marketing and Consumer Studies

**MGMT\*4260 International Business W (3-3) [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.

*Prerequisite(s):* 14.50 credits

*Equate(s):* BUS\*4260

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

*Department(s):* Department of Management

**MGMT\*4350 Business Case Competition Preparation F (3-0) [0.50]**

This course will focus on the critical analysis of current business practices through the use of case studies to develop integrative decision-making, negotiation and presentation skills. Strategy formulation and implementation will be investigated in the context of complex business case competitions.

*Prerequisite(s):* 9.50 credits,

*Restriction(s):* Restricted to students in B.Comm. Minimum of 70% cumulative average. Instructor consent required.

*Department(s):* Department of Management

**MGMT\*4991 Management Thesis S,F,W (3-0) [1.00]**

This two semester course represents the production of an undergraduate thesis in any management discipline. The thesis is an independent research project under the direct supervision of an individual faculty member. The research topic will be chosen in consultation with a faculty advisor, and will normally reflect the student's major in the Bachelor of Commerce program. 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 two-semester course is offered over any two consecutive semesters, with MGMT\*4991 in the first semester and MGMT\*4992 in the second semester. A grade will not be assigned in MGMT\*4991 until MGMT\*4992 has been completed.

*Prerequisite(s):* 14.00 credits

*Restriction(s):* Restricted to students registered in the Bachelor of Commerce program with a minimum cumulative GPA of 70%. Instructor consent required.

*Department(s):* Dean's Office, College of Business and Economics, Department of Economics and Finance, Department of Food, Agricultural and Resource Economics, Department of Management, Department of Marketing and Consumer Studies, School of Hospitality, Food and Tourism Management

**MGMT\*4991/2 Management Thesis S,F,W (3-0) [1.00]**

This two semester course represents the production of an undergraduate thesis in any management discipline. The thesis is an independent research project under the direct supervision of an individual faculty member. The research topic will be chosen in consultation with a faculty advisor, and will normally reflect the student's major in the Bachelor of Commerce program. 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 two-semester course is offered over any two consecutive semesters, with MGMT\*4991 in the first semester and MGMT\*4992 in the second semester. A grade will not be assigned in MGMT\*4991 until MGMT\*4992 has been completed.

*Prerequisite(s):* 14.00 credits

*Restriction(s):* Restricted to students registered in the Bachelor of Commerce program with a minimum cumulative GPA of 70%. Instructor consent required.

*Department(s):* Dean's Office, College of Business and Economics, Department of Economics and Finance, Department of Food, Agricultural and Resource Economics, Department of Management, Department of Marketing and Consumer Studies, School of Hospitality, Food and Tourism Management

**MGMT\*4992 Management Thesis S,F,W (3-0) [1.00]**

This two semester course represents the production of an undergraduate thesis in any management discipline. The thesis is an independent research project under the direct supervision of an individual faculty member. The research topic will be chosen in consultation with a faculty advisor, and will normally reflect the student's major in the Bachelor of Commerce program. 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 two-semester course is offered over any two consecutive semesters, with MGMT\*4991 in the first semester and MGMT\*4992 in the second semester. A grade will not be assigned in MGMT\*4991 until MGMT\*4992 has been completed.

*Prerequisite(s):* 14.00 credits, MGMT\*4991

*Restriction(s):* Restricted to students registered in the Bachelor of Commerce program with a minimum cumulative GPA of 70%. Instructor consent required.

*Department(s):* Dean's Office, College of Business and Economics, Department of Economics and Finance, Department of Food, Agricultural and Resource Economics, Department of Management, Department of Marketing and Consumer Studies, School of Hospitality, Food and Tourism Management

## 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.

*Offering(s):* Also offered through Distance Education format.

*Restriction(s):* This is a Priority Access Course. 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 FARE\*4370 or HTM\*3080

*Department(s):* Department of Marketing and Consumer Studies

### MCS\*2000 Business Communication in a Changing World F (3-0) [0.50]

This course provides an overview of business communication by reviewing and discussing key issues (such as 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 communication skills

*Prerequisite(s):* 4.00 credits including MCS\*1000

*Restriction(s):* Registration in BCOMM.MKMN or BCOMM.MKMN:C

*Department(s):* Department of Marketing and Consumer Studies

### MCS\*2020 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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 4.00 credits

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information. Not available to students registered in BCOMP program.

*Department(s):* Department of Marketing and Consumer Studies

### 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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 5.00 credits

*Equate(s):* COST\*2100

*Department(s):* Department of Marketing and Consumer Studies

### 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):* MCS\*1000, (1 of BUS\*2090 , HROB\*2090, HROB\*2100 , PSYC\*1000, PSYC\*1200 ). Although not required, it is recommended that students take PSYC\*1000 prior to MCS\*2600.

*Restriction(s):* Registration in BCOMM programs, BCOMM.MKTG minor, or BAH:EURS\_EB This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Marketing and Consumer Studies

### 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 BCOMM: students registered in BCOMM.MKMN, BCOMM.MKMN:C, AGBU, AGBU:C majors.

*Department(s):* Department of Marketing and Consumer Studies

### MCS\*3010 Quality Management W (3-0) [0.50]

This course covers general concepts and expectations of quality assurance from consumer, government, managerial and technological points of view and examines 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, PSYC\*1010, STAT\*2040, STAT\*2060, STAT\*2080)

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Marketing and Consumer Studies

### 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.

*Prerequisite(s):* 1 of ECON\*2740, PSYC\*1010, STAT\*2060

*Restriction(s):* Registration in BCOMM.MKMN, BCOMM.MKMN:C, BCOMM.REH, BCOMM.REH:C, or the BCOMM.MKMN, BCOMM.MKTG minor. This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Marketing and Consumer Studies

### 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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 4.00 credits

*Restriction(s):* Registration in BCOMM. program, BA:BADM minor, or BA:EURS area of emphasis in European Business Studies. This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Marketing and Consumer Studies

### MCS\*3500 Marketing Analytics 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, (1 of ECON\*2740, PSYC\*1010, STAT\*2060)

*Equate(s):* MCS\*3610

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Marketing and Consumer Studies

### 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. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Marketing and Consumer Studies

### 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. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Marketing and Consumer Studies

### 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 BCOMM.MKMN or BCOMM.MKMN:C.. Instructor consent required.

*Department(s):* Department of Marketing and Consumer Studies

**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. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Marketing and Consumer Studies

**MCS\*4060 Retail Management F (3-0) [0.50]**

This course encompasses a comprehensive view of the retailing sector and an application of marketing concepts in both the domestic and international retail marketplace. Key topics include retail format selection, retail management strategy, target shopper analysis, site selection, and merchandise planning. Additional focus will include the buying, financial analysis, and pricing activities involved in retail operations. The course will also investigate the evolving nature of e-commerce and retail supply chain management issues and opportunities.

*Prerequisite(s):* 14.00 credits including MCS\*3600

*Restriction(s):* Registration in BCOMM.MKMN, BCOMM.MKMN:C. This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Marketing and Consumer Studies

**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

*Restriction(s):* Registration in BCOMM.MKMN or BCOMM.MKMN:C.

*Department(s):* Department of Marketing and Consumer Studies

**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. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Marketing and Consumer Studies

**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. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Marketing and Consumer Studies

**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. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Marketing and Consumer Studies

**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. Some restrictions may apply during some time periods. Please contact the department for more information.

*Department(s):* Department of Marketing and Consumer Studies

**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 BCOMM.MKMN or BCOMM.REH major. Instructor consent required.

*Department(s):* Department of Marketing and Consumer Studies

**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 BCOMM.MKMN or BCOMM.REH major. Instructor consent required.

*Department(s):* Department of Marketing and Consumer Studies

**MCS\*4950 Consumer Studies Practicum S,F,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

*Restriction(s):* Registration in BCOMM.MKMN or BCOMM.MKMN:C. Instructor consent required.

*Department(s):* Department of Marketing and Consumer Studies

## Mathematics

### Department of Mathematics and Statistics

#### Suggested initial course sequence:

- For students with 4U or OAC Calculus and expecting to pursue further studies in mathematics or the physical sciences: MATH\*1200, MATH\*1210.
- For students interested in applications to the biological sciences: MATH\*1080, MATH\*2080.
- For students not expecting to pursue further studies in mathematics: MATH\*1030, one STAT\*XXXX course.

### MATH\*1030 Business Mathematics F,W (3-0) [0.50]

Primarily intended for business and economics students, this course is designed to introduce and reinforce the essential mathematical skills needed to understand, analyze, and solve mathematical problems related to business and economics. Topics covered include basic algebra; functions, including a review of exponential and logarithmic functions; sequences and series with financial applications; limits; continuity; and differential calculus including derivatives, higher order derivatives, and curve sketching.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 4U Advanced Functions

*Restriction(s):* MATH\*1080, MATH\*1200 Not available to students registered in the BSC program.

*Department(s):* Department of Mathematics and Statistics

### 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):* IPS\*1500, MATH\*1200

*Department(s):* Department of Mathematics and Statistics

### MATH\*1160 Linear Algebra I F,W (3-0) [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, orthogonalization and projections, linear transformations. Some fundamental proofs and applications of these topics will be included.

*Prerequisite(s):* 4U Calculus and Vectors or 4U Advanced Functions

*Restriction(s):* ENGG\*1500, MATH\*2150 , MATH\*2160

*Department(s):* Department of Mathematics and Statistics

### 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):* IPS\*1500, MATH\*1080

*Department(s):* Department of Mathematics and Statistics

### 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):* MATH\*1080 or MATH\*1200

*Restriction(s):* IPS\*1510, MATH\*2080

*Department(s):* Department of Mathematics and Statistics

### MATH\*2000 Proofs, Sets, and Numbers F (3-1) [0.50]

This course exposes the student to formal mathematical proof, and introduces the theory of sets and number systems. 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. These techniques will be applied to fundamental theorems from linear algebra.

*Prerequisite(s):* 1 of IPS\*1500, MATH\*1080, MATH\*1160, MATH\*1200

*Department(s):* Department of Mathematics and Statistics

### MATH\*2080 Elements of Calculus II 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 IPS\*1500, MATH\*1080, MATH\*1200

*Restriction(s):* IPS\*1510, MATH\*1210

*Department(s):* Department of Mathematics and Statistics

### MATH\*2130 Numerical Methods W (3-1) [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):* 1 of IPS\*1510, MATH\*1210, MATH\*2080

*Department(s):* Department of Mathematics and Statistics

### 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):* 1 of IPS\*1510, MATH\*1210, MATH\*2080

*Department(s):* Department of Mathematics and Statistics

### 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

*Department(s):* Department of Mathematics and Statistics

### MATH\*2270 Applied Differential Equations F (3-1) [0.50]

This course covers the solution of differential equations that arise from problems in engineering and science. 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.

*Prerequisite(s):* (ENGG\*1500 or MATH\*1160), (1 of IPS\*1510, MATH\*1210, MATH\*2080)

*Restriction(s):* MATH\*2170

*Department(s):* Department of Mathematics and Statistics

### MATH\*3100 Differential Equations II W (3-1) [0.50]

This course continues the study of differential equations. Power series solutions around regular singular points including Bessel equations are presented. First order linear systems and their general solution by matrix methods are thoroughly covered. Nonlinear systems are introduced along with the concepts of linearization, stability of equilibria, phase plane analysis, Lyapunov's method, periodic solutions and limit cycles. Two-point boundary value problems are discussed and an introduction to linear partial differential equations and their solution by separation of variables and Fourier series is given.

*Prerequisite(s):* (1 of MATH\*1160, MATH\*2150 , MATH\*2160 ), ( MATH\*2170 or MATH\*2270 )

*Department(s):* Department of Mathematics and Statistics

**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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* MATH\*2000, (1 of MATH\*1160, MATH\*2150 , MATH\*2160 )

*Department(s):* Department of Mathematics and Statistics

**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\*1160 or MATH\*2160 ), 1.00 credits in MATH or STAT at the 2000 level or above

*Department(s):* Department of Mathematics and Statistics

**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\*2210, (MATH\*1160 or MATH\*2160 )

*Department(s):* Department of Mathematics and Statistics

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* (1 of MATH\*1160, MATH\*2150 , MATH\*2160 ), 0.50 credits in statistics

*Co-requisite(s):* MATH\*2200

*Department(s):* Department of Mathematics and Statistics

**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

*Department(s):* Department of Mathematics and Statistics

**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):* (1 of MATH\*1160, MATH\*2150 , MATH\*2160 ), ( MATH\*2170 or MATH\*2270 )

*Department(s):* Department of Mathematics and Statistics

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* MATH\*3200

*Department(s):* Department of Mathematics and Statistics

**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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* MATH\*3200

*Department(s):* Department of Mathematics and Statistics

**MATH\*4150 Topics in Mathematics III F,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 topics.

*Prerequisite(s):* MATH\*3200

*Department(s):* Department of Mathematics and Statistics

**MATH\*4200 Advanced Analysis F (3-0) [0.50]**

This senior course in analysis will cover basic operator theory on Hilbert spaces, including self-adjoint operators and the spectral theorem. Other topics may include weak solutions, Sobolev spaces, inverse problems, measure theoretic probability or advanced topics from linear or nonlinear functional analysis.

*Prerequisite(s):* MATH\*3200

*Department(s):* Department of Mathematics and Statistics

**MATH\*4240 Advanced Topics in Modeling and Optimization W (3-0) [0.50]**

This course is a study of advanced topics in the areas of optimization and modeling. Topics may include continuous and discrete models together with techniques for their analysis and design, and optimization topics such as game theory, networks, nonlinear problems, Markov chains, queuing theory, agent-based models, computational intelligence based techniques and computational optimization techniques.

*Prerequisite(s):* 0.50 credits in Mathematics at the 3000 level.

*Department(s):* Department of Mathematics and Statistics

**MATH\*4270 Partial Differential Equations F (3-0) [0.50]**

This course focuses on first and second-order partial differential equations, with examples and applications from selected fields such as physics, engineering and biology. Topics may include the wave equation, the heat equation, Laplace's equation, linearity and separation of variables, solution by Fourier series, Bessel, Legendre and Green's functions, an introduction to the method of characteristics and Fourier transforms. The classification of linear second-order partial differential equations is discussed.

*Prerequisite(s):* MATH\*3100

*Department(s):* Department of Mathematics and Statistics

**MATH\*4440 Case Studies in Mathematics and Statistics W (3-0) [0.50]**

This capstone course for the Mathematical Science major provides students with an opportunity to synthesize knowledge and utilize problem-solving skills accumulated over the course of their studies. The course will focus on case studies drawn from engineering, computer science, biology, life and physical sciences, medicine, and/or economics.

*Prerequisite(s):* At least 3.0 mathematics and/or statistics credits at the 3000 level or above.

*Restriction(s):* Restricted to students in the Mathematical Science major.

*Department(s):* Department of Mathematics and 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.

*Department(s):* Department of Mathematics and Statistics

## Microbiology

School of Environmental Sciences

Department of Molecular and Cellular Biology

Department of Pathobiology

### MICR\*2420 Introduction to Microbiology S,F,W (3-3) [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\*1070, BIOL\*1080, BIOL\*1090, CHEM\*1040)

*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.

*Department(s):* Department of Molecular and Cellular Biology

### MICR\*2430 Methods in Microbial Culture and Physiology F,W (1.5-3) [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.

*Prerequisite(s):* MICR\*2420

*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.

*Department(s):* Department of Molecular and Cellular Biology

### MICR\*3090 Mycology F (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.

*Prerequisite(s):* BOT\*2100 or MICR\*2430

*Equate(s):* BIOL\*3050

*Department(s):* Department of Molecular and Cellular Biology

### 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.

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

*Department(s):* School of Environmental Sciences

### 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.

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

*Department(s):* Department of Molecular and Cellular Biology, Department of Pathobiology

### MICR\*3260 Microbial Adaptation W (3-1) [0.50]

In this course students examine the physiological responses of bacteria to their diverse and changing environments. By using information technologies to access and analyze the relevant research literature, students learn how and why researchers study this subject, and how research outcomes are evaluated.

*Prerequisite(s):* BIOC\*3560, MBG\*3080

*Department(s):* Department of Molecular and Cellular Biology

### 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.

*Prerequisite(s):* MCB\*2050

*Department(s):* Department of Molecular and Cellular Biology

### 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.

*Prerequisite(s):* BIOC\*3560, MBG\*2040, MICR\*2430

*Department(s):* Department of Molecular and Cellular Biology

### MICR\*3430 Advanced Methods in Microbiology W (1-6) [0.75]

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.

*Prerequisite(s):* MBG\*3080, MICR\*2430

*Co-requisite(s):* MBG\*3350

*Department(s):* Department of Molecular and Cellular Biology

### 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.

*Prerequisite(s):* MBG\*3080, MCB\*2050, MICR\*3230

*Department(s):* Department of Molecular and Cellular Biology

### 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.

*Prerequisite(s):* MBG\*2040, MICR\*2430. (MBG\*3350 is strongly recommended.)

*Department(s):* Department of Molecular and Cellular Biology

### 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.

*Prerequisite(s):* MICR\*3330, (MICR\*2430 is recommended)

*Department(s):* Department of Molecular and Cellular Biology

### MICR\*4430 Medical Virology W (3-0) [0.50]

This course is designed to present an overview of the major viruses causing important diseases in humans. The course focuses on the molecular mechanisms of viral pathogenesis, determinants of viral virulence and the host response to infections. Diagnosis of viral infections, vaccines and controls of viral infections are also discussed. The first part of the course will cover the basic principles and concepts used in the study of viral diseases, modern diagnostic methods and recent advances in the application of molecular virology to the development of recombinant vaccines and other means to combat viral diseases. The second half of the course will include material on the individual diseases and causative viruses.

*Prerequisite(s):* MICR\*3330

*Department(s):* Department of Pathobiology

**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.

*Prerequisite(s):* BIOC\*3560, MBG\*3080

*Department(s):* Department of Molecular and Cellular Biology

**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

*Department(s):* Department of Molecular and Cellular Biology

## Molecular and Cellular Biology

Department of 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

*Department(s):* Department of Molecular and Cellular Biology

### MCB\*3010 Dynamics of Cell Function and Signaling W (3-0) [0.50]

This course examines the dynamic properties of cells as they relate to cell-cell and cell-substrate interactions and elaborates on the fundamentals of intracellular signal transduction during these interactions. Topics will include the function and regulation of signalling modules, the cytoskeleton, and membrane component in the context of cellular interactions with other cells and with the extracellular matrix. These concepts will be integrated to develop a deeper understanding of dynamic cellular function within different tissue environments and physiological settings.

*Prerequisite(s):* BIOC\*3560, MCB\*2050

*Department(s):* Department of Molecular and Cellular Biology

### 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):* MCB\*2050 or MCB\*3010

*Department(s):* Department of Molecular and Cellular Biology

### 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

*Department(s):* Department of Molecular and Cellular Biology

### 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.

*Restriction(s):* Minimum 70% cumulative average in science courses during the first 6 semesters of the relevant majors.

*Restriction(s):* 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.

*Department(s):* Department of Molecular and Cellular Biology

### MCB\*4510 Research Project in Molecular & Cellular Biology 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):* MCB\*4500. 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):* 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.

*Department(s):* Department of Molecular and Cellular Biology

### 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.

*Restriction(s):* Students in programs offering topics courses cannot enroll in MCB\*4600. Coordinator consent required.

*Department(s):* Department of Molecular and Cellular Biology

## Molecular Biology and Genetics

*Department of Animal Biosciences*

*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.

*Restriction(s):* Students in the BAS, BSC and BSC(ENV) program cannot take this course for credit.

*Department(s):* Department of Molecular and Cellular Biology

### 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\*1090

*Department(s):* Department of Molecular and Cellular Biology

### MBG\*2400 Fundamentals of Plant and Animal Genetics F (3-2) [0.50]

Fundamental aspects of plant and animal genetics are covered in this course including the chromosomal basis of inheritance, natural and artificial selection, domestication, epigenetics and quantitative traits. Population dynamics and the effect of selection on allele frequencies will be introduced with examples from agricultural crop and animal species and companion animal species. Genomics will be introduced with an emphasis on the development and use of molecular genetic markers in marker assisted selection.

*Prerequisite(s):* (BIOL\*1050 or BIOL\*1070), BIOL\*1090

*Department(s):* Department of Animal Biosciences

### MBG\*3040 Molecular Biology of the Gene F (3-0) [0.50]

In this course, the structure, expression, control and modification of eukaryotic genes will be discussed with an emphasis on the underlying mechanisms and structure/function relationships. Many topics covered in introductory courses are included but discussed at a more advanced level. Students will have the opportunity to learn current genetic concepts and principles through lectures, as well as the application of this knowledge in the real world through primary literature reading and group research projects.

*Prerequisite(s):* MCB\*2050

*Restriction(s):* MBG\*4080

*Department(s):* Department of Molecular and Cellular Biology

### 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.

*Prerequisite(s):* MCB\*2050

*Department(s):* Department of Molecular and Cellular Biology

### MBG\*3060 Quantitative Genetics W (3-0) [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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* MBG\*2400, 0.50 credits in statistics

*Department(s):* Department of Animal Biosciences

### 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.

*Prerequisite(s):* MBG\*2040, MICR\*2420

*Department(s):* Department of Molecular and Cellular Biology

### MBG\*3100 Plant Genetics W (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.

*Prerequisite(s):* (MBG\*2040 or MBG\*2400 ), STAT\*2040

*Department(s):* Department of Plant Agriculture

### MBG\*3350 Laboratory Methods in Molecular Biology I F,W (1.5-8) [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.

*Prerequisite(s):* BIOC\*2580, MCB\*2050

*Restriction(s):* Registration in BSC.BIOC (major or minor), BIOC:C , BTOX, BTOX:C, BPCH, BPCH:C, MICR(major or minor), MICR:C , MBG (major or minor), PBTC, PLSC (major or minor), TOX, TOX:C

*Department(s):* Department of Molecular and Cellular Biology

### 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 procedures independently, and to diagnose and analyze experimental results obtained with these techniques.

*Prerequisite(s):* 70% in MCB\*2050 and 75% in MBG\*3350

*Department(s):* Department of Molecular and Cellular Biology

### MBG\*3660 Genomics W (3-0) [0.50]

This course examines the genomes of eukaryotes and prokaryotes including 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):* MCB\*2050

*Department(s):* Department of Molecular and Cellular Biology

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

This course explores theoretical and applied aspects of breeding programs for performance, pleasure and hobby animal populations to enhance genetic selection and population viability. Case studies are used to explore the theory and practice of designing practical and sustainable breeding programs that integrate molecular genetics, animal breeding and statistical genomics for a variety of single and multiple birth species.

