

# Course Listings

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## 230 Details of Courses

Courses taught at the University of Alberta are listed alphabetically. All courses, except those taught by Faculté Saint-Jean, are described in English.

Each course is designated by its computer abbreviation and a number. Students should use this abbreviation and number when completing any form requiring this information.

Courses are numbered according to the following system:

000-099	Pre-University
100-199	Basic Undergraduate. Normally requires no university-level prerequisites. Designed typically for students in the first year of a program.
200-299	Undergraduate. Prerequisites, if any, are normally at the 100-level. Designed typically for students in the second year of a program.
300-399	Undergraduate. Prerequisites, if any, are normally at the 200-level. Designed typically for students in the third year of a program.
400-499	Advanced Undergraduate. Prerequisites, if any, are normally at the 300-level. Designed typically for students in the fourth year of a program.
500-599	Graduate. Designated for graduate students and certain advanced or honors undergraduate students in their final year.
600-799	Graduate Courses
800-899	Special Registrations
900-999	Graduate Thesis and Project Numbers

For the purposes of program descriptions and prerequisite designation, courses numbered 100-199 are designated as Junior Courses and courses numbered 200-499 are designated as Senior Courses.

**Note:** Some exceptions to the course number system described above have been granted to the Faculty of Law and the Faculty of Medicine and Dentistry.

### Course Description Symbols and Figures

Several symbols and figures are used to indicate the type, duration, and weight of courses.

- (1) ★—Indicates “units of course weight,” and usually follows the course title. The accompanying number indicates the weight of the course as used in computing grade point averages and for meeting degree requirements.

A course which runs throughout the Fall/Winter (i.e., from September through April) is usually weighted ★6. A course that runs for only one term (i.e., Fall: from September to December, or Winter: from January through April) is usually weighted ★3. Certain courses are offered over Fall/Winter or Spring/Summer, or in one term, with weights of ★1, ★2, and ★4. These are considered as one-sixth, one-third, and two-thirds of a Fall/Winter or Spring/Summer course, respectively. Some honors and graduate courses involving research may vary in weight according to the length and difficulty of the project. Some clinical courses may vary in weight according to the length of clinical experience. Some courses, not included in the computation of grade point averages, are offered for credit only and either carry a weight of ★0, or are marked as “Credit.”

Undergraduate students who take courses offered by the Faculty of Engineering but are not registered in Engineering will have a course weight assigned for these courses according to the protocol of their home Faculty.

- (2)  $f_i$ —Denotes: “fee index,” the value used to calculate the instructional fees for each course. The fee index is multiplied by the fee index value (given in the appropriate subsection of §22.2) to give the dollar value of instructional fees for the course.

For normal courses, the fee index is twice the value of the units of course weight; for example, a course with ★3 normally has  $f_i$  6. In cases where exceptional fees considerations need to be made, the fee index is set differently by the Board of Governors.

Note that certain programs (e.g., MD, DDS, etc.) are assessed on a program fee basis for all or certain years. In these cases, the fee index calculation does not apply.

- (3) (x term, a-b-c)—These figures in parentheses give information on when the course is offered and the hours of instruction required by the course in a week, or in some cases the total time in a term.

In the case of a single-term course, the term in which the course is given is mentioned (item x). The designation “either term” means that the course may be offered either in the first term or in the second term or in each term, at the discretion of the department concerned. The designation “variable” means that the course may be taught either as a single-term or as a full-session course.

Item **a** indicates lecture hours. Item **b** indicates seminar hour(s), demonstration hours (d), clinic hours (c), or lecture-laboratory hours (L). Item **c** indicates laboratory hours. For two-term courses, the hours of instruction are the same in both terms unless otherwise indicated. The expression 3/2 means 3 hours of instruction every second week; 2s/2 means 2 seminar hours every second week.

Examples:

(first term, 3-0-3): a course taught in first term with 3 hours lecture, no seminar, and 3 hours lab per week.

(second term, 0-1s-2): a course taught in second term with no lectures, 1 seminar hour, and 2 hours of lab per week.

(either term, 3-0-0): a course taught in either first or second term, or each term, with 3 lecture hours per week, no seminar, and no lab.

(two-term, 3-0-3): a course taught over both first and second term with three lecture hours, no seminar, and three hours lab per week.

(variable, 3-0-0): a course which may be taught in either first or second term or over two terms with three lecture hours per week, no seminar, and no lab.

- (4) **Prerequisite**—This provides information on courses which must be successfully completed before registering in the more advanced course.

**Corequisite**—This provides information on courses which must be taken before or at the same time as the course described in the listing.

Note: Departments are authorized to cancel the registration of those students registered in a course offered by the department if they do not meet the prerequisite and/or corequisite requirements stated in the course description in this Calendar.

- (5) **[Department]**— This indicates the department responsible for registration for interdepartmental courses. Normally, courses will be credited to the discipline listed in the square brackets.
- (6) **Open Studies Courses**— **O** indicates a course available to students of Open Studies. **I** indicates that a course is available to Open Studies students on a delayed registration basis only (see §220.2.2).