*Prerequisite(s):* MBG\*3060

*Equate(s):* ANSC\*4020

*Department(s):* Department of Animal Biosciences

### MBG\*4030 Animal Breeding Methods and Applications W (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 will be presented along with applications to livestock and poultry species. This course integrates quantitative genetics with concepts of statistics, economics, biology and biotechnology and expands into development of practical breeding plans.

*Prerequisite(s):* MBG\*3060

*Department(s):* Department of Animal Biosciences

### 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.

*Prerequisite(s):* MBG\*3040

*Department(s):* Department of Molecular and Cellular Biology

### MBG\*4110 Epigenetics 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 chromatic remodeling, gene silencing and RNA interference as they pertain to organism development, with an emphasis on plants.

*Prerequisite(s):* MBG\*3040

*Department(s):* Department of Molecular and Cellular Biology

### MBG\*4160 Plant Breeding F (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.

*Prerequisite(s):* (MBG\*2040 or MBG\*2400), STAT\*2040

*Department(s):* Department of Plant Agriculture

**MBG\*4240 Applied Molecular Genetics in Medicine and Biotechnology W (3-0)  
[0.50]**

This course will examine advanced techniques and methods used in molecular biology, medicine and biotechnology such as genome, transcriptome and proteome analysis, contemporary genetic screens, genetic engineering, transgenic organisms and gene therapy. The course will highlight the most recent developments and applications of such techniques.

*Prerequisite(s):* MBG\*3040

*Department(s):* Department of Molecular and Cellular Biology

**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.

*Prerequisite(s):* MCB\*2050

*Department(s):* Department of Molecular and Cellular Biology

**MBG\*4300 Plant Molecular Genetics F (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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* MBG\*2040 or MBG\*2400

*Department(s):* Department of Plant Agriculture

## 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.*

### MUSC\*1060 Amadeus to Zeppelin: Music and Culture I F,W (3-0) [0.50]

This course explores the place classical music holds in contemporary society, drawing upon texts from popular and cyber culture. Focusing on examples that engage with Western art music from 1100 – 1791 C.E., this course teaches students the skills necessary for media and information literacy while also developing music-historical knowledge and providing foundational training in university-level writing about music. No prior musical training is necessary.

*Restriction(s): MUSC\*2280 , MUSC\*2600 , MUSC\*2610 , MUSC\*2620*

*Department(s): School of Fine Art and Music*

### 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.

*Offering(s): Offered in even-numbered years.*

*Equate(s): PHYS\*1810*

*Restriction(s): Students who have standing in any 1000 level physics course, except PHYS\*1300 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.*

*Department(s): School of Fine Art and Music*

### 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.

*Offering(s): Offered through Distance Education format only.*

*Equate(s): MUSC\*1120*

*Restriction(s): MUSC\*1180*

*Department(s): School of Fine Art and Music*

### MUSC\*1180 Musicianship I F,W (3-0) [0.50]

This course explores the inner workings of music--its harmonic, melodic, and rhythmic building blocks. Through intense exercises that hone skills in ear training, dictation, keyboard, improvisation, and harmonization, students gain a deep understanding of how music works, and acquire practical musical skills that contribute to future work in composition, music theory, (ethno)musicology, pedagogy, and performance. A solid base in rudiments is required for this course, and will be assessed upon registration.

*Restriction(s): This is a Priority Access Course. Some restrictions may apply during some time periods.*

*Department(s): School of Fine Art and Music*

### 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.*

*Department(s): School of Fine Art and Music*

### 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.*

*Department(s): School of Fine Art and Music*

### 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 and beyond including the works of Debussy, Stravinsky, Satie, Schoenberg, Cage, Cowell, and others.

*Offering(s): Offered in even-numbered years.*

*Department(s): School of Fine Art and Music*

### 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.

*Offering(s): Offered in odd-numbered years.*

*Department(s): School of Fine Art and Music*

### 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*

*Department(s): School of Fine Art and Music*

### 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.

*Offering(s): Also offered through Distance Education format.*

*Department(s): School of Fine Art and Music*

### 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.

*Offering(s): Also offered through Distance Education format.*

*Department(s): School of Fine Art and Music*

### MUSC\*2180 Musicianship II F,W (3-0) [0.50]

A continuation of MUSC\*1180.

*Prerequisite(s): MUSC\*1180*

*Department(s): School of Fine Art and Music*

### 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.

*Offering(s): Offered in even-numbered years.*

*Department(s): School of Fine Art and Music*

### 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*

*Department(s): School of Fine Art and Music*

### MUSC\*2330 Beethoven to Broadway: Music and Culture II F (3-0) [0.50]

This course explores the connections between contemporary culture and the history of Western Art Music. Focusing on material from 1750 to 1890, this course considers how cyber and popular culture engage with and often distort the historical origins of "classical" music. Students will further develop media and research literacy skills and will continue to hone their command of writers' craft. The ability to read music is required for this course.

*Prerequisite(s): MUSC\*1060*

*Restriction(s): MUSC\*2600 , MUSC\*2610 , MUSC\*2620*

*Department(s): School of Fine Art and Music*

**MUSC\*2380 Classical Music from Concert Hall to Cinema S (3-0) [0.50]**

This is a music appreciation course intended for non-music majors. This course explores the sonic codes of western art music ("Classical" music) as they developed in their original contexts, as well as their use and meaning in today's film soundtracks. The works chosen for study are those likely to be encountered in modern concert and opera halls and are selected primarily from the Baroque, Classical, and Romantic eras.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 2.00 credits

*Restriction(s):* MUSC\*1060, Not available to students registered in a Music specialization.

*Department(s):* School of Fine Art and Music

**MUSC\*2410 Applied Composition I F (3-0) [0.50]**

This course offers class instruction in the technical and aesthetic aspects of music composition.

*Prerequisite(s):* MUSC\*2180

*Restriction(s):* Registration in a Music Program (Honours major or minor, General).

*Department(s):* School of Fine Art and Music

**MUSC\*2420 Applied Composition II W (3-0) [0.50]**

This course is a continuation of MUSC\*2410.

*Prerequisite(s):* A minimum grade of 70% in MUSC\*2410.

*Restriction(s):* Registration in a Music Program (Honours major or minor, General).

*Department(s):* School of Fine Art and Music

**MUSC\*2500 Applied Music III S,F,W (1-6) [0.50]**

A continuation of MUSC\*1510.

*Prerequisite(s):* (MUSC\*1180 or MUSC\*2180), a minimum grade of 70% in MUSC\*1510. (MUSC\*1180 or MUSC\*2180 may be taken as corequisite)

*Restriction(s):* Registration in a Music specialization.

*Department(s):* School of Fine Art and Music

**MUSC\*2510 Applied Music IV S,F,W (1-6) [0.50]**

A continuation of MUSC\*2500.

*Prerequisite(s):* A minimum grade of 70% in MUSC\*2500

*Restriction(s):* Registration in a Music specialization.

*Department(s):* School of Fine Art and Music

**MUSC\*2530 Instrumental Ensembles I F,W (0-2) [0.25]**

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.

*Restriction(s):* Instructor consent required. Successful completion of an audition.

*Department(s):* School of Fine Art and Music

**MUSC\*2540 Instrumental Ensembles II F,W (0-2) [0.25]**

A continuation of MUSC\*2530.

*Prerequisite(s):* MUSC\*2530

*Restriction(s):* Instructor consent required.

*Department(s):* School of Fine Art and Music

**MUSC\*2550 Choral Ensembles I F,W (0-2) [0.25]**

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.

*Equate(s):* MUSC\*2520

*Restriction(s):* Instructor consent required. Successful completion of an audition.

*Department(s):* School of Fine Art and Music

**MUSC\*2560 Choral Ensembles II F,W (0-2) [0.25]**

A continuation of MUSC\*2550.

*Prerequisite(s):* MUSC\*2550

*Equate(s):* MUSC\*2520

*Restriction(s):* Instructor consent required.

*Department(s):* School of Fine Art and Music

**MUSC\*2570 Keyboard Accompaniment I F,W (0-2) [0.25]**

Development of sight-reading and accompaniment skills for pianists in close coordination with vocal and instrumental applied music students.

*Prerequisite(s):* MUSC\*2510 on piano.

*Restriction(s):* Instructor consent required.

*Department(s):* School of Fine Art and Music

**MUSC\*2580 Keyboard Accompaniment II F,W (0-2) [0.25]**

A continuation of MUSC\*2570.

*Prerequisite(s):* MUSC\*2570

*Department(s):* School of Fine Art and Music

**MUSC\*2660 Materials of Music I F (3-0) [0.50]**

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.

*Prerequisite(s):* MUSC\*1180

*Co-requisite(s):* MUSC\*2180

*Restriction(s):* MUSC\*1250 , MUSC\*2360

*Department(s):* School of Fine Art and Music

**MUSC\*3010 Materials of Music II W (3-0) [0.50]**

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.

*Prerequisite(s):* MUSC\*2180, MUSC\*2660

*Restriction(s):* MUSC\*2360 , MUSC\*2370 , MUSC\*2670

*Department(s):* School of Fine Art and Music

**MUSC\*3150 Music in London F (3-0) [0.50]**

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.

*Restriction(s):* Admission to the London Semester.

*Department(s):* School of Fine Art and Music

**MUSC\*3410 Applied Composition III E,W (1-6) [0.50]**

This course is a continuation of MUSC\*2420.

*Prerequisite(s):* A minimum grade of 70% in MUSC\*2420 and (2 of MUSC\*2530, MUSC\*2540, MUSC\*2550, MUSC\*2560).

*Restriction(s):* Registration in a Music Program (Honours major or minor, General).

*Department(s):* School of Fine Art and Music

**MUSC\*3420 Applied Composition IV E,W (1-6) [0.50]**

This course is a continuation of MUSC\*3410.

*Prerequisite(s):* A minimum grade of 70% in MUSC\*3410.

*Restriction(s):* Registration in a Music Program (Honours major or minor, General).

*Department(s):* School of Fine Art and Music

**MUSC\*3500 Applied Music V S,F,W (1-6) [0.50]**

A continuation of MUSC\*2510.

*Prerequisite(s):* 3.00 credits in music courses including a minimum grade of 70% in MUSC\*2510, (MUSC\*2540 or MUSC\*2560).

*Restriction(s):* Registration in a Music Program (Honours major or minor, General, Area of Concentration).

*Department(s):* School of Fine Art and Music

**MUSC\*3510 Applied Music VI S,F,W (1-6) [0.50]**

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).

*Prerequisite(s):* 4.00 credits in music courses including a minimum grade of 70% in MUSC\*3500

*Restriction(s):* Registration in a Music Program (Honours major or minor, General, Area of Concentration).

*Department(s):* School of Fine Art and Music

**MUSC\*3550 Advanced Music Ensemble I F,W (0-3) [0.25]**

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.

*Prerequisite(s):* MUSC\*2500, (2 of MUSC\*2530, MUSC\*2540, MUSC\*2550, MUSC\*2560)

*Restriction(s):* Registration in a Music Program (Honours major or minor, General, Area of Concentration). Instructor consent required.

*Department(s):* School of Fine Art and Music

**MUSC\*3560 Advanced Music Ensemble II F,W (0-3) [0.25]**

A continuation of MUSC\*3550.

*Prerequisite(s):* MUSC\*3550

*Restriction(s):* Instructor consent required.

*Department(s):* School of Fine Art and Music

**MUSC\*3630 Tragedy, Technology, and Torture: Music Post 1900 W (3-0) [0.50]**

This course examines music from the late 19th century (Debussy and post-romantic composers) to the present from both historical and theoretical perspectives.

*Prerequisite(s):* MUSC\*2660, (MUSC\*2330 or MUSC\*2620 )

*Co-requisite(s):* MUSC\*3010

*Department(s):* School of Fine Art and Music

**The following topics courses normally focus on current areas of faculty research. It is expected that students will have completed at least 7.50 credits before taking these upper-level courses.**

**MUSC\*3730 Topics in Jazz and Improvised Music F (3-0) [1.00]**

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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 7.50 credits including MUSC\*2140

*Department(s):* School of Fine Art and Music

**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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 7.50 credits including ( MUSC\*1180 or MUSC\*2180), MUSC\*2150

*Department(s):* School of Fine Art and Music

**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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 7.50 credits including ( MUSC\*2670 or MUSC\*3010), MUSC\*3630

*Department(s):* School of Fine Art and Music

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 7.50 credits including ( MUSC\*1180 or MUSC\*2180), MUSC\*2270

*Department(s):* School of Fine Art and Music

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 7.50 credits including MUSC\*2100

*Restriction(s):* Instructor consent required.

*Department(s):* School of Fine Art and Music

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 7.50 credits including MUSC\*2180, MUSC\*2660

*Department(s):* School of Fine Art and Music

**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, including (1 of MUSC\*3730, MUSC\*3740, MUSC\*3800, MUSC\*3820, MUSC\*3860, MUSC\*3880)

*Restriction(s):* Instructor consent required. Registration in an honours major or minor in music or an area of concentration (General Program) in Music.

*Department(s):* School of Fine Art and 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.

*Department(s):* School of Fine Art and Music

**MUSC\*4460 Honours Music Recital Preparation S,F,W (1-6) [0.50]**

First part of a two-semester performance project culminating in a music recital at the end of the second semester. Students will present a preparatory performance at the end of the first semester. 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. MUSC\*4460 and MUSC\*4470 are normally taken over consecutive semesters.

*Prerequisite(s):* Completion of the music core, a minimum grade of 70% in MUSC\*3510

*Equate(s):* MUSC\*4401

*Restriction(s):* Permission of the School and registration in an honours major in music.

*Department(s):* School of Fine Art and Music

**MUSC\*4470 Honours Music Recital S,F,W (1-6) [0.50]**

Second part of a two-semester performance project culminating in a music recital at the end of the second semester. MUSC\*4460 and MUSC\*4470 are normally taken over consecutive semesters.

*Prerequisite(s):* A minimum grade of 70% in MUSC\*4460

*Equate(s):* MUSC\*4402

*Restriction(s):* Registration in an honours major in music.

*Department(s):* School of Fine Art and Music

## 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.

*Department(s):* Department of Chemistry

### **NANO\*2000 Synthesis and Characterization of Nanomaterials I F (3-3) [0.50]**

This course explores the structural, mechanical, and electronic properties of matter. Methods to fabricate nanostructured materials such as nanoparticles, nanocomposites, thin films, polymers, and ferrofluids will be discussed. Techniques that have been developed to analyze these materials are also discussed, including scattering, microscopy and spectroscopy.

*Prerequisite(s):* CHEM\*1050, [IPS\*1510 or ( MATH\*1210, PHYS\*1010)]

*Restriction(s):* Registration in Nanoscience Major.

*Department(s):* Department of Chemistry

### **NANO\*2100 Synthesis and Characterization of Nanomaterials II W (3-3) [0.50]**

The structural, mechanical, and electronic properties of matter will be discussed. Topics will include methods to fabricate nanostructured materials such as nanoparticles, nanocomposites, thin films, polymers and ferrofluids, as well as techniques that have been developed to analyze these materials, including scattering, microscopy and spectroscopy

*Prerequisite(s):* NANO\*2000

*Department(s):* Department of Physics

### **NANO\*3200 Nanolithographic Techniques F (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

*Department(s):* Department of Chemistry

### **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)

*Department(s):* Department of Chemistry

### **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

*Department(s):* Department of Physics

### **NANO\*3600 Computational Methods in Materials Science W (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\*1160 or MATH\*2160), ( MATH\*2170 or MATH\*2270), (CHEM\*3860 or PHYS\*3230)

*Department(s):* Department of Physics

### **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):* MATH\*2270, (CHEM\*2820 or PHYS\*2240)

*Department(s):* Department of Physics

### **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)

*Department(s):* Department of Chemistry

### **NANO\*4700 Concepts in Quantum Computing F (3-0) [0.50]**

This course introduces concepts in quantum computation and quantum information. Following an introduction to the basics of linear algebra, quantum mechanics, and computer science, presented from the viewpoint of quantum information theory, topics covered will include quantum computation, quantum algorithms, quantum error correction, quantum cryptography and quantum communication.

*Prerequisite(s):* MATH\*1160, (CHEM\*3860 or PHYS\*3230)

*Restriction(s):* NANO\*3500

*Department(s):* Department of Chemistry

### **NANO\*4900 Advanced Studies in Nanoscience W (1-5) [0.50]**

This course will guide students through the primary literature of the field with readings from recent achievements. Students will select individual topics on which they will prepare seminars and written reports.

*Prerequisite(s):* 1.50 credits in NANO courses at the 3000 level.

*Restriction(s):* PHYS\*4300

*Department(s):* Department of Physics

### **NANO\*4910 Nanoscience Research Project I S,F,W (0-12) [1.00]**

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.

*Department(s):* Department of Chemistry

### **NANO\*4920 Nanoscience Research Project II S,F,W (0-12) [1.00]**

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):* NANO\*4910

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Chemistry

## Neuroscience

### NEUR\*2000 Introduction to Neuroscience F (3-0) [0.50]

This course offers an introduction to the mammalian nervous system, with emphasis on the structure and function of the human brain. General principles of the function and organization of nervous systems will be discussed, providing both an overview of the subject and a foundation for advanced courses. Topics will include the physical and chemical bases for action potentials, synaptic transmission, and sensory transduction; anatomy; development; sensory and motor pathways; and the neuroscience of brain diseases.

*Prerequisite(s):* BIOL\*1090, PSYC\*1000

*Restriction(s):* PSYC\*2410. This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods.

*Department(s):* Department of Psychology

### NEUR\*3100 Molecular Biology of Neurodevelopmental and Degenerative Disease F (3-0) [0.50]

This course will follow the life of nervous system cells from birth, through their functional life, and ending in ageing and degenerative disease. Focus will be on the molecular and cellular events that govern these processes and the diseases and pathologies, such as Parkinson's and Alzheimer's, that arise as a consequence of their dysfunction. Finally, students will be introduced to the new and rapidly advancing field of adult neural stem cells and the promises and potential problems of their use in treating many of the diseases that will have been discussed throughout.

*Prerequisite(s):* MCB\*2050, (NEUR\*2000 or PSYC\*2410)

*Restriction(s):* This is a Priority Access Course. Enrolment may be restricted to particular programs (BSCH.NEUR, NEUR minor) or semester levels during certain periods.

*Department(s):* Department of Molecular and Cellular Biology

### NEUR\*3500 Techniques in Neuroscience W (2-3) [0.50]

This course provides an introduction to selected techniques used in Neuroscience. Students will investigate and learn key methods in neurophysiology and biomechanics, neuroanatomy, cognitive neuroscience, and molecular and cellular neurobiology, used to address contemporary problems in this multidisciplinary field. These techniques will be introduced through literature review, hands-on laboratory exercises and demonstrations. A diversity of vertebrate and invertebrate model organisms will be considered as well as the ethical considerations that accompany the use of animals or human subjects in research.

*Prerequisite(s):* (NEUR\*2000 or PSYC\*2410), PSYC\*3270

*Restriction(s):* This is a Priority Access Course. Enrolment may be restricted to particular programs (BSCH.NEUR) or semester levels during certain periods.

*Department(s):* Department of Molecular and Cellular Biology, Department of Biomedical Sciences, Department of Psychology, Department of Human Health and Nutritional Sciences

### 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):* 14.00 credits

*Restriction(s):* Enrolment restricted to BSC.NEUR major and minor.

*Department(s):* Department of Biomedical Sciences

### NEUR\*4100 Neuropharmacology F (4-0) [0.50]

This course will explore pharmacological manipulation of the nervous system. Content will focus on the physiology of major neurotransmitter systems in the brain, followed by current pharmacological interventions for selected brain disorders, and the use and abuse of common pharmacological agents.

*Offering(s):* First offering - Fall 2019

*Prerequisite(s):* BIOM\*3090, (NEUR\*2000 or PSYC\*2410)

*Restriction(s):* This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods.: (e.g. BSC.NEUR major, minor, and BSC.BIOM)

*Department(s):* Department of Biomedical Sciences

### 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.

*Prerequisite(s):* 14.00 credits

*Restriction(s):* BIOM\*4510, BIOM\*4521/2, NEUR\*4450. Instructor consent required. Enrolment restricted to BSC.NEUR major and minor.

*Department(s):* Department of Biomedical Sciences

### NEUR\*4401/2 Research in Neurosciences S,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.

*Prerequisite(s):* 14.00 credits

*Restriction(s):* BIOM\*4510, BIOM\*4521/2, NEUR\*4450. Instructor consent required. Enrolment restricted to BSC.NEUR major and minor.

*Department(s):* Department of Biomedical Sciences

### 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.

*Prerequisite(s):* NEUR\*4401

*Restriction(s):* BIOM\*4510, BIOM\*4521/2, NEUR\*4450. Enrolment restricted to BSC.NEUR major and minor.

*Department(s):* Department of Biomedical Sciences

### 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.

*Prerequisite(s):* 14.00 credits

*Restriction(s):* BIOM\*4510, BIOM\*4521/2, NEUR\*4401/2. Instructor consent required. Enrolment restricted to BSC.NEUR major and minor.

*Department(s):* Department of Biomedical Sciences

## Nutrition

*Department of Animal Biosciences*

*Department of Family Relations and Applied Nutrition*

*Department of Human Health and Nutritional Sciences*

### NUTR\*1010 Introduction to Nutrition F,W (3-0) [0.50]

This course is an introduction to human nutrition, with major emphasis on nutrients and their dietary sources, functions, and relationships to health. Topics will include the energy-containing nutrients, selected vitamins and minerals and weight management. We will also explore current popular topics and emerging diet-disease relationships.

*Offering(s):* 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.

*Department(s):* Department of Family Relations and Applied Nutrition

### NUTR\*2050 Nutrition Through the Life Cycle F (3-0) [0.50]

This course explores how individual, family, community and societal factors influence nutritional needs and dietary intake from infancy through older adulthood. Implications for nutrition care and community-level programs are discussed.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* NUTR\*1010

*Department(s):* Department of Family Relations and Applied Nutrition

### 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. (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.

*Department(s):* Department of Food Science

### 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.

*Prerequisite(s):* FRHD\*3070, NUTR\*2050

*Restriction(s):* Registration in the B.A.Sc. program.

*Department(s):* Department of Family Relations and Applied Nutrition

### 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.

*Prerequisite(s):* ( BIOM\*2000 or BIOM\*3200), 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.

*Department(s):* Department of Family Relations and Applied Nutrition

### 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.

*Prerequisite(s):* 9.50 credits including NUTR\*2050

*Restriction(s):* Registration is limited to students registered in the B.A.Sc. AHN major.

*Department(s):* Department of Family Relations and Applied Nutrition

### 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.

*Prerequisite(s):* 1 of NUTR\*1010, NUTR\*2150, NUTR\*3210

*Restriction(s):* NUTR\*2070

*Department(s):* Department of Family Relations and Applied Nutrition

### NUTR\*3210 Fundamentals of Nutrition S,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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* BIOC\*2580

*Department(s):* Department of Human Health and Nutritional Sciences

### 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.

*Prerequisite(s):* NUTR\*3210

*Department(s):* Department of Human Health and Nutritional Sciences

### NUTR\*3360 Lifestyle Genomics F (3-0) [0.50]

This course explores how genes and lifestyle choices (in particular diet and exercise) interact to affect cell and tissue function, and impact human health. These concepts will be examined through in-depth discussions of common metabolic diseases. The course is designed to highlight the integrative and inter-connected cellular, molecular, and physiological mechanisms underlying these conditions.

*Prerequisite(s):* BIOC\*2580, BIOL\*1080, MBG\*2040

*Restriction(s):* NUTR\*4350

*Department(s):* Department of Human Health and Nutritional Sciences

### 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.

*Prerequisite(s):* NUTR\*3210

*Restriction(s):* Registration in the B.Sc. NANS major or minor and the B.Sc. FFAN minor.

*Department(s):* Department of Human Health and Nutritional Sciences

### NUTR\*4010 Nutritional Assessment F (3-0) [0.50]

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. Significant independent learning will be required.

*Prerequisite(s):* 14.50 credits including NUTR\*2050, NUTR\*3210

*Restriction(s):* Registration in the B.A.Sc. AHN major.

*Department(s):* Department of Family Relations and Applied Nutrition

### NUTR\*4040 Clinical Nutrition II F (3-0) [0.50]

This course is a continuation of NUTR\*3090. This lecture based course is concerned with the application of nutrition to clinical conditions. 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.

*Prerequisite(s):* 14.50 credits including, [1 of BIOM\*2000, ( BIOM\*3100 or BIOM\*3110 ), BIOM\*3200], ( NUTR\*3040 or NUTR\*3090 )

*Restriction(s):* Registration in the B.A.Sc. AHN major.

*Department(s):* Department of Family Relations and Applied Nutrition

### 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.

*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 Studies minor during certain time periods.

*Department(s):* Department of Family Relations and Applied Nutrition

**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. (Also listed as FOOD\*4090.)

*Prerequisite(s):* NUTR\*3210

*Equate(s):* FOOD\*4090

*Department(s):* Department of Human Health and Nutritional Sciences, Department of Food Science

**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.

*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.

*Department(s):* Department of Family Relations and Applied Nutrition

**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.

*Prerequisite(s):* NUTR\*3210, (1 of BIOM\*3200, HK\*3810, HK\*3940 )

*Department(s):* Department of Human Health and Nutritional Sciences

**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.

*Prerequisite(s):* NUTR\*3210, (1 of BIOM\*3200, HK\*3810, HK\*3940 , ZOO\*3210 , ZOO\*3620)

*Department(s):* Department of Human Health and Nutritional Sciences

**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.

*Prerequisite(s):* NUTR\*3330, NUTR\*3390, (HK\*3810 or HK\*3940 )

*Restriction(s):* Registration in B.Sc. NANS major or minor.

*Department(s):* Department of Human Health and Nutritional Sciences

**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.

*Prerequisite(s):* NUTR\*3210, (1 of BIOM\*3200, HK\*3810, HK\*3940 )

*Department(s):* Department of Human Health and Nutritional Sciences

**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.

*Prerequisite(s):* NUTR\*3210

*Department(s):* Department of Human Health and Nutritional Sciences

**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.

*Prerequisite(s):* FRHD\*3070, NUTR\*2050, ( NUTR\*3040 or NUTR\*3090 )

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Family Relations and Applied Nutrition

**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.

*Prerequisite(s):* FRHD\*3400, NUTR\*4040, NUTR\*4070

*Restriction(s):* NUTR\*4120 Instructor consent required.

*Department(s):* Department of Family Relations and Applied Nutrition

**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.

*Prerequisite(s):* FRHD\*3070, ( NUTR\*3040 or NUTR\*3090 ), NUTR\*4010

*Restriction(s):* Registration in B.A.Sc. AHN major.

*Department(s):* Department of Family Relations and Applied Nutrition

**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

*Department(s):* Department of Family Relations and Applied Nutrition

## Organic Agriculture

**OAGR\*2070 Introduction to Organic Agriculture W (3-3) [1.00]**

Students will be exposed to the scale of the organic industry today, including the factors driving interest in organics for both producers and consumers. The foundational principles underlying contemporary organic agriculture will be presented and first hand experience of current organic practices will be provided. In addition, this course will rely on small group mentoring to stimulate independent, learner-centered analysis of selected topics in organic agriculture.

*Prerequisite(s):* 5.00 credits

*Restriction(s):* OAGR\*2050 , OAGR\*3030

*Department(s):* Department of Plant Agriculture, School of Environmental Sciences

**OAGR\*4050 Design of Organic Production Systems F (6-0) [1.00]**

Students will apply organic agriculture principles to the design and concept of agricultural operations, taking into account the interactions of soils, plants and animals with environmental and managerial factors.

*Prerequisite(s):* OAGR\*2070

*Restriction(s):* OAGR\*3130 , OAGR\*4160

*Department(s):* Department of Plant Agriculture, School of Environmental Sciences

**OAGR\*4180 Social Issues in Organic Agriculture W (2-2) [0.50]**

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.

*Prerequisite(s):* 1 of EDRD\*3400, OAGR\*2070, SOC\*2080

*Department(s):* School of Environmental Design and Rural Development

## 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.

*Department(s):* Department of Pathobiology

### **PATH\*3610 Principles of Disease S,F,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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 1.50 credits in biology

*Restriction(s):* PATH\*3600

*Department(s):* Department of Pathobiology

### **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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* PATH\*3610

*Department(s):* Department of Pathobiology

## **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 2.00 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\*4230, 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 Classic Thinkers F (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.

*Department(s):* Department of 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.

*Department(s):* Department of Philosophy

### PHIL\*1030 Sex, Love, and Friendship F,W (3-0) [0.50]

This course introduces students to philosophical inquiry through the careful study of the forms of interpersonal relationships. Issues central to friendship, love, and sexuality which may be addressed include pleasure, happiness, responsibility, power, and oppression, gender, marriage and morality.

*Department(s):* Department of Philosophy

### PHIL\*1050 Ethics, Knowledge, and Reality 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.

*Department(s):* Department of Philosophy

### PHIL\*2000 Philosophy of Biology W (3-0) [0.50]

This course focuses on philosophical issues that arise within biology, such as the explanation of altruism, the question of whether species are real, and the challenge of how to identify adaptations. The course also examines philosophical issues that arise at the interface between biology and society, such as the implications of evolutionary theory for traditional views about human nature, or the proper role for scientists in advocating for environmental policies.

*Prerequisite(s):* 2.00 credits including 0.50 credits in BIOL

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* Department of Philosophy

### PHIL\*2030 Philosophy of Medicine 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)

*Department(s):* Department of Philosophy

### 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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1050)

*Department(s):* Department of Philosophy

### 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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1050)

*Department(s):* Department of Philosophy

### 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)

*Department(s):* Department of Philosophy

### PHIL\*2110 Formal 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)

*Department(s):* Department of Philosophy

### 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?

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1050)

*Department(s):* Department of Philosophy

### PHIL\*2140 Ancient Greek 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, and Epictetus, although the specific course content will vary with the instructor.

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1030, PHIL\*1050)

*Department(s):* Department of Philosophy

### PHIL\*2160 Early Modern Philosophy: Reason vs. Experience W (3-0) [0.50]

Philosophers of the seventeenth and eighteenth centuries grappled with a central question regarding the foundation of human knowledge: Does knowledge arise from pure reasoning alone or from sensory experience? This question inspired debates regarding scepticism, the nature of reality, the connection between mind and body, language and meaning, moral certainty, and the relationship between religion and science, to name but a few.

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1030, PHIL\*1050)

*Department(s):* Department of Philosophy

**PHIL\*2170 Existentialism F (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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1050)

*Department(s):* Department of Philosophy

**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)

*Department(s):* Department of Philosophy

**PHIL\*2240 Knowledge and Belief F (3-0) [0.50]**

This course is an introduction to epistemology, which is the study of the nature, scope, and limits of knowledge. This course will examine a number of the central questions in epistemology, such as: what can we know? What is the nature of knowledge? And what is the difference between knowledge and true belief?

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1030, PHIL\*1050)

*Equate(s):* PHIL\*2250

*Department(s):* Department of Philosophy

**PHIL\*2280 Key Concepts in Political Philosophy F (3-0) [0.50]**

This course presents an in-depth treatment of one or more key concepts in political philosophy. Among the many possible concepts that the course may address are those of freedom, equality, power, community, identity, autonomy, justice, rights, political obligation, representation, authority, legitimacy, exploitation, emancipation, and development. These concepts may be explored historically or through contemporary political and/or philosophical debates.

*Prerequisite(s):* 0.50 credits in either Philosophy or Political Science

*Restriction(s):* POLS\*2000

*Department(s):* Department of Philosophy

**PHIL\*2370 Metaphysics and Mind W (3-0) [0.50]**

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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1030, PHIL\*1050)

*Department(s):* Department of Philosophy

**PHIL\*2600 Business and Professional Ethics W (3-0) [0.50]**

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.

*Prerequisite(s):* 2.00 credits or (1 of PHIL\*1000, PHIL\*1010, PHIL\*1050)

*Department(s):* Department of Philosophy

**PHIL\*3040 Philosophy of Law F (3-0) [0.50]**

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.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits or PHIL\*2120

*Department(s):* Department of Philosophy

**PHIL\*3050 Philosophy of Art W (3-0) [0.50]**

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.

*Offering(s):* Also offered through Distance Education format. Offered in even-numbered years.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Department(s):* Department of Philosophy

**PHIL\*3060 Medieval Philosophy W (3-0) [0.50]**

An overview of philosophical thought of the Middle Ages, that is, roughly of the period between 500 AD and 1500 AD. The course will focus on several themes from the Christian, Jewish and Islamic traditions to show that many of the philosophical concerns of the present day were also of concern to thinkers of the period. In particular, we will look at the relationship between knowledge and belief, the nature of human happiness, the question of whether God exists and, if so, whether his existence can be rationally demonstrated, and the problem of free will, among others. Thinkers to be discussed will generally include St. Augustine (354-430), St. Anselm (1033-1109), al-Farabi (ca. 850-ca. 950), Maimonides (1135-1204) and St. Thomas Aquinas (1224/25-1274).

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Department(s):* Department of Philosophy

**PHIL\*3100 Kant and His Legacy W (3-0) [0.50]**

This course offers an in-depth study of the philosophy of Immanuel Kant, one of the most influential figures in the history of philosophy. The course will include study of one or more of his major works. Kant's works may be studied on their own, or in conjunction with the study of works of later philosophers who were significantly influenced by Kant's philosophical ideas.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Restriction(s):* PHIL\*3080 , PHIL\*3090

*Department(s):* Department of Philosophy

**PHIL\*3160 Metaphysics W (3-0) [0.50]**

A common way of thinking of the world is that it consists of objects with properties that persist through time while changing in different ways. Yet there are deep puzzles about each of these basic, seemingly indispensable concepts. What does it take to be an object? How much can an object change without becoming a different object? Are some of an object's properties essential to it? Metaphysics is the business of proposing and debating answers to these questions and related questions. This course introduces students to these debates.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Department(s):* Department of Philosophy

**PHIL\*3170 Topics in the Philosophy of Science W (3-0) [0.50]**

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.

*Prerequisite(s):* 1 of (1.50 credits in Philosophy, 7.50 credits, PHIL\*2180)

*Department(s):* Department of Philosophy

**PHIL\*3180 Philosophy of Mind F (3-0) [0.50]**

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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Department(s):* Department of Philosophy

**PHIL\*3190 Epistemology F (3-0) [0.50]**

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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Department(s):* Department of Philosophy

**PHIL\*3200 Continental Philosophy F (3-0) [0.50]**

This course focuses on 20<sup>th</sup> century French and German philosophy and the influences that shaped it. The course will be part historical, part contemporary. The historical part may survey touchstones of current Continental thought in ancient and modern philosophy. The contemporary part of this course may focus on any of the hundred or so key figures in 20<sup>th</sup> or 21<sup>st</sup> century Continental thought, or groupings thereof according to particular thematic.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Department(s):* Department of Philosophy

**PHIL\*3210 Women in the History of Philosophy F (3-0) [0.50]**

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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Department(s):* Department of Philosophy

**PHIL\*3230 Theories of Justice W (3-0) [0.50]**

This is a course in social and political philosophy in 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.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Department(s):* Department of Philosophy

**PHIL\*3250 Philosophy of Language F (3-0) [0.50]**

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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Department(s):* Department of Philosophy

**PHIL\*3260 Set Theory and Modal Logic U (3-0) [0.50]**

Both set theory and modal logic are important tools in contemporary philosophy. Set theory is about relationships among collections of things. Modal logic elaborates the notions of necessity and possibility in formal models of different possible worlds. Students will explore these topics by producing and understanding informal proofs of important facts, and by doing exercises developing understanding of the semantics of modal logic.

*Prerequisite(s):* PHIL\*2110

*Restriction(s):* PHIL\*4110

*Department(s):* Department of Philosophy

**PHIL\*3280 21st Century Philosophy F (3-0) [0.50]**

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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Department(s):* Department of Philosophy

**PHIL\*3290 Advanced Ethical Theory F (3-0) [0.50]**

This course focuses on the theoretical foundations of morality. Ethical theory comprises metaethics, which is primarily concerned with the objectivity of moral judgments; normative ethics, which is concerned with the principles of sound moral judgment, and moral psychology, which is concerned with moral motivation and moral reasoning.

*Offering(s):* First offering - Fall 2018

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Department(s):* Department of Philosophy

**PHIL\*3300 Democracy and Its Critics F (3-0) [0.50]**

This course will review classical and contemporary positions on the nature and value of democracy, including arguments for and against it from a variety of stances in political philosophy. It will also examine the merits of competing models of democracy, issues dealing with limitations on majority rule in pluralistic societies, and the applicability of democracy in international contexts.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Department(s):* Department of Philosophy

**PHIL\*3350 Selected Topics in Philosophy 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. Students are encouraged to consult the departmental website for course content and availability.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Department(s):* Department of Philosophy

**PHIL\*3360 Nineteenth Century Philosophy F (3-0) [0.50]**

This course provides a survey of 19th century philosophy, a period of extreme change and upheaval, championed mainly by German thinkers. The course will engage with topics such as the nature of individual freedom; historical approaches to understanding concepts of reality and moral norms; proposed radical revisions to traditional moral and social order; and confronting the possible meaninglessness or absurdity of human life.

*Offering(s):* First offering - Fall 2018 Offered in even-numbered years.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Restriction(s):* PHIL\*3080 , PHIL\*3090

*Department(s):* Department of Philosophy

**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.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Department(s):* Department of Philosophy

**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 or 7.50 credits. PHIL\*2120, PHIL\*2180 are recommended.

*Department(s):* Department of Philosophy

**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.

*Department(s):* Department of Philosophy

**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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Department(s):* Department of Philosophy

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 1.50 credits in Philosophy or 7.50 credits

*Department(s):* Department of Philosophy

**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  
*Department(s):* Department of Philosophy

**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.

*Prerequisite(s):* 1.00 credits in Philosophy at the 3000 level or PHIL\*2060  
*Department(s):* Department of Philosophy

**PHIL\*4120 Current Debates in Language and Mind U (3-0) [0.50]**

Each offering of this course will focus on a specific issue or set of related issues that are now being debated in Philosophy of mind and Philosophy of language. Readings will be contemporary works.

*Prerequisite(s):* 1.00 credits in Philosophy at the 3000 level or 12.50 credits  
*Department(s):* Department of Philosophy

**PHIL\*4130 Current Debates in Continental Philosophy U (3-0) [0.50]**

Each offering of this course will focus on close study of either one or two figures of contemporary relevance in discussions of Continental European philosophy, or a specific issue or set of related issues that are now being debated in that field.

*Prerequisite(s):* 1.00 credits in Philosophy at the 3000 level or 12.50 credits  
*Department(s):* Department of Philosophy

**PHIL\*4140 Current Debates in Philosophy of Science U (3-0) [0.50]**

Each offering of this course will focus on a specific issue or set of related issues that are now being debated in Philosophy of Science. Readings will be contemporary works.

*Prerequisite(s):* 1.00 credits in Philosophy at the 3000 level or 12.50 credits  
*Department(s):* Department of Philosophy

**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.

*Offering(s):* Offered in even-numbered years.  
*Prerequisite(s):* 13.00 credits and a minimum cumulative average of 70%.  
*Restriction(s):* Restricted to students in Philosophy major or minor. Instructor consent required.  
*Department(s):* Department of Philosophy

**PHIL\*4230 Current Debates in 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):* 1.00 credits in Philosophy at the 3000 level or 12.50 credits  
*Department(s):* Department of Philosophy

**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.

*Department(s):* Department of Philosophy

**PHIL\*4340 Current Debates in 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.

*Prerequisite(s):* 1.00 credits in Philosophy at the 3000 level or 12.50 credits  
*Department(s):* Department of Philosophy

**PHIL\*4360 Current Debates in Epistemology 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):* 1 of (1.00 credits in Philosophy at the 3000 level, 12.50 credits, PHIL\*3190)  
*Department(s):* Department of Philosophy

**PHIL\*4370 Current Debates in 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 or 12.50 credits  
*Department(s):* Department of Philosophy

**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  
*Department(s):* Department of Philosophy

**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  
*Department(s):* Department of Philosophy

**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.  
*Department(s):* Department of Philosophy

**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.  
*Department(s):* Department of Philosophy

**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.  
*Department(s):* Department of Philosophy

**PHIL\*4820 Philosophy Research Presentation F,W (3-0) [0.50]**

The focus of this course is mastering the oral presentation of a philosophical argument, and engaging in respectful, intellectually honest discussion with one's audience. Students will develop and present a philosophical claim which they will explain and defend during a question period after the presentation. Students are expected to have topic for their presentation at the beginning of the course.

*Prerequisite(s):* 14.00 credits including 1.00 credits in Philosophy at the 3000-level  
*Restriction(s):* Restricted to students in Philosophy major.  
*Department(s):* Department of Philosophy

# Physics

## Department of Physics

### **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.

**Prerequisite(s):** (1 of IPS\*1500, MATH\*1080, MATH\*1200), (1 of 4U Physics, PHYS\*1020 , PHYS\*1300)

**Restriction(s):** IPS\*1510

**Department(s):** Department of Physics

### **PHYS\*1070 Physics for Life Sciences II W (3-3) [0.50]**

This course discusses 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):** (4U Physics or PHYS\*1020 ), 4U Mathematics

**Restriction(s):** IPS\*1510, PHYS\*1130, PHYS\*1300. 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.

**Department(s):** Department of Physics

### **PHYS\*1080 Physics for Life Sciences F,W (3-3) [0.50]**

This course discusses aspects of classical physics with particular emphasis on topics of importance 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, PHYS\*1020 , PHYS\*1300 ), 4U Mathematics

**Restriction(s):** IPS\*1500, PHYS\*1000 . 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.

**Department(s):** Department of Physics

### **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):** (1 of IPS\*1500, MATH\*1080, MATH\*1200), (1 of 4U Physics, Grade 12 Physics, PHYS\*1020 )

**Restriction(s):** IPS\*1510, PHYS\*1070

**Department(s):** Department of Physics

### **PHYS\*1300 Fundamentals of Physics F (3-3) [0.50]**

This course introduces students to fundamental phenomena in physics, with particular emphasis on applications to the biological sciences. Topics include: analyzing one-dimensional and two-dimensional motion; Newton's laws; momentum, energy and associated conservation laws; interactions between charges, resistive direct-current circuits; the fundamentals of waves, with applications to acoustics; ionizing radiation, radioactivity and medical applications. This course is designed for students who have not completed 4U Physics (or equivalent); students with credit in 4U Physics (or equivalent) may not take this course for credit.

**Restriction(s):** SPH 4U (or equivalent) PHYS\*1020 PHYS\*1070. 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.

**Department(s):** Department of Physics

### **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.

**Offering(s):** Offered through Distance Education format only.

**Restriction(s):** Students with standing in any other 1000 level course credit in physics (except ( PHYS\*1020 or PHYS\*1300), PHYS\*1810)) may not use this course for credit. B.Sc. students may not take this course for credit.

**Department(s):** Department of Physics

### **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

**Offering(s):** Offered in even-numbered years.

**Equate(s):** MUSC\*1090

**Restriction(s):** Students who have standing in any 1000 level physics course, (except PHYS\*1300 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.

**Department(s):** Department of Physics

### **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)

**Department(s):** Department of Physics

### **PHYS\*2180 Experimental Techniques in Physics W (3-3) [0.50]**

This course is designed to aid students in the development of core practical skills in physics. Students will be required to conduct a series of experiments exploring fundamental concepts in mechanics, electricity & magnetism, thermal physics, as well as the experimental basis of quantum physics. There will be a strong emphasis on data and error analysis with a variety of software applications.

**Prerequisite(s):** PHYS\*2330

**Department(s):** Department of Physics

### **PHYS\*2240 Thermal Physics F (3-0) [0.50]**

This course will introduce students to the basic ideas of thermal physics, including temperature, heat, work, thermal and diffusive equilibrium, and the Boltzmann distribution. The statistical basis for entropy and for thermodynamics will be discussed. Applications of thermodynamics to both non-interacting and interacting systems will be presented.

**Prerequisite(s):** (1 of IPS\*1510, MATH\*1210, MATH\*2080), (IPS\*1500 or PHYS\*1080)

**Restriction(s):** CHEM\*2820

**Department(s):** Department of Physics

### **PHYS\*2310 Mechanics W (4-0) [0.50]**

This course continues building the foundation in mechanics begun in the first year. Topics include, one, two and three dimensional motion, damped and forced harmonic oscillator, gravitation and orbital motion, special relativity, noninertial reference frames, and rigid body dynamics.

**Prerequisite(s):** MATH\*2270, (1 of IPS\*1500, PHYS\*1000 , PHYS\*1080)

**Restriction(s):** PHYS\*2440

**Department(s):** Department of Physics

### **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):** IPS\*1510 or [(MATH\*1210 or MATH\*2080), (1 of PHYS\*1010, PHYS\*1070, PHYS\*1130)]

**Restriction(s):** PHYS\*2460

**Department(s):** Department of Physics

### **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

**Department(s):** Department of Physics

### **PHYS\*2600 General Astronomy F (4-1) [0.50]**

An introduction to astronomy, this course covers the solar system, the sun, stellar and galactic structure.

**Offering(s):** Offered through Distance Education format only.

**Prerequisite(s):** IPS\*1500 or [(1 of PHYS\*1010, PHYS\*1070, PHYS\*1080, PHYS\*1130, PHYS\*1300), (1 of MATH\*1030, MATH\*1080, MATH\*1160, MATH\*1200)]

**Department(s):** Department of Physics

**PHYS\*3000 Optics: Fundamentals and Applications W (3-0) [0.50]**

This course will introduce students to the fundamental principles of wave and geometric optics, with an emphasis on applications. Topics will include reflection, refraction, diffraction, interference, and polarization, as well as fibre optics, imaging systems and lasers.

*Prerequisite(s):* PHYS\*2340, PHYS\*3130

*Restriction(s):* PHYS\*3220

*Department(s):* Department of Physics

**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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* IPS\*1500 or [( PHYS\*1000 or PHYS\*1080 ), (1 of MATH\*1000 , MATH\*1080, MATH\*1200)], (1 of IPS\*1510, PHYS\*1010, PHYS\*1070, PHYS\*1130)

*Department(s):* Department of Physics

**PHYS\*3130 Mathematical Physics F (3-0) [0.50]**

This course covers a number of mathematical techniques that are required in all areas of physics. Curvilinear coordinates, special functions, Fourier series and integral transforms, Green's functions, and a number of advanced topics will be discussed. The course emphasizes the application of these techniques to solve a variety of physics problems, providing context to the fundamental tools of the discipline.

*Prerequisite(s):* (1 of MATH\*1160, MATH\*2150 , MATH\*2160 ), MATH\*2200, MATH\*2270, PHYS\*2310, PHYS\*2340

*Department(s):* Department of Physics

**PHYS\*3170 Radioactivity and Radiation Interactions F (3-0) [0.50]**

This course will provide a fundamental understanding of radiation physics and dosimetry, as well as assist students in the development of their problem solving skills in this field. Topics will include: atomic and nuclear structure, radioactivity, interaction of radiation with matter, radiobiology, radiation dosimetry, and external radiation protection. Throughout the course, applications of radiation physics in medicine will be highlighted.

*Prerequisite(s):* (1 of IPS\*1510, MATH\*1210, MATH\*2080), ( MATH\*2170 or MATH\*2270 )

*Department(s):* Department of Physics

**PHYS\*3230 Quantum Mechanics I F (4-0) [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):* (1 of MATH\*1160, MATH\*2150 , MATH\*2160 ), ( MATH\*2170 or MATH\*2270 ), (PHYS\*2340 or PHYS\*2470 )

*Department(s):* Department of Physics

**PHYS\*3400 Advanced Mechanics F (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\*2310 or PHYS\*2440 )

*Department(s):* Department of Physics

**PHYS\*3510 Intermediate Laboratory F,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\*2180 or (NANO\*2100, PHYS\*2310)

*Department(s):* Department of Physics

**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.

*Department(s):* Department of Physics

**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.

*Department(s):* Department of Physics

**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

*Department(s):* Department of Physics

**PHYS\*4040 Quantum Mechanics II W (4-0) [0.50]**

This is a second course in quantum mechanics. Topics include spin and two-level systems, quantum systems of multiple particles, quantum description of fermions and bosons, time independent perturbation theory, and the fine structure of hydrogen.

*Prerequisite(s):* PHYS\*3230

*Department(s):* Department of Physics

**PHYS\*4070 Clinical Applications of Physics in Medicine W (3-0) [0.50]**

This course provides an overview of the application of physics to medicine. The physical concepts underlying the diagnosis and treatment of disease will be explored. Topics will include general imaging principles such as resolution, intensity, and contrast; x-ray imaging and computed tomography; radioisotopes and nuclear medicine, SPECT and PET; magnetic resonance imaging; ultrasound imaging and radiation therapy.

*Prerequisite(s):* PHYS\*3170

*Restriction(s):* PHYS\*4560 .

*Department(s):* Department of Physics

**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\*4040

*Department(s):* Department of Physics

**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\*4040

*Department(s):* Department of Physics

**PHYS\*4150 Solid State Physics W (3-0) [0.50]**

The topics covered in this course include: bonding in solids, thermal and electrical properties of solids, energy bands, imperfections in solids, properties of semiconductors and insulators.

*Prerequisite(s):* PHYS\*4040, PHYS\*4240

*Department(s):* Department of Physics

**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 )

*Department(s):* Department of Physics

**PHYS\*4240 Statistical Physics II F (3-0) [0.50]**

A continuation of PHYS\*2240 including a discussion of the grand canonical distribution, quantum statistics, and transport theory.

*Prerequisite(s):* (PHYS\*2240 or PHYS\*3240 ), PHYS\*3230

*Department(s):* Department of Physics

**PHYS\*4500 Advanced Physics Laboratory F,W (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\*3510

*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.

*Department(s):* Department of Physics

**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)

*Department(s):* Department of Physics

**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):* (1 of MATH\*1160, MATH\*2150 , MATH\*2160 ), ( MATH\*2170 or MATH\*2270), [( PHYS\*2450 , PHYS\*2470 ) or (PHYS\*2180 , PHYS\*2310, PHYS\*2340)]

*Department(s):* Department of Physics

**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):* (1 of MATH\*1160, MATH\*2150 , MATH\*2160 ), ( MATH\*2170 or MATH\*2270), [( PHYS\*2450 , PHYS\*2470 ) or (PHYS\*2180 , PHYS\*2310, PHYS\*2340)]

*Department(s):* Department of Physics

**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):* (1 of MATH\*1160, MATH\*2150 , MATH\*2160 ), ( MATH\*2170 or MATH\*2270), [( PHYS\*2450 , PHYS\*2470 ) or (PHYS\*2180 , PHYS\*2310, PHYS\*2340)]

*Department(s):* Department of Physics

## Physiology

*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.*

## Plant Biology

*School of Environmental Sciences*

*Department of Plant Agriculture*

### PBIO\*3110 Crop Physiology W (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.

*Prerequisite(s):* 1 of BIOL\*1050, BIOL\*1070, BIOL\*1090

*Department(s):* Department of Plant Agriculture

### PBIO\*3750 Plant Tissue Culture F (2-3) [0.50]

This course examines and discusses 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.

*Prerequisite(s):* AGR\*2470 or BOT\*2100

*Department(s):* Department of Plant Agriculture

### 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.

*Prerequisite(s):* 1 of BOT\*2100, MICR\*2030, (BIOL\*1070, BIOL\*1090, MBG\*2040)

*Department(s):* School of Environmental Sciences

### PBIO\*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.

*Prerequisite(s):* 1 of ENVB\*3210 , ENVS\*3210, MICR\*3090, MICR\*3220

*Equate(s):* ENVB\*4070

*Department(s):* Department of Plant Agriculture

### PBIO\*4150 Molecular and Cellular Aspects of Plant Development W (3-0) [0.50]

This course examines 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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* (AGR\*2470 or BOT\*2100), (MBG\*2040 or MBG\*2400)

*Department(s):* Department of Plant Agriculture

### PBIO\*4530 Plants and Environmental Pollution 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, NO<sub>x</sub>) and soil (such as metals). This course also covers how to use plants to improve air (both indoor and outdoor), water and soil environment. The format includes both lecture and presentation/discussion of current and historical peer-reviewed literature.

*Prerequisite(s):* (1 of BIOL\*2060, BOT\*2100, ENVM\*1200 , ENVS\*2040 , ENVS\*2330, PBIO\*3110), CHEM\*1040

*Department(s):* School of Environmental Sciences

### 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.

*Prerequisite(s):* (AGR\*2470 or BOT\*2100), (MBG\*2040 or MBG\*2400)

*Department(s):* Department of Plant Agriculture

## 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

*Department(s):* Department of Political Science

#### POLS\*1400 Issues in Canadian Politics F (3-0) [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.

*Offering(s):* Also offered through Distance Education format.

*Department(s):* Department of Political Science

#### 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.

*Offering(s):* Also offered through Distance Education format.

*Department(s):* Department of Political Science

#### 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.

*Offering(s):* Offered through Distance Education format only.

*Restriction(s):* PHIL\*2280

*Department(s):* Department of Political Science

#### 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.

*Department(s):* Department of Political Science

#### 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.

*Department(s):* Department of Political Science

#### 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.

*Department(s):* Department of Political Science

#### 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.

*Department(s):* Department of Political Science

#### 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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* POLS\*1150 or POLS\*1400

*Department(s):* Department of Political Science

#### 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.

*Offering(s):* Also offered through Distance Education format.

*Department(s):* Department of Political Science

#### POLS\*2350 Law from a Political Science Perspective F (3-0) [0.50]

This course will consider law as both the output of political action and as the structure in which political action occurs. It will introduce students to core legal concepts, explore the impact of law on private and public actors, and help students develop legal research skills.

*Prerequisite(s):* POLS\*1150 or POLS\*1400

*Department(s):* Department of Political Science

#### 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

*Department(s):* Department of Political Science

#### 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

*Department(s):* Department of Political Science

#### 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

*Department(s):* Department of Political Science

#### 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

*Department(s):* Department of Political Science

#### 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\*2350, POLS\*2250, POLS\*2300

*Department(s):* Department of Political Science

#### POLS\*3140 Politics and the Charter of Rights W (3-0) [0.50]

This course examines the legal and political effects of the Canadian Charter of Rights and Freedoms. Issues to be examined may include the Charter's influence on Canadian political culture and identity, interest groups and social movements, the power of the courts, and public policy. Analysis of specific Charter sections and judicial decisions along with comparisons to other countries will be used to aid the analysis.

*Prerequisite(s):* POLS\*2300 or POLS\*2350

*Department(s):* Department of Political Science

**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

*Department(s):* Department of Political Science

**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)

*Department(s):* Department of Political Science

**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

*Department(s):* Department of Political Science

**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

*Department(s):* Department of Political Science

**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

*Department(s):* Department of Political Science

**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

*Department(s):* Department of Political Science

**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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 1 of POLS\*2350, POLS\*2250, 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.

*Department(s):* Department of Political Science

**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

*Department(s):* Department of Political Science

**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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 7.50 credits

*Department(s):* Department of Political Science

**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

*Department(s):* Department of Political Science

**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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 5.00 credits

*Department(s):* Department of Political Science

**POLS\*3450 European Governments and Politics F (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):* 4.00 credits including 1 of EURO\*1050 , POLS\*2100, POLS\*2200

*Department(s):* Department of Political Science

**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

*Department(s):* Department of Political Science

**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.

*Department(s):* Department of Political Science

**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).

*Department(s):* Department of Political Science

**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

*Department(s):* Department of Political Science

**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

*Department(s):* Department of Political Science

**POLS\*3790 International Political Economy 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

*Department(s):* Department of Political Science

**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.

*Department(s):* Department of Political Science

**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

*Department(s):* Department of Political Science

**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

*Department(s):* Department of Political Science

**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.

*Department(s):* Department of Political Science

**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.

*Department(s):* Department of Political Science

**POLS\*4050 Advanced Topics in Law and Politics U (3-0) [1.00]**

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):* POLS\*3130, (0.50 credits at the 3000-level in the Law, Policy and Governance stream or 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.

*Department(s):* Department of Political Science

**POLS\*4060 Advanced Topics Lecture in Law and Politics F,W (3-0) [0.50]**

This advanced lecture course explores topics in law and politics. Specific topics vary depending on the interests of the instructor. Potential topics include the relationship between law and social change, human rights, the relationship between law and power, judicial decision-making, and the relationship between law, class, gender, race, and sexuality.

*Prerequisite(s):* 1 of POLS\*2350, POLS\*3130, POLS\*3140, POLS\*3300

*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. Students may not receive credit for both POLS\*4050 and POLS\*4060

*Department(s):* Department of Political Science

**POLS\*4070 Courts and Parliament F,W (3-0) [1.00]**

The course critically examines the complex relationship between the judiciary and representative institutions. By comparing the treatment of current political controversies (assisted suicide, prostitution, drug treatment), students will better appreciate the often-subtle exchanges between the two institutions and further enhance their research abilities in regards to both legal and legislative processes.

*Prerequisite(s):* 1 of POLS\*2350, POLS\*3130, POLS\*3300

*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.

*Department(s):* Department of Political Science

**POLS\*4100 Women, Justice and Public Policy U (3-0) [1.00]**

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.

*Department(s):* Department of Political Science

**POLS\*4140 Conceptions of Canada W (3-0) [1.00]**

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.

*Department(s):* Department of Political Science

**POLS\*4150 Advanced Lecture in Conceptions of Canada W (3-0) [0.50]**

This advanced lecture course will explore evolving conceptions of Canadian identity and nationalism through a 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, (2 of HIST\*3160, POLS\*3050, POLS\*3210, POLS\*3270, POLS\*3470)

*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. Students may not receive credit for both POLS\*4140 and POLS\*4150

*Department(s):* Department of Political Science

**POLS\*4160 Multi-Level Governance in Canada U (3-0) [1.00]**

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.

**Department(s):** Department of Political Science

**POLS\*4200 International Political Economy U (3-0) [1.00]**

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.

**Department(s):** Department of Political Science

**POLS\*4250 Topics in Public Management W (3-0) [1.00]**

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.

**Department(s):** Department of Political Science

**POLS\*4260 Topics in Public Policy U (3-0) [1.00]**

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.

**Department(s):** Department of Political Science

**POLS\*4270 Advanced Lecture in Public Management F (3-0) [0.50]**

This advanced lecture course examines 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, (2 of HIST\*3160, POLS\*3050, POLS\*3130, POLS\*3210, POLS\*3250, POLS\*3270, POLS\*3300, POLS\*3370, POLS\*3440, POLS\*3470, POLS\*3670)

**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.

**Department(s):** Department of Political Science

**POLS\*4280 Advanced Lecture in Public Policy W (3-0) [0.50]**

The advanced lecture course will examine various public policy issues, such as social policy, health care policy, environmental policy, or economic policy in a Canadian or comparative context.

**Prerequisite(s):** (2 of POLS\*2250, POLS\*2300, POLS\*3250), (2 of HIST\*3160, POLS\*3050, POLS\*3130, POLS\*3210, POLS\*3270, POLS\*3300, POLS\*3370, POLS\*3440, POLS\*3470, POLS\*3670)

**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.

**Department(s):** Department of Political Science

**POLS\*4300 Human Rights, Ethics, and Development W (3-0) [1.00]**

This course will examine the political and ethical consequences of adopting a human rights framework in national and international contexts by both state and non-state actors. This subject will be explored from a range of historical, theoretical and practical perspectives.

**Prerequisite(s):** (1 of POLS\*2080, POLS\*2100, POLS\*2200), 1.00 credits at the 3000 level in Political Science.

**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.

**Department(s):** Department of Political Science

**POLS\*4310 Advanced Lecture in Women, Justice and Public Policy F,W (3-0) [0.50]**

This advanced lecture 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. The primary focus of the topics covered in the course will be Canadian, although the experiences of women in other countries will be covered, particularly as it relates to "best practices" where appropriate.

**Prerequisite(s):** (2 of POLS\*2250, POLS\*2300, POLS\*2350, POLS\*3250), (2 of HIST\*3160, POLS\*3050, POLS\*3130, POLS\*3210, POLS\*3270, POLS\*3300, POLS\*3370, POLS\*3440, POLS\*3470, POLS\*3670)

**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.

**Department(s):** Department of Political Science

**POLS\*4320 Advanced Lecture on Human Rights, Ethics and Development F (3-0) [0.50]**

This advanced lecture course examines the political and ethical consequences of adopting a human rights framework in national and international contexts by both state and non-state actors. This subject will be explored from a range of historical, theoretical and practical perspectives.

**Prerequisite(s):** (1 of POLS\*2080, POLS\*2100, POLS\*2200), 1.00 credits at the 3000 level in Political Science.

**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.

**Department(s):** Department of Political Science

**POLS\*4340 Nationalism, State-building and Identity U (3-0) [1.00]**

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).

**Department(s):** Department of Political Science

**POLS\*4710 Topics in Comparative Politics U (3-0) [1.00]**

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.

**Department(s):** Department of Political Science

**POLS\*4720 Topics in International Relations U (3-0) [1.00]**

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.

**Department(s):** Department of Political Science

**POLS\*4730 International Relations of the Middle East W (3-0) [1.00]**

This course is designed as an advanced introduction to the international relations of the Middle East. The course focuses on theories of international relations and their applicability to specific case studies of Middle Eastern politics. The course provides a critical examination of conflicts in the region, and contextualizes those conflicts within both realist and neo-realist theories of international relations. The course also provides a critical examination of the Arab-Israeli crisis, with a focus on peace negotiations. The course is offered as a seminar, with a heavy emphasis on class participation. Students participate in a simulation of an Arab-Israeli peace negotiation.

*Prerequisite(s):* POLS\*2200, (1.00 credit at the 3000 level in the Comparative Politics and/or International Relations and Global Studies streams)

*Restriction(s):* POLS\*4910

*Department(s):* Department of Political Science

**POLS\*4740 Advanced Topics in Rights and Liberties F (3-0) [1.00]**

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.

*Department(s):* Department of Political Science

**POLS\*4760 Advanced Lecture in Comparative Politics W (3-0) [0.50]**

This advanced lecture course examines theories and problems in comparative politics and government in developing and industrialized countries. The geographical and theoretical focus of the course will vary depending on the interests of the instructor.

*Prerequisite(s):* (POLS\*2080 or POLS\*2100), (2 of POLS\*3000, POLS\*3060, POLS\*3080, POLS\*3160, POLS\*3320, POLS\*3410, POLS\*3440, POLS\*3450, POLS\*3670, POLS\*3890, POLS\*3920)

*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.

Students may not receive credit for both POLS\*4710 and POLS\*4760

*Department(s):* Department of Political Science

**POLS\*4770 Advanced Lecture in International Relations F (3-0) [0.50]**

This advanced lecture course considers theories and problems in the field of International Relations. The theoretical and/or geographical focus will reflect the interests of the instructor.

*Prerequisite(s):* POLS\*2200, (2 of POLS\*3160, POLS\*3320, POLS\*3490, POLS\*3790)

*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.

Students may not receive credit for both POLS\*4720 and POLS\*4770

*Department(s):* Department of Political Science

**POLS\*4780 Advanced Lecture in Rights and Liberties F,W (3-0) [0.50]**

This lecture 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\*2350, (1 of POLS\*3130, POLS\*3210, POLS\*3300, POLS\*3140)

*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.

Students may not receive credit for both POLS\*4740 and POLS\*4780

*Department(s):* Department of Political Science

**POLS\*4900 Special Topics Seminar in Political Science S,F,W (3-0) [1.00]**

This seminar-based course explores a current issue in Political Science. Topics will vary from year to year and will reflect the research and teaching interests of the faculty member directing the course. Information on the topic of the current offering can be found on the departmental website.

*Prerequisite(s):* 14.00 credits, including 1.00 credits in Political Science at the 3000 level.

*Department(s):* Department of Political Science

**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.

*Department(s):* Department of Political Science

**POLS\*4930 Selected Topics in Political Science 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.

*Department(s):* Department of Political Science

**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.

*Department(s):* Department of Political Science

**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.

*Department(s):* Department of Political Science

## Population Medicine

*Department of Population Medicine*

### **POPM\*3240 Epidemiology F,W (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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* (BIOL\*1080 or BIOL\*1090), STAT\*2040

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods. Please see the Department of Population Medicine website for more information.

*Department(s):* Department of Population Medicine

### **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 .

*Department(s):* Department of Population Medicine

### **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.

*Prerequisite(s):* ANSC\*2340 or ANSC\*3080

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods. Please see the Department of Population Medicine web site for more information.

*Department(s):* Department of Population Medicine

## Portuguese

**POR<sup>T</sup>\*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.

*Department(s):* School of Languages and Literatures

**POR<sup>T</sup>\*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):* POR<sup>T</sup>\*1100

*Restriction(s):* Instructor consent required.

*Department(s):* School of Languages and Literatures

## Psychology

### Department of Psychology

Psychology majors are encouraged to participate in the on-going research of the department, through independent study courses: PSYC\*3240, PSYC\*4240, PSYC\*4870, and PSYC\*4880.

The required number of Psychology credits for the Major is 9.00. Students may choose to take up to an additional 2.00 credits in Psychology. The maximum number of credits at each level is as follows:

- 1000 level courses: no cap
- 2000 level courses: 3.50 credits
- 3000 level courses: 3.50 credits
- 4000 level courses: 3.00 credits

*Students wishing to take a 2000, 3000 or 4000 level course without having completed the appropriate prerequisites must receive permission of the Psychology Academic Advisor and Manager who will determine whether the student has the required background for the course.*

**Honours Courses:** Courses designated with (H) are for students in Psychology Honours programs. These include: B.A. Honours Psychology (PYSC, PYSC:C) 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) major or minor. 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 is required to enroll in H designated courses.

*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\*1000 Introduction to Psychology S,F,W (3-0) [0.50]

This is an introduction to the content and methods of psychology. It will cover the major areas such as neuroscience, sensation and perception, learning, cognition, motivation, human development, personality, psychopathology and its treatment, and social psychology.

*Offering(s): Also offered through Distance Education format.*

*Restriction(s): PSYC\*1100 , PSYC\*1200*

*Department(s): Department of Psychology*

### PSYC\*1010 Making Sense of Data in Psychological Research F,W (3-0) [0.50]

This course introduces research designs and quantitative approaches used in psychological science, with an emphasis on conceptual understanding. Specific topics include distributions, meta-analysis, confidence intervals and p-values, effect size, and regression, as well as the differences between descriptive, correlational, and experimental research designs.

*Offering(s): Also offered through Distance Education format.*

*Prerequisite(s): 1 of PSYC\*1000, PSYC\*1100 , PSYC\*1200*

*Restriction(s): PSYC\*2010 , STAT\*2040, STAT\*2060, STAT\*2080, STAT\*2090, STAT\*2100 , STAT\*2120 This is a Priority Access Course. Some restrictions may apply during some time periods.*

*Department(s): Department of Psychology*

### PSYC\*1500 Foundational Skills for Psychology F,W (3-0) [0.50]

This course is designed to help Psychology majors to optimize their learning in the Psychology program. The primary focus is on individual skill development with respect to academic learning, written and oral communication, career planning, and working in groups. Specific topics will vary by instructor.

*Co-requisite(s): 1 of PSYC\*1000, PSYC\*1100 , PSYC\*1200*

*Restriction(s): Restricted to Psychology majors BAH, BAH:C, BSC.PBC, and Psychology Area of Concentration*

*Department(s): Department of Psychology*

### PSYC\*2020 Abnormal Psychology W (3-0) [0.50]

This course is an introduction to abnormal psychology including a multidimensional conceptualization of mental health, assessment, diagnosis, and treatment. Common psychological disorders will be explored with respect to etiology, assessment, current diagnosis and classification, as well as treatment. Emphasis will be given to broad empirical research and to the experiences of individuals with these disorders.

*Prerequisite(s): PSYC\*1000*

*Restriction(s): PSYC\*3390 , This is a Priority Access Course. Some restrictions may apply during some time periods.*

*Department(s): Department of Psychology*

### PSYC\*2070 Teams, Leadership, and Professional Behaviour F,W (3-0) [0.50]

The course will focus on the theory and practical application of Organizational Psychology with regard to leadership, teams, and professional behaviour. The course will provide students with opportunities to assess their leadership and teamwork skills, as well as active learning activities to practice these skills. Key topics will include work motivation, time management, personal organizational skills, goal setting, conflict management, social influence and stress management.

*Prerequisite(s): PSYC\*1500 or 4.00 credits in Psychology*

*Restriction(s): PSYC\*3080 , Restricted to Psychology majors BAH, BAH:C, BSC.PBC, and Psychology Area of Concentration Instructor consent required.*

*Department(s): Department of Psychology*

### PSYC\*2310 Social Psychology S,F,W (3-0) [0.50]

This course introduces students to the field of social psychology. Major topics introduced will include: social influence, social cognition, attitude, stereotype and prejudice, the self, attraction and interpersonal relationships, group processes and intergroup relations. The course also aims for students to use the knowledge acquired to think critically about how their actions and those of others are influenced by social forces. In addition, the course aims to introduce students to the role of culture in shaping thoughts and behaviour and to provide them an opportunity to appreciate diverse perspectives.

*Offering(s): Also offered through Distance Education format.*

*Prerequisite(s): 1 of PSYC\*1000, PSYC\*1100 , PSYC\*1200*

*Department(s): Department of Psychology*

### PSYC\*2330 Principles of Learning F (3-0) [0.50]

This course provides a detailed description of principles and concepts of learning and motivation, as well as an introduction to their underlying neurobiological mechanisms. Through the examination of empirical evidence in the fields of Psychology and Behavioural Neuroscience, this course offers a comprehensive description of the role of conditioning in normal and abnormal behaviours.

*Prerequisite(s): PSYC\*1000*

*Restriction(s): This is a Priority Access Course. Some restrictions may apply during some time periods.*

*Department(s): Department of Psychology*

### PSYC\*2360 Psychological Methods and Statistics S,F,W (3-0) [0.50]

This course builds on students' understanding of basic psychological research methods and statistics, with an emphasis on designing, interpreting, and communicating research. Topics covered throughout the term may include: research ethics, the scientific method, qualitative and quantitative measures, reliability and validity, complex research designs using multiple predictor or independent variables, and the reading and writing of psychological journal articles.

*Offering(s): Also offered through Distance Education format.*

*Prerequisite(s): (1 of PSYC\*1000, PSYC\*1100 , PSYC\*1200 ), (1 of PSYC\*1010, PSYC\*2010 , STAT\*2040)*

*Department(s): Department of Psychology*

### PSYC\*2390 Sensation and Perception 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. (C)

*Offering(s): Also offered through Distance Education format.*

*Prerequisite(s): 1 of PSYC\*1000, PSYC\*1100 , PSYC\*1200*

*Restriction(s): This is a Priority Access Course. Some restrictions may apply during some time periods.*

*Department(s): Department of Psychology*

### PSYC\*2410 Behavioural Neuroscience I F (3-0) [0.50]

This course is 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 learning and memory.

*Offering(s): Also offered through Distance Education format.*

*Prerequisite(s): 1 of PSYC\*1000, PSYC\*1100 , PSYC\*1200*

*Restriction(s): This is a Priority Access Course. Some restrictions may apply during some time periods.*

*Department(s): Department of Psychology*

**PSYC\*2450 Developmental Psychology F (3-0) [0.50]**

This course is 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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 1 of PSYC\*1000, PSYC\*1100 , PSYC\*1200

*Restriction(s):* FRHD\*2270. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* Department of Psychology

**PSYC\*2650 Cognitive Psychology 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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 1 of PSYC\*1000, PSYC\*1100 , PSYC\*1200

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* Department of Psychology

**PSYC\*2740 Personality W (3-0) [0.50]**

This course is a review of the theory, assessment procedures and research findings pertinent to major personality constructs. Personality research, methodology and design will also be covered.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 1 of PSYC\*1000, PSYC\*1100 , PSYC\*1200

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* Department of Psychology

**PSYC\*3000 Historical and Critical Perspectives on Psychology F,W (3-0) [0.50]**

The purpose of this course is to help students understand the socio-historical and theoretical context of modern psychological research and practice. This includes: 1) evaluating basic assumptions underlying modern psychology by drawing on historical, theoretical and philosophical perspectives, and 2) investigating historical and current controversies within psychology. Topics may include the question of psychology's scientific status, the assumptions embedded in psychological theory and research methodology, social constructionism, free will/agency, and the relations between psychology, power, ethics, and politics.

*Prerequisite(s):* PSYC\*2360, (2 of PSYC\*2020, PSYC\*2310, PSYC\*2450, PSYC\*2740), (2 of PSYC\*2330, PSYC\*2390, PSYC\*2410, PSYC\*2650)

*Restriction(s):* PSYC\*4370 , PSYC\*4900 . Restricted to psychology majors BAH, BAH:C, BSC: PBC, and Psychology area of concentration

*Department(s):* Department of Psychology

**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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* PSYC\*2310

*Department(s):* Department of Psychology

**PSYC\*3030 Neurochemical Basis of Behaviour W (3-0) [0.50]**

This course analyses how drugs act on various neurochemical systems to regulate motivation and behaviour. Topics of discussion may include psychopathology and its treatment.

*Prerequisite(s):* 2.50 credits in Psychology including (BIOM\*3090 or PSYC\*2410)

*Department(s):* Department of Psychology

**PSYC\*3100 Evolutionary Psychology F (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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 2.50 credits in Psychology

*Department(s):* Department of Psychology

**PSYC\*3110 Topics in Health Psychology W (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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* NEUR\*2000 or 2.50 credits in Psychology

*Department(s):* Department of Psychology

**PSYC\*3240 Independent Research Project S,F,W (0-6) [0.50]**

This course provides individual students with hands-on experience conducting a research project. Students are supervised directly by a faculty member as they conduct an in-depth investigation of a specific topic within psychology. Typically, the course involves both the practice and reporting of research. Through this experience students will develop a broader appreciation of the relations between knowledge, theory and research while acquiring basic skills in research methodologies and modes of inquiry. In addition, students will develop their written and oral communication skills (e.g., integration of relevant literature, reporting of research). Course registration requires the signature of the Psychology Academic Manager. This signature is contingent upon the student demonstrating they have obtained a faculty supervisor's signature and satisfy the course prerequisites. Please see the Psychology department website for more information. <https://www.uoguelph.ca/psychology/>

*Prerequisite(s):* 2.50 credits in Psychology including PSYC\*2360

*Equate(s):* PSYC\*3900

*Restriction(s):* A minimum grade point average of 75% in Psychology courses. Instructor consent required.

*Department(s):* Department of Psychology

**PSYC\*3250 Psychological Measurement F,W (3-0) [0.50]**

This course focuses on training students how to conduct research such that measurement theory guides measure selection and construction. Consequences of measurement theory (reliability/validity) for the accuracy of research findings and interpretation of test scores are also covered. A variety of individual difference variables are examined with an emphasis on how measurement strategies differ depending on the nature of the construct. (H)

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* PSYC\*2360

*Restriction(s):* Restricted to students in BAH.PSYC, BAH.PSYC:C, BAH.ISHB, BSCH.PBC, or a major or minor in Neuroscience with a minimum cumulative average of 70% in all Psychology course attempts.

*Department(s):* Department of Psychology

**PSYC\*3270 Cognitive Neuroscience F (3-0) [0.50]**

This course provides an overview of the neural process that support cognitive abilities such as attention, perception, memory, emotion, and reasoning. An emphasis is placed on primary research with the goal of revealing the types of methods that cognitive neuroscientists use, and types of questions that they ask, as they try to understand the relationship between our minds and brains.

*Prerequisite(s):* 1 of NEUR\*2000, PSYC\*2390, PSYC\*2410, PSYC\*2650

*Restriction(s):* PSYC\*4600 .

*Department(s):* Department of Psychology

**PSYC\*3280 Minds, Brains & Machines U (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):* 2.50 credits in Psychology or 3.00 credits in Philosophy

*Department(s):* Department of Psychology

**PSYC\*3290 Conducting Statistical Analyses in Psychology F,W (3-1) [0.50]**

This course focuses on training students in the quantitative analysis and communications skills needed to become a researcher in psychology. Students conduct a correlation-based meta-analysis to help them concretely understand sampling distributions and the difficulties associated with obtaining study results that replicate. This meta-analytic foundation is then leveraged to teach traditional psychological analysis techniques (e.g., t-test, analysis of variance, and bi-variate/multiple regression) with an emphasis on maximizing factors that increase the probability of study findings that replicate. The value of interpreting results using effect sizes with confidence intervals is discussed and the logic of null-hypothesis testing is briefly reviewed.

*Prerequisite(s):* 2.50 credits in Psychology including PSYC\*2360

*Restriction(s):* PSYC\*2040 , STAT\*2050.

*Department(s):* Department of Psychology

**PSYC\*3300 Psychology of Gender W (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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 2.50 credits in Psychology including PSYC\*2310

*Department(s):* Department of Psychology

**PSYC\*3330 Memory and Attention F (3-0) [0.50]**

This course provides an overview of attention and memory: how we prioritize some objects and events over others and how such prior experience influences our subsequent thoughts, feelings and actions. The course will cover what is known about memory and attention from research in the overlapping fields of cognitive psychology, neuropsychology, and cognitive neuroscience.

*Prerequisite(s):* 2.50 credits in Psychology including PSYC\*2650

*Department(s):* Department of Psychology

**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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 2.50 credits in Psychology including PSYC\*2310

*Department(s):* Department of Psychology

**PSYC\*3410 Behavioural Neuroscience II F (3-2) [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):* NEUR\*2000 or PSYC\*2410

*Restriction(s):* Restricted to students in Neuroscience (major or Minor). This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* Department of Psychology

**PSYC\*3450 Social and Personality Development W (3-0) [0.50]**

This course is 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):* 2.50 credits in Psychology including (FRHD\*2270 or PSYC\*2450)

*Restriction(s):* This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* Department of Psychology

**PSYC\*3470 Putting Psychology to Work W (3-0) [0.50]**

This course provides students with the opportunity to prepare for the transition to post-graduate programs and work. This course covers topics related to industrial psychology from individual and organizational perspectives. Topics include: the history of work and industrial psychology, career management, job analysis, recruitment, selection, employment law, compensation and benefits, performance appraisal, training and development as well as succession planning

*Prerequisite(s):* PSYC\*2360, (2 of PSYC\*2020, PSYC\*2310, PSYC\*2450, PSYC\*2740), (1 of PSYC\*2330, PSYC\*2390, PSYC\*2410, PSYC\*2650)

*Restriction(s):* PSYC\*3070 , Restricted to psychology majors BAH, BAH:C, and Psychology area of concentration This is a Priority Access Course. (BAG Psychology area of concentration)

*Department(s):* Department of Psychology

**PSYC\*3480 Psychology of Sport U (3-0) [0.50]**

This course provides 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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* PSYC\*2310 or PSYC\*2740

*Department(s):* Department of Psychology

**PSYC\*3490 Social and Organizational Psychology F (3-0) [0.50]**

A number of applied issues will be examined from a social and organizational psychological perspective. The topics will include health and well-being; attributions and person perception; intergroup relations and prejudice; and social influence. Students will learn how to apply psychological theories and research to understand and ameliorate applied issues.

*Prerequisite(s):* 2.50 credits in Psychology including PSYC\*2310

*Restriction(s):* PSYC\*3080 , This is a Priority Access Course. for Psychology majors BAH, BAH:C, BSC: PBC, and Psychology area of concentration

*Department(s):* Department of Psychology

**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.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 1 of FRHD\*2270, PSYC\*2310, PSYC\*2740, PSYC\*2450

*Department(s):* Department of Psychology

**PSYC\*3800 Psychology and Education U (3-0) [0.50]**

The application of psychological principles and techniques to the study of the educational process.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 1 of FRHD\*2270, PSYC\*1000, PSYC\*1100 , PSYC\*1200

*Department(s):* Department of Psychology

**PSYC\*3850 Intellectual Disabilities U (3-0) [0.50]**

This course covers applied and theoretical aspects of intellectual disabilities, and lays a foundation for work in the area of intellectual disabilities.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* FRHD\*2270 or PSYC\*2450

*Department(s):* Department of Psychology

**PSYC\*3910 Psychology Externship F,W,S (0-6) [0.50]**

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.)

*Prerequisite(s):* PSYC\*2360, (2 of PSYC\*2020, PSYC\*2310, PSYC\*2450, PSYC\*2740), (1 of PSYC\*2330, PSYC\*2390, PSYC\*2410, PSYC\*2650)

*Restriction(s):* Restricted to Psychology majors BAH, BAH:C, and Psychology area of concentration. Instructor consent required.

*Department(s):* Department of Psychology

**PSYC\*4240 Advanced Independent Research Project S,E,W (3-6) [0.50]**

This course provides individual students with hands-on experience conducting a research project. Students are supervised directly by a faculty member as they conduct an in-depth investigation of a specific topic within psychology. Typically, the course involves both the practice and reporting of research. Students will apply the research and communication skills they have acquired through prior coursework in order to work more independently. Course registration requires the signature of the Psychology Academic Manager. This signature is contingent upon the student demonstrating they have obtained a faculty supervisor's signature and satisfy the course prerequisites. Please see the Psychology department website for more information. <https://www.uoguelph.ca/psychology/>

*Prerequisite(s):* 14.00 credits including [( PSYC\*2040 or PSYC\*3290 ), 1.00 credits in Psychology at the 3000 level]

*Restriction(s):* PSYC\*4500 , PSYC\*4510 . Restricted to students in BAH.PSYC, BAH.PSYC:C, BAH.ISHB, BSCH.PBC or a major or minor in Neurosciences with a minimum grade point average of 75% in all Psychology course attempts. Instructor consent required.

*Department(s):* Department of Psychology

**PSYC\*4310 Advanced Topics in Social and Applied Social Psychology W (3-0) [0.50]**

This is an in-depth examination of specific advances in social psychological research, theory, and/or applications. Selected topic areas may include the psychology of social groups, women's health and well-being, and community interventions. Specific topics, to be announced prior to course selection, will vary according to the interests of the instructor of the course.

*Prerequisite(s):* 14.00 credits including [PSYC\*2310, PSYC\*3250, ( PSYC\*2040 or PSYC\*3290 ), 0.50 credits in Psychology at the 3000 level]

*Restriction(s):* Restricted to students in BAH.PSYC, BAH.PSYC:C, BAH.ISHB, BSCH.PBC, or a major or minor in Neuroscience with a minimum grade point average of 70% in all Psychology course attempts. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* Department of Psychology

**PSYC\*4330 Advanced Topics in I/O Psychology F (3-0) [0.50]**

Students will examine theoretical and methodological issues in selected topic areas of industrial/organizational psychology. Selected topic areas may include diversity issues, trust and justice, job performance, employment selection, and stress and well-being. Specific topics, to be announced prior to course selection, will vary according to the interests of the instructor of the course.

*Prerequisite(s):* 14.00 credits including [PSYC\*3250, (1 of PSYC\*2070, PSYC\*3070 , PSYC\*3080 ), ( PSYC\*2040 or PSYC\*3290 ), 0.50 credits in Psychology at the 3000 level]

*Restriction(s):* Restricted to students in BAH.PSYC, BAH.PSYC:C, BAH.ISHB, BSCH.PBC, or a major or minor in Neuroscience with a minimum grade point average of 70% in all Psychology course attempts. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* Department of Psychology

**PSYC\*4460 Advanced Topics in Clinical and Applied Developmental Psychology W (3-0) [0.50]**

This course covers issues and theories in clinical or applied developmental psychology. Topics may include pediatric (child health) psychology, attachment relationships, non-suicidal self-injury, and aggression. The selected topic, to be announced prior to course selection, will vary on the basis of the expertise of the instructor.

*Prerequisite(s):* 14.00 credits including [PSYC\*3250, (PSYC\*2020 or PSYC\*3390 ), (PSYC\*2450 or PSYC\*2740), ( PSYC\*2040 or PSYC\*3290 ), 0.50 credits in Psychology at the 3000 level]

*Restriction(s):* Restricted to students in BAH.PSYC, BAH.PSYC:C, BAH.ISHB, BSCH.PBC, or a major or minor in Neuroscience with a minimum grade point average of 70% in all Psychology course attempts. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* Department of Psychology

**PSYC\*4470 Advanced Topics in Behavioural and Cognitive Neuroscience F (3-0) [0.50]**

Major areas of contemporary behavioural or cognitive neuroscience will be covered in a seminar format. Selected topic areas may include the neural basis of learning, memory, attention, sensation, and perception. The selected topic, to be announced prior to course selection, will vary on the basis of the expertise of the instructor.

*Prerequisite(s):* (PSYC\*2410, 1.50 credits in Psychology at the 3000 level) or NEUR\*2000

*Restriction(s):* Restricted to students in BAH.PSYC, BAH.PSYC:C, BAH.ISHB, BSCH.PBC, BSCH.NEUR, or a major or minor in Neuroscience with a minimum grade point average of 70% in all Psychology course attempts. and a minimum of 14.00 completed credits. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* Department of Psychology

**PSYC\*4540 Practical Applications of Psychology F,W (3-0) [1.00]**

This is a required capstone course for students in Psychology's BA and BSC Honours major programs, excepting those who are taking the Honours Thesis courses (PSYC\*4780, 4880). The course adopts a problem-based learning approach in which students will be presented with problems resembling those that they will face in their professional and personal lives. Students will apply their psychological knowledge and skills to analyze the problem, consider solutions, and communicate recommendations to hypothetical stakeholders.

*Prerequisite(s):* 14.00 credits including [PSYC\*3250, (PSYC\*3000 or 7.50 credits in Psychology ), ( PSYC\*2040 or PSYC\*3290 )]

*Restriction(s):* PSYC\*4870, PSYC\*4880. Restricted to students in BAH.PSYC, BAH.PSYC:C, BAH.ISHB, BSCH.PBC or a major or minor in Neurosciences with a minimum grade point average of 70% in all Psychology course attempts.

*Department(s):* Department of Psychology

**PSYC\*4570 Special Topics in Applied Psychology U (3-0) [0.50]**

This is an in-depth examination of specific advances in the application of psychology theory and methods. Specific topics will vary according to the expertise of the instructor.

*Prerequisite(s):* 14.00 credits including [PSYC\*3250, ( PSYC\*2040 or PSYC\*3290 ), 0.50 credits in Psychology at the 3000 level]

*Restriction(s):* Restricted to students in BAH.PSYC, BAH.PSYC:C, BAH.ISHB, BSCH.PBC or a major or minor in Neurosciences with a minimum grade point average of 70% in all Psychology course attempts.

*Department(s):* Department of Psychology

**PSYC\*4580 Special Topics in Behavioural Sciences U (3-0) [0.50]**

This course provides an in-depth examination of specific theoretical and methodological advances for understanding human and/or animal behaviour. Specific topics will vary according to the expertise of the instructor, but could include advances in Social Psychology, Industrial/Organizational Psychology, Cognitive or Behavioural Neuroscience.

*Prerequisite(s):* 14.00 credits including [( PSYC\*2040 or PSYC\*3290 ), 1.00 credits in Psychology at the 3000 level]

*Restriction(s):* Restricted to students in BAH.PSYC, BAH.PSYC:C, BAH.ISHB, BSCH.PBC or a major or minor in Neurosciences with a minimum grade point average of 70% in all Psychology course attempts.

*Department(s):* Department of Psychology

**PSYC\*4750 Seminar in Motivation and Emotion W (3-0) [0.50]**

This course provides an in-depth examination of human motivation and emotion—the neurocognitive mechanisms and corresponding subjective feelings that focus thoughts and behaviours in an adaptive way toward some objects and events in the environment and away from others. The course material and assignments will cover what is known about motivation and emotion from research in the overlapping fields of cognitive and social psychology, emotion theory, and cognitive-affective neuroscience.

*Prerequisite(s):* 14.00 credits including 1.50 credits in Psychology at the 3000 level

*Restriction(s):* Restricted to students in BAH.PSYC, BAH.PSYC:C, BAH.ISHB, BSCH.PBC, or a major or minor in Neuroscience with a minimum grade point average of 70% in all Psychology course attempts.

*Department(s):* Department of Psychology

**PSYC\*4780 Advanced Research Methods and Statistics F (3-0) [0.50]**

As a companion to honours thesis, this course focuses on advanced research methods, including qualitative methods, and statistical techniques, and presenting research in oral and written form. Topics of emphasis will be internal validity, ecological validity, and construct validity, as well as the correspondence between complex designs and the statistical techniques that can be used to analyze the data resulting from such designs. In addition to readings, lectures, and in-class exercises, students will be guided through the process of analyzing qualitative data and reporting on an empirical investigation in oral and written form.

*Prerequisite(s):* 14.00 credits including PSYC\*3250, (1 of PSYC\*2040 or PSYC\*3290 or STAT\*2050)

*Restriction(s):* Restricted to students in BAH.PSYC, BAH.PSYC:C, BAH.ISHB, BSCH.PBC, or a major or minor in Neuroscience

*Restriction(s):* PSYC\*3370 , PSYC\*3380 . Instructors consent required with a minimum cumulative average of 70% in all Psychology course attempts.

*Department(s):* Department of Psychology

**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 Course Instructor. 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).

*Prerequisite(s):* 14.00 credits including (1 of NEUR\*3500, PSYC\*3000, 7.50 credits in Psychology)

*Co-requisite(s):* NEUR\*4000 or PSYC\*4780 or ( PSYC\*3370 , PSYC\*3380 )

*Restriction(s):* PSYC\*4540. Restricted to students in BAH.PSYC, BAH.PSYC:C, BAH.ISHB, BSCH.PBC or a major or minor in Neurosciences with a minimum grade point average of 75% in all Psychology course attempts. Instructor consent required.

*Department(s):* Department of Psychology

**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.

*Prerequisite(s):* PSYC\*4870

*Restriction(s):* PSYC\*4540. Restricted to students in BAH.PSYC, BAH.PSYC:C, BAH.ISHB, BSCH.PBC or a major or minor in Neurosciences with a minimum grade point average of 75% in all Psychology course attempts. Instructor consent required.

*Department(s):* Department of Psychology

## Real Estate and Housing

*Department of Marketing and Consumer Studies, College of Business 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. Some restrictions may apply during some time periods. Please contact the department for more information.*

*Department(s): Department of Marketing and Consumer Studies*

### 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. Some restrictions may apply during some time periods. Please contact the department for more information.*

*Department(s): Department of Marketing and Consumer Studies*

### 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. Some restrictions may apply during some time periods. Please contact the department for more information.*

*Department(s): Department of Marketing and Consumer Studies*

### 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 ), (ECON\*2740 or STAT\*2060)*

*Restriction(s): This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.*

*Department(s): Department of Marketing and Consumer Studies*

### 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.*

*Department(s): Department of Marketing and Consumer Studies*

### 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.*

*Department(s): Department of Marketing and Consumer Studies*

### 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. Some restrictions may apply during some time periods. Please contact the department for more information.*

*Department(s): Department of Marketing and Consumer Studies*

### 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): (1 of CIS\*1200, CIS\*1500, MCS\*2020), (1 of ACCT\*2230, BUS\*2230 , ECON\*2560, ECON\*3560 , MCS\*2820 , REAL\*2820)*

*Equate(s): MCS\*4820*

*Restriction(s): This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.*

*Department(s): Department of Marketing and Consumer Studies*

### REAL\*4830 Real Estate Development Project W (6-0) [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.

*Prerequisite(s): 15.00 credits including REAL\*3810, REAL\*4820*

*Restriction(s): MCS\*3820 , MCS\*4810 . This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.*

*Department(s): Department of Marketing and Consumer Studies*

### 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. Some restrictions may apply during some time periods. Please contact the department for more information.*

*Department(s): Department of Marketing and Consumer Studies*

### REAL\*4870 Sustainable Real Estate F (3-0) [0.50]

This course is designed to give students an understanding of how topics in sustainability and climate change affect and are affected by real estate and urban economics. Students will develop an understanding of the reasons for and benefits of sustainability practices in real estate and planning.

*Prerequisite(s): 14.00 credits*

*Restriction(s): This is a Priority Access Course. Some restrictions may apply during some time periods. Please contact the department for more information.*

*Department(s): Department of Marketing and Consumer Studies*

## 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.

*Offering(s):* Also offered through Distance Education format.

*Department(s):* Department of Sociology and Anthropology

### 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.

*Department(s):* Department of Sociology and Anthropology

### 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

*Department(s):* Department of Sociology and Anthropology

### 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.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* SOC\*1100 or SOC\*1500

*Restriction(s):* This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations. Please see the departmental website.

*Department(s):* Department of Sociology and Anthropology

### 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

*Department(s):* Department of Sociology and Anthropology

### SOC\*2280 Society and Environment F (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

*Department(s):* Department of Sociology and Anthropology

### 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

*Department(s):* Department of Sociology and Anthropology

### 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

*Department(s):* Department of Sociology and Anthropology

### 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, filialcide, serial and mass murder.

*Offering(s):* Offered through Distance Education format only.

*Prerequisite(s):* 1 of ANTH\*1150, FRHD\*1010, PHIL\*1010, POLS\*1400, PSYC\*1000, PSYC\*1100, PSYC\*1200, SOC\*1100, SOC\*1500

*Restriction(s):* This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations. Please see the departmental website for more information.

*Department(s):* Department of Sociology and Anthropology

### 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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* SOAN\*2112, SOAN\*2120

*Department(s):* Department of Sociology and Anthropology

### 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

*Department(s):* Department of Sociology and Anthropology

### 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

*Department(s):* Department of Sociology and Anthropology

### SOC\*3380 Society and Nature W (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

*Department(s):* Department of Sociology and Anthropology

### SOC\*3410 Individual and Society W (3-0) [0.50]

This course deals with the relationship between the individual and society through close examination of social interaction in a variety of settings. Students will be exposed to a range of theories, methods and concepts from cognitive, micro, dramaturgical, and interpretive sociologies, and will learn to apply these to the analysis of personal relationships, intercultural encounters, institutional life, collective action, and everyday life-worlds.

*Prerequisite(s):* SOAN\*2112, SOAN\*2120

*Department(s):* Department of Sociology and Anthropology

### SOC\*3490 Law and Society 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.

*Prerequisite(s):* (SOAN\*2112 or SOC\*2700), SOAN\*2120

*Restriction(s):* This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations. Please see the departmental website.

*Department(s):* Department of Sociology and Anthropology

**SOC\*3710 Youth Justice 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).

*Department(s):* Department of Sociology and Anthropology

**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).

*Department(s):* Department of Sociology and Anthropology

**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).

*Department(s):* Department of Sociology and Anthropology

**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).

*Department(s):* Department of Sociology and Anthropology

**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

*Department(s):* Department of Sociology and Anthropology

**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

*Department(s):* Department of Sociology and Anthropology

**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.

*Department(s):* Department of Sociology and Anthropology

**SOC\*4010 Violence and Society F,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

*Department(s):* Department of Sociology and Anthropology

**SOC\*4030 Advanced Topics in Criminology F (3-0) [0.50]**

This is an in-depth study of selected issues in criminology.

*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.

*Department(s):* Department of Sociology and Anthropology

**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.

*Department(s):* Department of Sociology and Anthropology

**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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 12.50 credits including SOAN\*2120, SOC\*2080

*Department(s):* Department of Sociology and Anthropology

**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):* 14.00 credits including SOAN\*3070, SOAN\*3120, SOC\*3310

*Department(s):* Department of Sociology and Anthropology

**SOC\*4410 Women, Work and Public Policy F,W (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

*Department(s):* Department of Sociology and Anthropology

**SOC\*4420 Sociology of Food 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

*Department(s):* Department of Sociology and Anthropology

**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)

*Department(s):* Department of Sociology and Anthropology

**SOC\*4740 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):* 12.50 credits including SOC\*3310, SOAN\*3070, SOAN\*3120

*Department(s):* Department of Sociology and Anthropology

**SOC\*4840 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):* 12.50 credits including SOC\*3310, SOAN\*3070, SOAN\*3120

*Department(s):* Department of Sociology and Anthropology

**SOC\*4880 Special Projects in Sociology 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.

*Department(s):* Department of Sociology and Anthropology

**SOC\*4890 Special Projects in Sociology 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.

*Department(s):* Department of Sociology and Anthropology

**SOC\*4900 Honours Sociology 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 students.

*Prerequisite(s):* 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

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

*Department(s):* Department of Sociology and Anthropology

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

Completion and presentation of honours thesis.

*Prerequisite(s):* SOC\*4900

*Restriction(s):* Instructor consent required.

*Department(s):* Department of Sociology and Anthropology

## 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\*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

*Department(s):* Department of Sociology and Anthropology

#### 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

*Department(s):* Department of Sociology and Anthropology

#### 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

*Department(s):* Department of Sociology and Anthropology

#### 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

*Restriction(s):* Restricted to students in ANTH, CJPP, ID, SOC, BAG.ARTS

*Department(s):* Department of Sociology and Anthropology

#### 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

*Department(s):* Department of Sociology and Anthropology

#### 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.

*Offering(s):* Also offered through Distance Education format.

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

*Department(s):* Department of Sociology and Anthropology

#### SOAN\*3040 Globalization of Work and Organizations F (3-0) [0.50]

This course examines the social, economic, and political dimensions of work, locating work and its transformation within the broader context of globalization, economic restructuring, and shifts in public policy. Theoretical approaches and concepts used in the study of work will be introduced and critically assessed.

*Prerequisite(s):* 1 of ANTH\*2160, IDEV\*2500, SOAN\*2112

*Restriction(s):* SOAN\*2040

*Department(s):* Department of Sociology and Anthropology

#### 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

*Department(s):* Department of Sociology and Anthropology

#### SOAN\*3100 Gender Perspectives on Families and Households F (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

*Restriction(s):* FRHD\*3120

*Department(s):* Department of Sociology and Anthropology

#### 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.

*Prerequisite(s):* SOAN\*2120

*Restriction(s):* Restricted to students registered in Anthropology, Criminal Justice and Public Policy, Sociology, International Development (GAD or RAD).

*Department(s):* Department of Sociology and Anthropology

#### SOAN\*3130 Protest, Resistance, and Collective Action W (3-0) [0.50]

The course introduces students to the study of social movements and contentious collective action, looking at the motivations, tactics, outcomes of movement participants, and how these are theorized.

*Prerequisite(s):* 1 of ANTH\*2160, IDEV\*2500, SOAN\*2112

*Department(s):* Department of Sociology and Anthropology

#### 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

*Department(s):* Department of Sociology and Anthropology

#### SOAN\*3250 Social Change in Latin America W (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

*Department(s):* Department of Sociology and Anthropology

#### 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 . Registration in Anthropology, Sociology or International Development.

*Department(s):* Department of Sociology and Anthropology

#### SOAN\*4210 Indigenous-Settler Relations in Canadian Society W (3-0) [0.50]

This seminar-based course is designed to provide students with an opportunity to explore contemporary Indigenous-Settler relations in Canadian Society. Grounded in an exploration of worldviews and meaningful knowledge systems engagement, the course may explore governance, decolonisation, re-appropriation, reconciliation, etc. The specific content areas will vary depending on the instructor.

*Prerequisite(s):* 12.50 credits including (1 of ANTH\*2660, IDEV\*2500, GEOG\*2210, SOAN\*2290), (GEOG\*2260 or SOAN\*3070)

*Equate(s):* SOC\*4310

*Department(s):* Department of Sociology and Anthropology

#### 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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* 12.50 credits including (ANTH\*2160 or SOC\*2080), (SOAN\*2120 or WMST\*3000 )

*Department(s):* Department of Sociology and Anthropology

#### 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)

*Restriction(s):* SOAN\*4240

*Department(s):* Department of Sociology and Anthropology

**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)

*Department(s):* Department of Sociology and Anthropology

**SOAN\*4260 Migration, Inequality and Social Change W (3-0) [0.50]**

This seminar critically examines the complex relationships between migration, inequality and social change. Students will develop their understanding of key debates in contemporary migration, exploring relevant theory, research and public policy. Topics may include the migration-development nexus, the role of migration policies in structuring inequalities, migrant rights and resistance, and transnational families.

*Prerequisite(s):* 12.50 credits including SOAN\*2120, (1 of ANTH\*2160, IDEV\*2500, SOC\*2080)

*Department(s):* Department of Sociology and Anthropology

**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.

*Department(s):* Department of Sociology and Anthropology

**SOAN\*4500 Community Development W (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

*Department(s):* Department of Sociology and Anthropology

## Spanish

*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.

### SPAN\*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.

*Offering(s):* Also offered through Distance Education format.

*Equate(s):* HISP\*1100

*Department(s):* School of Languages and Literatures

### SPAN\*1110 Introductory Spanish II F,W (3-1) [0.50]

This is a continuation of SPAN\*1100. Students will develop and apply increased reading, writing, listening and oral skills in Spanish through the study of new vocabulary and grammatical structures and culture.

*Offering(s):* Also offered through Distance Education format.

*Equate(s):* HISP\*1110

*Department(s):* School of Languages and Literatures

### SPAN\*2000 Intermediate Spanish I F,W (3-1) [0.50]

This course is for students who have completed either first year University Spanish or 4U Spanish as well as for those who are heritage speakers. This course examines cultural topics and grammatical structures in greater depth while focusing on vocabulary acquisition, and development of oral, written, and listening skills.

*Equate(s):* HISP\*2000

*Department(s):* School of Languages and Literatures

### SPAN\*2010 Intermediate Spanish II F,W (3-1) [0.50]

Students will acquire and apply improved skills in reading, writing, and conversation through further study of grammar and culture. The course encourages students to enhance their analytical and linguistic skills through the use of appropriate structures as they formulate and support opinions.

*Prerequisite(s):* HISP\*2000 or SPAN\*2000

*Equate(s):* HISP\*2010

*Department(s):* School of Languages and Literatures

### SPAN\*2040 Culture of Spain F (3-0) [0.50]

This course is 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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* HISP\*1110 or SPAN\*1110

*Equate(s):* HISP\*2040

*Department(s):* School of Languages and Literatures

### SPAN\*2990 Hispanic Literary Studies W (3-0) [0.50]

This course is 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):* HISP\*1110 or SPAN\*1110

*Equate(s):* HISP\*2990

*Department(s):* School of Languages and Literatures

### SPAN\*3080 Spanish American Culture F (3-0) [0.50]

This course is a survey through selected readings, class discussion and audio-visual materials of the Spanish American countries, their histories, society, institutions and culture.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* HISP\*2000 or SPAN\*2000

*Equate(s):* HISP\*3080

*Department(s):* School of Languages and Literatures

### SPAN\*3210 Topics in Hispanic Studies E,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 SPAN\*3220), ( HISP\*3230 or SPAN\*3230)

*Equate(s):* HISP\*3210

*Department(s):* School of Languages and Literatures

### SPAN\*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

*Equate(s):* HISP\*3220

*Department(s):* School of Languages and Literatures

### SPAN\*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

*Equate(s):* HISP\*3230

*Department(s):* School of Languages and Literatures

### SPAN\*3240 Topics in Hispanic Linguistics W (3-0) [0.50]

This course offers an introduction to linguistic topics including history of the Spanish language, language variation and change, and Spanish phonetics, which may vary from year to year.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* ( HISP\*1110 or SPAN\*1110), (LAT\*1100, LING\*1000 are recommended)

*Equate(s):* HISP\*3240

*Department(s):* School of Languages and Literatures

### SPAN\*3500 Advanced Spanish I F (3-0) [0.50]

This is 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):* HISP\*3500

*Department(s):* School of Languages and Literatures

### SPAN\*3700 Experiential Learning and Language S,F,W (0-0) [0.50]

This course provides an opportunity for independent study based on an experiential project in Spanish or Hispanic Studies. The project (approximately 70 hours) must be approved by a faculty member in the School of Languages and Literatures. It will include research about experiential learning, a reflective piece of writing and a public oral presentation about the project.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 10.00 credits including 1.50 credits in Spanish.

*Restriction(s):* A minimum cumulative average of 70% in all Spanish course attempts. Instructor consent required.

*Department(s):* School of Languages and Literatures

### SPAN\*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 or SPAN\*3220), (HISP\*3230 or SPAN\*3230), SPAN\*3080

*Equate(s):* HISP\*3800

*Restriction(s):* Instructor consent required.

*Department(s):* School of Languages and Literatures

### SPAN\*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 or SPAN\*3220), (HISP\*3230 or SPAN\*3230), SPAN\*3080

*Equate(s):* HISP\*3810

*Restriction(s):* Instructor consent required.

*Department(s):* School of Languages and Literatures

### SPAN\*4100 Seminar in Hispanic Studies E,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 SPAN\*4410), ( HISP\*4420 or SPAN\*4420)

*Department(s):* School of Languages and Literatures

**SPAN\*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 SPAN\*4100.

*Prerequisite(s): HISP\*2990 or SPAN\*2990*

*Department(s): School of Languages and Literatures*

**SPAN\*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*

*Department(s): School of Languages and Literatures*

**SPAN\*4500 Spanish Translation - Theory and Practice W (3-0) [1.00]**

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 and English to Spanish. Students work with a variety of texts from multiple fields, including journalism, business, science and literature.

*Prerequisite(s): HISP\*3500 or SPAN\*3500*

*Equate(s): HISP\*4500*

*Department(s): School of Languages and Literatures*

**SPAN\*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 SPAN\*3220), ( HISP\*3230 or SPAN\*3230),*

*Equate(s): HISP\*4840*

*Restriction(s): Instructor consent required.*

*Department(s): School of Languages and Literatures*

## Statistics

### Department of Mathematics and Statistics

#### Suggested initial course sequences:

- For students interested in applied statistics a minimal course sequence is: (STAT\*2040 or STAT\*2100), STAT\*2050, STAT\*3210, STAT\*3240, STAT\*3320.
- 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.
- Graduate students may be admitted to later parts of a sequence by permission of the department.
- 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 (3-0) [0.50]

This course focuses on the practical methods of Statistics and the topics include: descriptive statistics; univariate models such as binomial, Poisson, uniform and normal; the 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; introduction to analysis of variance. Assignments will deal with real data from the natural sciences and involve the use of statistical software for computing and visualization.

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* 1 of 4U Calculus and Vectors, Advanced Functions and Calculus, OAC Calculus, MATH\*1080

*Restriction(s):* STAT\*2060, STAT\*2080, STAT\*2120, STAT\*2230

*Department(s):* Department of Mathematics and Statistics

### STAT\*2050 Statistics II E,W (3-0) [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):* 1 of STAT\*2040, STAT\*2060, STAT\*2120, STAT\*2230

*Restriction(s):* STAT\*2090

*Department(s):* Department of Mathematics and Statistics

### STAT\*2060 Statistics for Business Decisions F,W (3-0) [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.

*Offering(s):* 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.

*Department(s):* Department of Mathematics and Statistics

### STAT\*2080 Introductory Applied Statistics I F (3-0) [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. BSC students cannot take this course for credit.

*Department(s):* Department of Mathematics and Statistics

### STAT\*2090 Introductory Applied Statistics II W (3-0) [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

*Department(s):* Department of Mathematics and Statistics

### STAT\*2120 Probability and Statistics for Engineers F,W (3-0) [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):* 1 of IPS\*1510, MATH\*1210, MATH\*2080

*Restriction(s):* STAT\*2040, STAT\*2060, STAT\*2080, STAT\*2100

*Department(s):* Department of Mathematics and Statistics

### STAT\*2230 Biostatistics for Integrative Biology W (3-2) [0.50]

This course introduces students to the design, completion and interpretation of research projects, including identifying categories of research questions, types of data, data gathering methods, efficient graphic and numeric methods to summarize data, standard statistical analyses involving parameter estimation and hypothesis tests and interpreting results in the context of research goals. Statistical concepts underlying practical aspects of biological research will be emphasized. Computer-intensive laboratory sessions will focus on practical data organization, visualization, statistical analysis using software, and interpretation and communication of statistical results.

*Prerequisite(s):* BIOL\*1070

*Restriction(s):* BIOL\*2250, STAT\*2040, STAT\*2060, STAT\*2080, STAT\*2120, STAT\*2250. Restricted to students in the BSC majors in BIOD, MFB, WBC, WLB, and ZOO, and BSES majors in ECOL and ECOL:C.

*Department(s):* Department of Mathematics and Statistics, Department of Integrative Biology

### 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):* (1 of IPS\*1510, MATH\*1210, MATH\*2080), (STAT\*2040 or STAT\*2120)

*Department(s):* Department of Mathematics and Statistics

### 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

*Department(s):* Department of Mathematics and Statistics

### STAT\*3210 Experimental Design F (3-0) [0.50]

This course presents the basic principles of design: randomization, replication, and local control (blocking); RCB, 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.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* STAT\*2050

*Department(s):* Department of Mathematics and Statistics

### STAT\*3240 Applied Regression Analysis F (3-1) [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):* (1 of IPS\*1510, MATH\*1210, MATH\*2080), (1 of MATH\*1160, MATH\*2150, MATH\*2160), STAT\*2050

*Department(s):* Department of Mathematics and Statistics

### 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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* (1 of IPS\*1510, MATH\*1210, MATH\*2080), (1 of STAT\*2050, STAT\*3240, STAT\*3100)

*Department(s):* Department of Mathematics and Statistics

**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):* STAT\*2050

*Department(s):* Department of Mathematics and Statistics

**STAT\*4000 Statistical Computing F (3-0) [0.50]**

The topics in this course will include pseudorandom number generation, numerical optimization as used in statistics, simulation study design, Monte Carlo integration and variance reduction, and bootstrapping. Other topics may include permutation tests, visualization of multivariate data, and big data.

*Prerequisite(s):* MATH\*2130, STAT\*2050, STAT\*3110

*Department(s):* Department of Mathematics and Statistics

**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.

*Offering(s):* Offered in odd-numbered years.

*Prerequisite(s):* STAT\*3110, STAT\*3240

*Department(s):* Department of Mathematics and Statistics

**STAT\*4060 Topics in Applied Statistics II F (3-0) [0.50]**

Same as for STAT\*4050.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* STAT\*3110, STAT\*3240

*Department(s):* Department of Mathematics and Statistics

**STAT\*4150 Topics in Applied Statistics III F,W (3-0) [0.50]**

In this course students will discuss selected topics at an advanced level as in STAT\*4050, but with different choice of topics.

*Prerequisite(s):* STAT\*3110, STAT\*3240

*Department(s):* Department of Mathematics and Statistics

**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

*Department(s):* Department of Mathematics and Statistics

**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):* (1 of MATH\*1160, MATH\*2150 , MATH\*2160 ), STAT\*3110, STAT\*3240

*Department(s):* Department of Mathematics and Statistics

**STAT\*4360 Applied Time Series Analysis F (3-0) [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

*Department(s):* Department of Mathematics and Statistics

**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.

*Department(s):* Department of Mathematics and Statistics

## 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 ( ARTH\*1220 or ARTH\*2200 ), (ARTH\*1510 or ARTH\*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, readings and a field trip 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 the 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.*

*Department(s): School of Fine Art and Music*

### 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 the 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.*

*Department(s): School of Fine Art and Music*

### 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.

*Offering(s): Offered through Distance Education format only.*

*Department(s): School of Fine Art and Music*

### SART\*2090 Drawing I F,W (0-6) [0.50]

This course will consider the activity of drawing as an ability to work with a varied range of applications – all of them concerned with the investigation and development of idea through making an image. This course is an introduction to the basic concepts, techniques and media of drawing, through disciplined observational and imaginative study.

*Prerequisite(s): (1 of ARTH\*1220 , ARTH\*1510, ARTH\*1520), SART\*1050, SART\*1060*

*Co-requisite(s): SART\*1060 can be taken as co-requisite*

*Restriction(s): This is a Priority Access Course. Enrolment may be restricted to particular programs, specializations, majors or semester levels during certain periods. Please see the department for more information.*

*Department(s): School of Fine Art and Music*

### SART\*2200 Painting I F,W (0-6) [0.50]

This course is designed to introduce students to the fundamentals of observational painting in oil and acrylic paint. In addition to developing skill in colour-mixing, composition, and using value to create space and form, students will learn proper care for tools and how to prepare supports. Regular discussions of contemporary and relevant historical examples will assist students to understand their work as part of the broader conversation and discourse in painting. Prior or concurrent Drawing classes are recommended.

*Prerequisite(s): (1 of ARTH\*1220 , ARTH\*1510, ARTH\*1520), SART\*1050, SART\*1060*

*Co-requisite(s): SART\*1060 can be taken as co-requisite*

*Restriction(s): This is a Priority Access Course. Enrolment may be restricted to particular programs, specializations, majors or semester levels during certain periods. Please see the department for more information.*

*Department(s): School of Fine Art and Music*

### SART\*2300 Sculpture I F,W (0-6) [0.50]

This course is an introduction to contemporary sculptural concerns through hands-on projects and historical readings. Students will be actively engaged in exploring a variety of materials and ideas including modular construction, scale and soft sculpture.

*Prerequisite(s): (1 of ARTH\*1220 , ARTH\*1510, ARTH\*1520), SART\*1050, SART\*1060*

*Co-requisite(s): SART\*1050 can be taken as co-requisite*

*Restriction(s): This is a Priority Access Course. Enrolment may be restricted to particular programs, specializations, majors or semester levels during certain periods. Please see the department for more information.*

*Department(s): School of Fine Art and Music*

### SART\*2460 Printmaking I F (0-6) [0.50]

This course is an introduction to the printmaking media of intaglio, relief and silkscreen. Conceptual issues will be examined in relation to the creation of prints with discussions around the characteristics of the edition, the monoprint and the series through printmaking objects and readings.

*Prerequisite(s): (1 of ARTH\*1220 , ARTH\*1510, ARTH\*1520), SART\*1050, SART\*1060*

*Co-requisite(s): SART\*1060 can be taken as co-requisite*

*Restriction(s): This is a Priority Access Course. Enrolment may be restricted to particular programs, specializations, majors or semester levels during certain periods. Please see the department for more information.*

*Department(s): School of Fine Art and Music*

### SART\*2610 Photography I F,W (0-6) [0.50]

This course is an introduction to the historic, conceptual, and material nature of photography in contemporary art. Course content will include basic digital, analogue and studio techniques, and an exploration of historic techniques such as the Photogram and Camera Obscura. Readings, discussions, and assignments will forge connections between historic and contemporary modes of image making, and will encourage students to experiment with innovative ways of utilizing the photographic medium.

*Prerequisite(s): (1 of ARTH\*1220 , ARTH\*1510, ARTH\*1520), SART\*1050, SART\*1060*

*Co-requisite(s): SART\*1060 can be taken as co-requisite*

*Restriction(s): This is a Priority Access Course. Enrolment may be restricted to particular programs, specializations, majors or semester levels during certain periods. Please see the department for more information.*

*Department(s): School of Fine Art and Music*

### SART\*2700 Digital Media I F (0-6) [0.50]

This course provides an in-depth introduction to the image making possibilities in digital media. Students will learn various methods of drawing vector-based imagery and compositing raster images. A final assignment will provide an opportunity for students to learn the fundamental languages required to display content for the World Wide Web and offer an opportunity to combine both vector and raster based imagery. Some computer experience is recommended.

*Prerequisite(s): (1 of ARTH\*1220 , ARTH\*1510, ARTH\*1520), SART\*1050, SART\*1060*

*Co-requisite(s): SART\*1060 can be taken as co-requisite*

*Restriction(s): This is a Priority Access Course. Enrolment may be restricted to particular programs, specializations, majors or semester levels during certain periods. Please see the department for more information.*

*Department(s): School of Fine Art and Music*

### SART\*2710 Digital Media II W (0-6) [0.50]

This course continues digital drawing on the computer, specifically, translating traditional media into more complex raster and vector images through a number of directed projects. Readings covering relevant principles and theories will form a critical supplement to the course. Some computer experience is recommended

*Prerequisite(s): (1 of ARTH\*1220 , ARTH\*1510, ARTH\*1520), SART\*1050, SART\*1060*

*Co-requisite(s): SART\*1060 can be taken as co-requisite*

*Restriction(s): This is a Priority Access Course. Enrolment may be restricted to particular programs, specializations, majors or semester levels during certain periods. Please see the department for more information.*

*Department(s): School of Fine Art and Music*

**SART\*2800 Extended Practices I F,W (0-6) [0.50]**

This course introduces students to different processes used by the contemporary studio artist, with an emphasis on time-based and interdisciplinary forms of production. Students will be actively engaged in exploring a variety of skills, material processes and concepts, including basic techniques in video, audio and forms of production such as the artist multiple, work which is site-specific and other strategies of conceptual art. An understanding of the technical and theoretical concerns found in contemporary art will provide a solid base for upper level courses, where students will develop a stronger capacity to experiment with media that are appropriate to realize their ideas.

*Prerequisite(s):* (1 of ARTH\*1220 , ARTH\*1510, ARTH\*1520), SART\*1050, SART\*1060

*Co-requisite(s):* SART\*1050 can be taken as co-requisite

*Restriction(s):* This is a Priority Access Course. Enrolment may be restricted to particular programs, specializations, majors or semester levels during certain periods. Please see the department for more information.

*Department(s):* School of Fine Art and Music

**SART\*3090 Drawing II F,W (0-6) [0.50]**

This course attempts to foster understanding of the basis and technical issues necessary to the making of drawings while introducing the philosophical and critical issues related to the discipline. This course will consider drawing as an activity with a wide range of applications.

*Prerequisite(s):* SART\*2090

*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.

*Department(s):* School of Fine Art and Music

**SART\*3200 Painting II F,W (0-6) [0.50]**

In this course, technical, aesthetic and philosophical issues central to contemporary painting will be investigated. These include diverse approaches to representational painting today as well as an introduction to abstraction and other non-representational strategies. Activities such as class discussions, field trips and presentations on contemporary artists will assist students to situate their own developing practices within the field.

*Prerequisite(s):* SART\*2200

*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.

*Department(s):* School of Fine Art and Music

**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):* SART\*2300

*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.

*Department(s):* School of Fine Art and Music

**SART\*3470 Printmaking and Photo/Digital Technologies F (0-6) [0.50]**

This course will introduce the use of contemporary digital imaging for printmaking applications in etching, silkscreen and lithography. File preparation, film input, digital prints and mixed media approaches will be covered. Conceptual issues will be examined in relation to the creation of prints with discussions around the use of digital files and output as a source for printmaking.

*Prerequisite(s):* SART\*2460

*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.

*Department(s):* School of Fine Art and Music

**SART\*3480 Digital Media III F (0-6) [0.50]**

This course introduces students to key approaches behind the design, development, and delivery of a modern website. Areas of focus may include: composition, HTML and Cascading Style Sheets (CSS) code, and website integration with social media. Students will work towards creating a fully functional final website to be made available online for public engagement.

*Prerequisite(s):* SART\*2700 or SART\*2710

*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.

*Department(s):* School of Fine Art and Music

**SART\*3600 Digital & Non-Silver Photography W (0-6) [0.50]**

This course combines non-silver and digital photographic methods as the basis for an aesthetic investigation into the formal, conceptual, technical and theoretical issues related to historic and new technologies in photographic practice. Course content will include non-silver printing such as Platinum/Palladium, large format photography, and an exploration of scale in digital photographic production. In-class discussions, readings and seminars are designed to provide students with a critical and historical understanding of the art-making process.

*Prerequisite(s):* SART\*2610

*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.

*Department(s):* School of Fine Art and Music

**SART\*3660 Printmaking II F,W (0-6) [0.50]**

This course provides an introduction to stone lithography and will continue to investigate the formal and technical aspects of printmaking techniques covered in SART\*2460. Students will be actively engaged in exploring contemporary concerns in printmaking through ideas of dissemination, sequence and systems through scrutiny of printmaking objects and readings.

*Prerequisite(s):* SART\*2460

*Restriction(s):* SART\*3450

*Department(s):* School of Fine Art and Music

**SART\*3750 Photography II F,W (0-6) [0.50]**

This course encourages visual problem solving and analytical skills within an experimental and exploratory studio arts practice. Course material is presented through lectures, labs, and critiques to engage with the form, content and technical attributes of the medium. Scale, electronic flash lighting, medium format photography, and darkroom printing will be covered. In-class discussions, readings and seminars are designed to provide students with a critical and historical understanding of the art-making process.

*Prerequisite(s):* SART\*2610

*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.

*Department(s):* School of Fine Art and Music

**SART\*3770 Extended Practices II F,W (0-6) [0.50]**

This course examines a number of different contemporary art forms. Students will explore and consider ideas surrounding the found object, the use of language and text in art, the theory of the dérive and appropriation. Students will continue developing their technical skills in video and sound production and are encouraged to explore such forms as collage, assemblage, the artist book and/or multiple, performance, relational art, and other avant-garde and contemporary art strategies. Critical readings will introduce students to the issues around these alternative forms of production. Class discussions will provide an opportunity for the student to engage and develop an understanding of related theoretical terms and concepts.

*Prerequisite(s):* SART\*2800

*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.

*Department(s):* School of Fine Art and Music

**SART\*3800 Experiential Learning I S,F,W (0-6) [0.50]**

This is an independent study course based on Studio Art-related practical experience. Evaluation will be based on assignments related to work duties. Written proposals, signed by the supervisor and a faculty member, 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 Summer or 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 with an average of 70% in all ARTH and SART course attempts. Instructor consent required.

*Department(s):* School of Fine Art and Music

**SART\*3900 Experiential Learning II S,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 supervisor and a faculty member, 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 Summer or 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.

*Restriction(s):* Instructor consent required.

*Department(s):* School of Fine Art and Music

**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 art form. Drawings will be made and discussed with attention to semiotic theory in order to examine the production and interpretation of meaning.

*Prerequisite(s):* SART\*3090

*Restriction(s):* Registration is limited to students registered in the Studio Art Major with an average of 70% in all ARTH and SART course attempts. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* School of Fine Art and Music

**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. In this course drawings will continue to be considered in the light of semiotic theory in order to examine the production and interpretation of meaning.

*Prerequisite(s):* SART\*4090

*Restriction(s):* Registration is limited to students registered in the Studio Art Major with an average of 70% in all ARTH and SART course attempts. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* School of Fine Art and Music

**SART\*4200 Painting III F (0-6) [0.50]**

This course focuses on experimentation as a means to investigate the possibilities available to a contemporary painter. Representational and non-representational approaches will continue to be explored, with emphasis on the development of the student's own research interests. Critical readings, in-class discussions and gallery visits help position their research within the discourse. Paintings will be analyzed with attention to semiotic theory in order to examine the production and interpretation of meaning.

*Prerequisite(s):* SART\*3200,

*Restriction(s):* Registration is limited to students registered in the Studio Art Major with an average of 70% in all ARTH and SART course attempts. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* School of Fine Art and Music

**SART\*4240 Painting IV W (0-6) [1.00]**

This capstone course offers advanced investigations into the theory and practice of painting, with strong emphasis on the development of a critically informed and engaged individual painting practice. Studio work is supplemented with critical readings and a gallery field trip. Students collaborate to mount an exhibition of their work at the end of the semester.

*Prerequisite(s):* SART\*4200

*Restriction(s):* Registration is limited to students registered in the Studio Art Major with an average of 70% in all ARTH and SART course attempts. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* School of Fine Art and Music

**SART\*4250 Special Topics in Painting and Drawing W (0-6) [0.50]**

This is a variable-content advanced course where topics change every year and each allows for in-depth focus on a specific theme, subject or technique of interest to both painting and drawing students. Studio work will be supported by readings in contemporary theory and criticism and lectures on pertinent artists. The emphasis is on contemporary approaches to artmaking.

*Prerequisite(s):* SART\*3090 or SART\*3200

*Restriction(s):* Registration is limited to students registered in the Art History specialization or Studio Art Major with an average of 70% in all ARTH and SART course attempts. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* School of Fine Art and Music

**SART\*4260 Special Topics in Painting and Drawing W (0-6) [0.50]**

This is a variable-content advanced course where topics change every year and each allows for in-depth focus on a specific theme, subject or technique of interest to both painting and drawing students. Studio work will be supported by readings in contemporary theory and criticism and lectures on pertinent artists. The emphasis is on contemporary approaches to artmaking.

*Prerequisite(s):* SART\*3090 or SART\*3200

*Restriction(s):* Registration is limited to students registered in the Art History specialization or Studio Art Major with an average of 70% in all ARTH and SART course attempts. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* School of Fine Art and Music

**SART\*4300 Sculpture III F,W (0-6) [0.50]**

Contemporary issues in sculpture will be addressed through studio assignments, and independent work undertaken 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 Studio Art Major with an average of 70% in all ARTH and SART course attempts. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* School of Fine Art and Music

**SART\*4330 Senior Sculpture F,W (0-6) [1.00]**

In this course the student will produce major works with attention to conceptual acuity and material competence, in close consultation with the instructor. 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 with an average of 70% in all ARTH and SART course attempts. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* School of Fine Art and Music

**SART\*4410 Printmaking III F (0-6) [0.50]**

Contemporary issues in printmaking will be addressed through studio projects, readings and independent work in close consultation with the instructor. Interdisciplinary projects will be encouraged using any of the techniques studied in printmaking to this point. Conceptual approaches, including prints and installation, modular and sculptural applications can be explored.

*Prerequisite(s):* SART\*3660 or (3 of SART\*2460, SART\*2470 , SART\*3410 , SART\*3450 , SART\*3470)

*Restriction(s):* Registration is limited to students registered in the Studio Art Major with an average of 70% in all ARTH and SART course attempts. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* School of Fine Art and Music

**SART\*4470 Printmaking IV W (0-6) [1.00]**

This course focuses on independent work with an emphasis on an experimental use of printmaking media. Students will continue to investigate digital and traditional printmaking methods. There will be greater emphasis on the critical issues relevant to printmaking with attention to clarity of personal statement, originality and professionalism both in studio practice and discussion.

*Prerequisite(s):* SART\*4410

*Restriction(s):* Registration is limited to students registered in the Studio Art Major with an average of 70% in all ARTH and SART course attempts. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* School of Fine Art and Music

**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 with an average of 70% in all ARTH and SART course attempts.

*Department(s):* School of Fine Art and Music

**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 with an average of 70% in all ARTH and SART course attempts.

*Department(s):* School of Fine Art and Music

**SART\*4700 Photography III F (0-6) [0.50]**

This course offers some directed projects, but also provides students with the opportunity to generate, sustain, and complete a self-directed body of work. Students will explore various approaches to historical and contemporary modes of photography, with an emphasis on experimental, hybrid, and material-based approaches to the medium. An emphasis will be placed on conceptual development, exploring the interaction of formal and representational concerns within the practice of photography.

*Prerequisite(s):* SART\*3600 or SART\*3750

*Restriction(s):* Registration is limited to students registered in the Studio Art Major with an average of 70% in all ARTH and SART course attempts. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* School of Fine Art and Music

**SART\*4720 Photography IV W (0-6) [1.00]**

This course will emphasize research, problem solving, technical experimentation, and material and aesthetic project development. Students can choose to work with black and white, colour, non-silver, digital or hybrid photographic techniques in order to produce a body of work for exhibition. Opportunities for interdisciplinary approaches to photographic practice and independent and sustained research methodologies will be encouraged. The course will also cover professional skills, such as how to write an artist statement, how to apply for funding, and how to organize, curate and install a group exhibition.

*Prerequisite(s):* SART\*4700

*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. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* School of Fine Art and Music

**SART\*4750 Specialized Studio Practice I F (0-6) [1.00]**

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 0.50 credits at the 4000-level in Studio Arts, a minimum cumulative average of at least 80% in SART courses and ARTH courses, 6.50 credits in SART and ARTH.

*Restriction(s):* Instructor consent required. Selection is by a process of portfolio submission and interview.

*Department(s):* School of Fine Art and Music

**SART\*4760 Specialized Studio Practice II W (0-6) [1.00]**

This course is a continuation of SART\*4750.

*Prerequisite(s):* SART\*4750

*Restriction(s):* Instructor consent required. Selection for entry into SART\*4750 is by a process of portfolio submission and interview.

*Department(s):* School of Fine Art and Music

**SART\*4800 Special Topics in Sculpture W (0-6) [0.50]**

This is an advanced course which focuses on a specific topic, concept 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, digital media, public art, mold making, and installation.

*Prerequisite(s):* SART\*3300

*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.

*Department(s):* School of Fine Art and Music

**SART\*4810 Extended Practices III W (0-6) [0.50]**

This course will give students an opportunity to identify and focus on a particular issue or issues found within the broad scope of different approaches to contemporary art. Thematic projects may include an examination that repositions the artist as curator, collector, documentarian, researcher, activist, historian, etc. Students will be encouraged to consider various forms or a combination of different disciplines that reflect the diversity by which artists view their own production in relation to other forms of production in society. One self-directed project based on the students' own research and in close consultation with the instruction will give the student a solid grounding on how to pursue more focused independent projects.

*Prerequisite(s):* 1 of SART\*3770, SART\*4660, SART\*4670

*Restriction(s):* Registration is limited to students registered in the Studio Art Major with an average of 70% in all ARTH and SART course attempts. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* School of Fine Art and Music

**SART\*4870 Special Topics in Sculpture W (0-6) [0.50]**

This is an advanced course which focuses on a specific topic, concept 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, digital media, public art, mold making, and installation.

*Prerequisite(s):* SART\*3300

*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.

*Department(s):* School of Fine Art and Music

**SART\*4880 Extended Practices IV W (0-6) [1.00]**

In this course, students produce two self-directed projects centered on their own research, in close consultation with the instructor. Students will engage in professional activities common to the practicing artist such that support their production such as presentations, writing proposals for grants and composing an artist statement. In this course students will begin to focus more closely on finding ways to theorize their production. Articulating their concerns and area of research through writing and speech to different audiences can provide an effective way to deepen the experience of the work.

*Prerequisite(s):* 1 of SART\*4660, SART\*4670, SART\*4810

*Restriction(s):* Registration is limited to students registered in the Studio Art Major with an average of 70% in all ARTH and SART course attempts. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* School of Fine Art and Music

**SART\*4890 Digital Media IV W (0-6) [1.00]**

This course examines the intellectual and creative ethic of the Internet and considers the realities of establishing an art practice in a culture of instant gratification and overwhelming interruptions. Informed by course readings and self-directed research, students create multimedia projects that engage the Internet as a distinct contemporary medium.

*Prerequisite(s):* SART\*3480

*Restriction(s):* Registration is limited to students registered in the Studio Art Major with an average of 70% in all ARTH and SART course attempts. This is a Priority Access Course. Some restrictions may apply during some time periods.

*Department(s):* School of Fine Art and Music

## 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*3600	[0.50]	Directed Readings
THST*3630	[0.50]	Special Studies in Studio Practice
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 Performance F,W (3-0) [0.50]

This course functions as a foundation for the study of theatre, performance, and media. Students will be introduced to the formative terms and theories of theatre, performance, and media as an academic discipline and to the conceptual and social terms of theatre and media as cultural practices. This course includes attendance at performances.

*Department(s): School of English and Theatre Studies*

### THST\*1190 Theatre Workshop I W (3-2) [0.50]

This course provides a fundamental introduction to the processes of theatrical production, with practical application and study of the analytic, creative and technical skills that bring an idea to life on the stage. Students will learn how to analyze a playscript from the perspective of the director, actor, designer and technician and will also be introduced to the fundamentals of theatre technology, scene study and production decision-making.

*Co-requisite(s): THST\*1040*

*Department(s): School of English and 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.

*Department(s): School of English and Theatre Studies*

### THST\*1270 Theatre Research I W (3-0) [0.50]

This course introduces students to scholarly research and writing in the discipline of Theatre Studies through variable-topic theoretical inquiry and secondary research. Emphasis will be placed the application of theory to analysis, the use of evidence, the development a research question and the practice of scholarly writing.

*Restriction(s): THST\*1150*

*Department(s): School of English and Theatre Studies*

### THST\*2050 Devising W (2-3) [0.50]

This course introduces students to the play creation techniques of devising, in which the script is generated collaboratively by the creative team (performers, directors, designers and dramaturges) in the rehearsal process. Students work collaboratively on demonstration exercises including physicalization, visualization, improvisation, and scripting, culminating in rehearsing and performing original material. Significant attention is paid to creative and collaborative problem solving in this studio course.

*Prerequisite(s): THST\*1040, THST\*1190*

*Restriction(s): THST\*2080 Restricted to students in a Theatre Studies specialization.*

*Department(s): School of English and Theatre Studies*

### THST\*2120 Writing for Performance F (3-0) [0.50]

This course is a theoretical and applied study of creative writing for performance.

*Prerequisite(s): THST\*1040*

*Department(s): School of English and Theatre Studies*

### THST\*2190 Theatre Workshop II F (3-2) [1.00]

This course is an intensive study of the methods of theatrical production, organized around a creative project. Students will rotate through modules focusing on skill development in the areas of acting, design, costumes, sets, lights, sound, media and stage management. Depending on the scale of the production and the class size, this course may be co-taught with Theatre Workshop III. Students in the course may undertake performance or production roles in a public performance.

*Prerequisite(s): THST\*1040, THST\*1190*

*Restriction(s): THST\*2230 Restricted to students in a Theatre Studies specialization.*

*Department(s): School of English and Theatre Studies*

### THST\*2270 Theatre Research II W (3-0) [0.50]

This variable content course will introduce students to aspects of the practice of scholarly research in relation to theatre studies. Students will be encouraged to consider resources and materials available to scholars of theatre and be introduced to the conventions of scholarly writing in theatre studies.

*Prerequisite(s): THST\*1270*

*Restriction(s): THST\*3540 , THST\*3550 , THST\*3650 , THST\*3660 Restricted to students in a Theatre Studies specialization.*

*Department(s): School of English and Theatre Studies*

### 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.

*Offering(s): Offered in even-numbered years.*

*Prerequisite(s): THST\*1200*

*Department(s): School of English and Theatre Studies*

### 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*

*Department(s): School of English and Theatre Studies*

### 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.

*Offering(s): Offered in odd-numbered years.*

*Prerequisite(s): 2.00 credits*

*Department(s): School of English and Theatre Studies*

### THST\*3000 Experiential Learning S,F,W (3-0) [0.50]

Under the supervision of a faculty member, students in this course will be placed in experiential learning situations at the university or in the wider community where they will support a community or academic project. Students will be required to become familiar with the goals and procedures of the project, to frame and articulate learning objectives, and to express in writing their learning outcomes. Depending on the placement, a police record check may be required in order to placed. Please consult with the Theatre Studies website for further information on experiential learning opportunities. <https://www.uoguelph.ca/sets/theatre-studies/ba>

*Prerequisite(s): 7.50 credits, including THST\*2050, THST\*2190*

*Restriction(s): Restricted to students in a Theatre Studies specialization. Instructor consent required.*

*Department(s): School of English and Theatre Studies*

### THST\*3010 Experiential Learning S,F,W (3-0) [0.50]

Under the supervision of a faculty member, students in this course will be placed in experiential learning situations at the university or in the wider community where they will support a community or academic project. Students will be required to become familiar with the goals and procedures of the project, to frame and articulate learning objectives, and to express in writing their learning outcomes. Depending on the placement, a police record check may be required in order to placed. Please consult with the Theatre Studies website for further information on experiential learning opportunities. <https://www.uoguelph.ca/sets/theatre-studies/ba>

*Prerequisite(s): 7.50 credits, including THST\*2050, THST\*2190*

*Restriction(s): Restricted to students in a Theatre Studies specialization. Instructor consent required.*

*Department(s): School of English and Theatre Studies*

### THST\*3140 Performance and the Past W (3-0) [0.50]

This variable content course focuses on a selected area of theatre history. Students will be encouraged to integrate primary and secondary materials in a presentation of research findings which may take a range of forms including an essay, media or theatrical presentation.

*Prerequisite(s): 7.50 credits, including THST\*1040*

*Restriction(s): THST\*2010*

*Department(s): School of English and Theatre Studies*

**THST\*3170 Special Topics F (3-0) [0.50]**

This course provides students with the opportunity to work intensively in an area of theatre work in a project defined by faculty research. The material and topic will vary but the course will consistently engage with an area of creative practice, such as scenography and design, directing, acting studio or playwriting. This course may be offered as a performance-centered studio, a design studio workshop, or a playwriting seminar, depending on the instructor. Consult the Theatre Studies website for more information on a specific iteration of the course.

*Prerequisite(s):* 7.50 credits, including THST\*2270

*Restriction(s):* THST\*3540, THST\*3550, THST\*3620, THST\*3650, THST\*3660, THST\*3850 Restricted to students in a Theatre Studies specialization.

*Department(s):* School of English and Theatre Studies

**THST\*3190 Theatre Workshop III F (3-2) [1.00]**

Students in this course will undertake the design, technical production and performance of a fully realized theatrical production. All production assignments (cast, technical crews, front of house, dramaturgy, assistant director, assistant designer) will be drawn from students enrolled in the course and in cooperation with senior students enrolled in THST\*4500. The course will be taught as a workshop with skill-specific modules, out-of-class rehearsals, and technical training crew calls. Depending on the scale of the production and the class enrolments, this course may be co-taught with THST\*2190.

*Prerequisite(s):* 7.50 credits, including THST\*2190

*Restriction(s):* THST\*3080, THST\*3110, THST\*3120, THST\*3220, THST\*3230 Restricted to students in a Theatre Studies specialization.

*Department(s):* School of English and Theatre Studies

**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 (1 of THST\*2010, THST\*3140, 1.00 credits in English)

*Department(s):* School of English and Theatre Studies

**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 (1 of THST\*3080, THST\*3110, THST\*3190)

*Co-requisite(s):* THST\*3260

*Restriction(s):* Instructor consent required.

*Department(s):* School of English and Theatre Studies

**THST\*3500 Performance Praxis I W (3-2) [0.50]**

Students will collaborate in the exploration of theory and creative practice in a project-based course. The projects may be theatrical or media-based, or an integration of both depending on the iteration of the course. Please consult the Theatre Studies website for more information.

*Prerequisite(s):* THST\*2050, THST\*2270

*Restriction(s):* THST\*3430, THST\*3460, THST\*3480, THST\*3550, THST\*3700 Restricted to students in a Theatre Studies major or minor.

*Department(s):* School of English and Theatre Studies

**THST\*3530 Canadian Cinema F (2-3) [0.50]**

This course is designed to give the student knowledge and understanding of Canadian film and film makers.

*Offering(s):* Offered in even-numbered years.

*Prerequisite(s):* 7.50 credits

*Department(s):* School of English and Theatre Studies

**THST\*3600 Directed Readings U (3-0) [0.50]**

This course provides independent study opportunities 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. 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 ) or (THST\*3140, THST\*2190)], (1 of THST\*2050, THST\*2080, THST\*2120, THST\*2240 )

*Restriction(s):* Instructor consent required.

*Department(s):* School of English and Theatre Studies

**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.

*Department(s):* School of English and Theatre Studies

**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.

*Department(s):* School of English and Theatre Studies

**THST\*4240 Theatrical Organization and Culture F (3-0) [0.50]**

This course studies various models of theatrical organization such as social context, theatrical funding, board and management structures, and artistic mandates together with their implications for theatrical production and interpretation.

*Prerequisite(s):* 10.00 credits including 1.00 credits in Theatre Studies.

*Restriction(s):* THST\*3240

*Department(s):* School of English and Theatre Studies

**THST\*4270 Research Seminar I F (3-0) [0.50]**

This course is a research seminar in selected topics in media, theatre and performance. The course features variable content. Please consult the Theatre Studies website for more information.

*Prerequisite(s):* 10.00 credits, including (1 of THST\*2270, THST\*3420, THST\*3550, THST\*3650, THST\*3660 )

*Restriction(s):* THST\*4320, Restricted to students in a Theatre Studies specialization, with an average of 70% in the specialization.

*Department(s):* School of English and Theatre Studies

**THST\*4280 Ensemble Project W (6-9) [1.00]**

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\*2010 , THST\*2230 , (2 of THST\*2080 , THST\*2120, THST\*2240 ), THST\*3550 , THST\*3850 , ( THST\*3650 or THST\*3660 )] or (THST\*2190, THST\*2120, THST\*3140, THST\*3170, THST\*3500 )

*Restriction(s):* Restricted to majors in Theatre Studies who have completed a minimum of 14.00 credits with 70% cumulative average in Theatre Studies.

*Department(s):* School of English and Theatre Studies

**THST\*4290 Research Seminar II W (3-0) [0.50]**

This is an advanced research seminar in selected topics in media, theatre and performance. The course features variable content. Please consult the Theatre Studies website for more information.

*Prerequisite(s):* 10.00 credits, including THST\*4270

*Restriction(s):* THST\*4330, Restricted to students in a Theatre Studies specialization with an average of 70% in the specialization.

*Department(s):* School of English and Theatre Studies

**THST\*4500 Performance Praxis II W (3-2) [1.00]**

This course provides students with applied leadership roles in capacities such as stage managers, assistant directors, assistant designers or dramaturges and leads to a culminating public production. Students will also study the functions of these roles in production and performance. Admission is by application to the School. Refer to the Theatre Studies website for more information.

*Prerequisite(s):* THST\*3500

*Restriction(s):* THST\*3410 , THST\*3420 , THST\*4250 Restricted to students in a Theatre Studies major or minor. Instructor consent required.

*Department(s):* School of English and Theatre Studies

**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 ] or (THST\*3170 or THST\*4270)

*Restriction(s):* Instructor consent required. 70% cumulative average in Theatre Studies courses.

*Department(s):* School of English and Theatre Studies

## 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.

*Prerequisite(s):* CHEM\*1050, (1 of IPS\*1500, MATH\*1080, MATH\*1200 ), (1 of BIOL\*1040 , BIOL\*1070, BIOL\*1080, BIOL\*1090)

*Department(s):* Department of Chemistry

### 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.

*Prerequisite(s):* CHEM\*2480, BIOC\*2580, TOX\*2000 (TOX\*2000 may be taken concurrently)

*Restriction(s):* CHEM\*3430, This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations. See department for more information.

*Department(s):* Department of Chemistry

### 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. (Also listed as CHEM\*3360.)

*Offering(s):* Also offered through Distance Education format.

*Prerequisite(s):* CHEM\*1050

*Equate(s):* CHEM\*3360

*Department(s):* Department of Chemistry

### TOX\*4000 Medical Toxicology F (3-0) [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, Biomedical Toxicology and Toxicology.

*Prerequisite(s):* BIOM\*3090

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

*Department(s):* Department of Biomedical Sciences

### 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.

*Prerequisite(s):* PATH\*3610 (or equivalent)

*Department(s):* Department of Pathobiology

### TOX\*4200 Topics in Toxicology W (3-0) [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):* Restricted to students in BSCH.TOX , BSCH.TOX:C

*Department(s):* Department of Biomedical Sciences, School of Environmental Sciences

### 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.

*Prerequisite(s):* (1 of BIOC\*3570, CHEM\*3430, TOX\*3300), BIOC\*3560, ( MBG\*2020 or MBG\*2040)

*Department(s):* Department of Chemistry

### 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.

*Department(s):* Department of Chemistry

### 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.

*Department(s):* Department of Chemistry

## 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\*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.

*Co-requisite(s): All Phase 1 courses.*

*Department(s): Department of Biomedical Sciences*

### VETM\*3080 Veterinary Physiology and Biochemistry P1 (3-3) [2.00]

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.

*Co-requisite(s): All Phase 1 courses.*

*Department(s): Department of Biomedical Sciences, Department of Pathobiology*

### VETM\*3120 Veterinary Histology and General Pathology P1 (3-3) [0.75]

A lecture and laboratory course emphasizing the gross and microscopic organization of the tissues and organs of domestic animals in various physiological states. A comparative approach is used to highlight normal and abnormal gross anatomy and histology to understand how disease affects gross and microanatomical organ structure and function. The lecture and laboratory components are well integrated to provide students with an excellent hands-on experience in histology and pathology.

*Co-requisite(s): All Phase 1 courses.*

*Department(s): Department of Biomedical Sciences, Department of Pathobiology*

### 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.

*Co-requisite(s): All Phase 1 courses.*

*Department(s): Dean's Office, Ontario Veterinary College, Department of Population Medicine, Veterinary Teaching Hospital*

### 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 recognizing 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.

*Prerequisite(s): VETM\*3210*

*Co-requisite(s): All Phase 2 courses.*

*Department(s): Dean's Office, Ontario Veterinary College, Department of Population Medicine, Veterinary Teaching Hospital*

### VETM\*3390 Developmental Biology P1 (1-1) [0.50]

This course introduces key concepts of veterinary embryology, genomics, and regenerative medicine. A comparative and application-based approach is taken when presenting the course material. The focus is to present issues relevant to veterinary medicine and to apply principles and theories to veterinary practice.

*Co-requisite(s): All Phase 1 courses.*

*Department(s): Department of Biomedical Sciences*

### 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.

*Co-requisite(s): All Phase 1 courses.*

*Department(s): Department of Population Medicine*

### 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.

*Prerequisite(s): All Phase 1 courses.*

*Co-requisite(s): All Phase 2 courses.*

*Department(s): Department of Population Medicine*

### 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>).

*Co-requisite(s): All Phase 1 courses.*

*Department(s): Department of Clinical Studies*

### 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>).

*Prerequisite(s): All Phase 1 courses.*

*Co-requisite(s): All Phase 2 courses.*

*Department(s): Department of Clinical Studies*

### 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.

*Prerequisite(s): All Phase 1 courses.*

*Co-requisite(s): All Phase 2 courses.*

*Department(s): Department of Biomedical Sciences, Department of Pathobiology*

**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.

*Prerequisite(s):* All Phase 1 courses.

*Co-requisite(s):* All Phase 2 courses.

*Department(s):* Department of Biomedical Sciences, Department of Population Medicine

**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.

*Prerequisite(s):* All Phase 1 courses.

*Co-requisite(s):* All Phase 2 courses.

*Department(s):* Department of Biomedical Sciences, Department of Clinical Studies

**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.

*Prerequisite(s):* All Phase 1 courses.

*Co-requisite(s):* All Phase 2 courses.

*Department(s):* Department of Clinical Studies

**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.

*Prerequisite(s):* All Phase 2 courses.

*Co-requisite(s):* All Phase 3 courses.

*Department(s):* Dean's Office, Ontario Veterinary College, Department of Population Medicine, Veterinary Teaching Hospital

**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

*Department(s):* Department of Biomedical Sciences

**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.

*Prerequisite(s):* All Phase 2 courses.

*Co-requisite(s):* All Phase 3 courses.

*Department(s):* Department of Clinical Studies

**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>).

*Prerequisite(s):* All Phase 2 courses.

*Co-requisite(s):* All Phase 3 courses.

*Department(s):* Department of Clinical Studies, Department of Population Medicine

**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>).

*Prerequisite(s):* All Phase 2 courses.

*Co-requisite(s):* All Phase 3 courses.

*Department(s):* Department of Clinical Studies

**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>).

*Prerequisite(s):* All Phase 2 courses.

*Co-requisite(s):* All Phase 3 courses.

*Department(s):* Department of Pathobiology

**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>).

*Prerequisite(s):* All Phase 2 courses.

*Co-requisite(s):* All Phase 3 courses.

*Department(s):* Department of Pathobiology

**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>).

*Prerequisite(s):* All Phase 2 courses.

*Co-requisite(s):* All Phase 3 courses.

*Department(s):* Department of Population Medicine

**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.

*Prerequisite(s):* All Phase 2 courses.

*Co-requisite(s):* All Phase 3 courses.

*Restriction(s):* Registration in the D.V.M. Program

*Department(s):* Department of Clinical Studies

**VETM\*4610 Small Animal Stream P4 (V-V) [7.50]**

This course is for students who have selected the Small Animal Stream in Phase 4 of the DVM Program. The goal of the small animal stream course is to assist in the role transformation from veterinary student to veterinary practitioner. The course is largely experiential in structure and process where students progress through 30 weeks of core and elective rotations that provide applied learning experiences in the context of veterinary medicine.

*Prerequisite(s):* All Phase 3 courses.

*Co-requisite(s):* VETM\*4900

*Restriction(s):* Registration in the DVM program.

*Department(s):* Dean's Office, Ontario Veterinary College

**VETM\*4660 Rural Community Practice Stream P4 (V-V) [7.50]**

This course is for students who have selected the Rural Community Practice Stream in Phase 4 of the DVM Program. The goal of the rural community practice stream course is to assist in the role transformation from veterinary student to veterinary practitioner. The course is largely experiential in structure and process where students progress through 30 weeks of core and elective rotations that provide applied learning experiences in the context of veterinary medicine.

*Prerequisite(s):* All Phase 3 courses.

*Co-requisite(s):* VETM\*4900

*Restriction(s):* Registration in the DVM program.

*Department(s):* Dean's Office, Ontario Veterinary College

**VETM\*4710 Food Animal Stream P4 (V-V) [7.50]**

This course is for students who have selected the Food Animal Stream in Phase 4 of the DVM Program. The goal of the food animal stream course is to assist in the role transformation from veterinary student to veterinary practitioner. The course is largely experiential in structure and process where students progress through 30 weeks of core and elective rotations that provide applied learning experiences in the context of veterinary medicine.

*Prerequisite(s):* All Phase 3 courses.

*Co-requisite(s):* VETM\*4900

*Restriction(s):* Registration in the DVM program.

*Department(s):* Dean's Office, Ontario Veterinary College

**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.

*Prerequisite(s):* All Phase 2 courses.

*Co-requisite(s):* All Phase 3 courses.

*Department(s):* Department of Clinical Studies

**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.

*Prerequisite(s):* All Phase 1, Phase 2 and Phase 3 courses.

*Department(s):* Department of Clinical Studies

**VETM\*4920 Equine Stream P4 (V-V) [7.50]**

This course is for students who have selected the Equine Stream in Phase 4 of the DVM Program. The goal of the equine stream course is to assist in the role transformation from veterinary student to veterinary practitioner. The course is largely experiential in structure and process where students progress through 30 weeks of core and elective rotations that provide applied learning experiences in the context of veterinary medicine.

*Prerequisite(s):* All Phase 3 courses.

*Co-requisite(s):* VETM\*4900

*Restriction(s):* Registration in the DVM program.

*Department(s):* Dean's Office, Ontario Veterinary College

## Women's Studies

*College of Arts*

### **WMST\*1000 Introduction to Women's Studies S,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.

*Offering(s):* Also offered through Distance Education format.

*Department(s):* Dean's Office, College of Arts

### **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.

*Department(s):* Dean's Office, College of Arts

## 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\*1070

*Department(s):* Department of Integrative Biology

### 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\*1070

*Department(s):* Department of Integrative Biology

### ZOO\*3000 Comparative Histology F (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):* ZOO\*2090

*Department(s):* Department of Integrative Biology

### ZOO\*3050 Developmental Biology W (3-3) [0.50]

This course will focus on the development of vertebrates and invertebrates from fertilized egg to adult. It will examine fertilization, cell differentiation into tissues and organs, regulation of cell growth, and transmission of developmental information to the next generation. Throughout, the course will emphasize the evolutionary mechanisms that have shaped developmental patterns in animals.

*Prerequisite(s):* MBG\*2040, BIOL\*2400 is strongly recommended.

*Department(s):* Department of Integrative Biology

### ZOO\*3600 Comparative Animal Physiology I F (3-0) [0.50]

This course will examine the physiological processes that enable animals to live within a diverse range of environments. Lectures will focus on the underlying molecular and cellular events that mediate physiological processes and contribute to whole animal homeostasis, and emphasize strategies and adaptations used by different animals when influenced by various environmental conditions. Fundamental mechanisms in animal physiology such as diffusion, osmosis, feedback systems, and homeostasis will be explored in nervous, muscular, endocrine and sensory physiological systems. An associated lab course (ZOO\*3610) is available.

*Prerequisite(s):* BIOC\*2580, ZOO\*2090, (STAT\*2040 or STAT\*2230 is recommended)

*Restriction(s):* ZOO\*3200

*Department(s):* Department of Integrative Biology

### ZOO\*3610 Lab Studies in Animal Physiology I F (0-3) [0.25]

This hands-on laboratory course will provide practical experience in comparative animal physiology and complement themes covered in the lecture course (ZOO\*3600). Students will learn skills and techniques used for conducting experiments on living animals with the goal of characterizing physiological processes. Students will learn how to collect data, statistically analyze results and write formal laboratory reports.

*Prerequisite(s):* STAT\*2040 or STAT\*2230

*Co-requisite(s):* ZOO\*3600

*Restriction(s):* ZOO\*3200

*Department(s):* Department of Integrative Biology

### ZOO\*3620 Comparative Animal Physiology II W (3-0) [0.50]

This course will examine the physiological processes that enable animals to live within a diverse range of environments. With a focus on respiratory, cardiovascular, osmoregulatory and digestive physiological processes, the lectures will examine the underlying molecular and cellular events that mediate physiological processes and contribute to whole animal homeostasis. An associated lab course (ZOO\*3630) is available.

*Prerequisite(s):* ZOO\*3200 or ZOO\*3600

*Restriction(s):* ZOO\*3210

*Department(s):* Department of Integrative Biology

### ZOO\*3630 Lab Studies in Animal Physiology II W (0-3) [0.25]

In this hands-on laboratory course, students will apply skills and techniques to conduct experiments on living animals with the goal of characterizing physiological processes. Students will advance their writing skills through preparation of several full lab reports. The last experiment in the course is a self-directed study where students will develop hypotheses, generate and test predictions and design the experiment using tools they have learned in the course.

*Prerequisite(s):* ZOO\*3200 or ZOO\*3610

*Co-requisite(s):* ZOO\*3620

*Restriction(s):* ZOO\*3210

*Department(s):* Department of Integrative Biology

### 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):* ZOO\*2700

*Department(s):* Department of Integrative Biology

### 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):* BIOL\*2400, (STAT\*2040 or STAT\*2230)

*Department(s):* Department of Integrative Biology

### 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\*3200, HK\*2810, HK\*3940 , ZOO\*3200 , ZOO\*3210 , ZOO\*3600

*Department(s):* Department of Integrative Biology

### 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, ZOO\*2700

*Department(s):* Department of Integrative Biology

### 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 influence of aquatic environments on life styles, behavioral patterns, physiological responses, population biology and community structure. The use of niche, habitat and ecotope concepts in defining the role of fishes in representative types of aquatic ecosystems will be examined.

*Prerequisite(s):* 15.00 credits including (STAT\*2040 or STAT\*2230), ZOO\*2090

*Department(s):* Department of Integrative Biology

### ZOO\*4570 Marine Ecological Processes W (3-1) [0.50]

This course provides an advanced analysis of the physical and biogeochemical processes in the world's oceans and the dependence of biological processes on physical and chemical processes from micro- to macro-scales. Topics to be discussed include production and energy transfer within pelagic food webs, export of energy to the benthos, and structure and dynamics of marine communities.

*Prerequisite(s):* BIOL\*2060, BIOL\*3450, PHYS\*1080

*Department(s):* Department of Integrative Biology

**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):* BIOL\*2400, ZOO\*2090

*Co-requisite(s):* ZOO\*3200 or ZOO\*3600

*Department(s):* Department of Integrative Biology

**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):* 14.00 credits including ZOO\*2090

*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. Instructor consent required.

*Department(s):* Department of Integrative Biology

**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):* 15.00 credits including ZOO\*2090

*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.

*Department(s):* Department of Integrative Biology

**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):* 15.00 credits including ZOO\*2090

*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.

*Department(s):* Department of Integrative Biology