### Important: Registration Procedures for Two-Term Courses

Students are strongly advised to refer to the Registration and Courses menu at [www.registrar.ualberta.ca](http://www.registrar.ualberta.ca) for details. Two-term courses are normally offered over two terms (either Fall/Winter or Spring/Summer). In a few instances, two-term courses are offered within a single term. In all cases these are identifiable in the Class Schedule because they consist of part A and part B (e.g., English 111A and 111B).

To successfully register in a two-term course, students, must do the following:

- register in both the part A and part B for all types of sections offered (Lectures, Labs, Seminars, etc.);
- register in the same section numbers for part A and part B of a course (e.g., Lecture A1 for both part A and part B, and Lab E3 for both part A and part B);
- register in all the appropriate sections on the same day.

All of the above must be done or the course registration is invalid and will be deleted. Invalid registrations will be deleted nightly. It is the student's responsibility to attempt the course registration again, subject to availability.

Example: A student wishes to register in ABCD 101, a two-term course. It has a lecture and a lab section. Based on the student's timetable planning, decides to take Lecture C3 and Lab C8. The student must add

In Fall Term      ABCD 101A Lec C3 and ABCD 101A Lab C8,  
and  
In Winter Term    ABCD 101B Lec C3 and ABCD 101B Lab C8.

All these sections must be added on the same day to successfully register. Otherwise the registration in ABCD 101 will be deleted overnight and the student's place in the course will be lost.

### Course Renumbering

Over the years many courses have been renumbered. Old numbers can be found within individual course listings of previous Calendar editions.

### Courses on Reserve

Courses not offered in the past four years are removed from this Calendar and placed on Reserve. These courses may be taught again in the future, in which case they would be brought back into the active Course Listings and placed in the Calendar. Information about Reserve Courses is available through the Registrar's Office, the University Secretariat, and Faculty Offices.

### Faculty Specific Regulations Regarding Courses

For specific Faculty regulations relating to courses and for a complete list of subjects taught by a Faculty, please consult the Undergraduate Programs section of the Calendar at the end of each Faculty section.

## Physical Requirements for University Courses

The University has a commitment to the education of all academically qualified students and special services are frequently provided on campus to assist disabled students.

Nevertheless, some courses make certain unavoidable demands on students with respect to the possession of a certain level of physical skill or ability if the academic objectives of the course are to be realized. In case of doubt, students are advised to contact the Department concerned and the Disabled Student Services Coordinator, Office of the Dean of Student Services.

Because support services cannot be guaranteed for all off-campus courses, instructors may be obliged to refuse registration in such courses.

## Course Availability

The following is a comprehensive course listing of all the approved courses that the University of Alberta may offer. The appearance of a course in this list does not guarantee that the course will actually be offered. The most current information on courses is available on *Bear Tracks* at <https://www.beartracks.ualberta.ca>

# 231 Course Listings

## 231.1 Abroad, Study Term, ABROD

Education Abroad Program

### Undergraduate Courses

#### ABROD 800 Study Term Abroad

★0 (*fi 0*) (either term, unassigned). This course is reserved for students who wish to maintain registration while participating in formal University of Alberta managed and approved Study Abroad programs. Students are registered in this course for each approved term of study abroad. The only fees assessed for this registration are the normal registration and transcript fees associated with the term. Students are eligible to register in the course on more than one occasion. Closed to web registration. Contact the Education Abroad Program, University of Alberta International.

## 231.2 Accounting, ACCTG

Department of Accounting, Operations, and Information Systems  
Faculty of Business

### Notes

- (1) Enrolment in all ACCTG courses, except ACCTG 300, is restricted to students registered in the Faculty of Business, or to students registered in specified programs that require Business courses to meet degree requirements and who have obtained prior approval of their Faculty.
- (2) See also Management Information Systems listing.

### Undergraduate Courses

#### ACCTG 300 Introduction to Accounting

★3 (*fi 6*) (either term, 3-0-0). Provides a basic understanding of accounting: how accounting numbers are generated, the meaning of accounting reports, and how to use accounting reports to make decisions. Note: Not open to students registered in the Faculty of Business. Not for credit in the Bachelor of Commerce Program.

#### ACCTG 311 Introduction to Accounting for Financial Performance

★3 (*fi 6*) (either term, 3-1.5s-0). How to prepare and interpret financial statements that report to decision makers external to the enterprise, such as shareholders and creditors. Course includes principles and standards of balance sheet valuation, income measurement, financial disclosure and cash flow analysis that link preparation and use of such statements. Prerequisites: ECON 101 and 102.

#### ACCTG 322 Introduction to Accounting for Management Decision Making

★3 (*fi 6*) (either term, 3-0-0). In contrast to the external orientation of ACCTG 311, this course focuses on how to prepare and use accounting information for management decision making. Major topics include: the role of corporate goals, planning and control concepts, how costs behave and how to analyze and manage them, budgeting and performance measures. Prerequisite: ACCTG 311.

#### ACCTG 412 Financial Reporting for Managers and Analysts

★3 (*fi 6*) (either term, 3-0-0). Course is for students who are not accounting majors and is especially useful for those contemplating a career in financial management or a CFA designation. It is for students who want to build on the financial accounting knowledge developed in ACCTG 311, and provides the

necessary foundation for courses in financial statement analysis and tax. Further depth is provided in balance sheet valuation, income measurement, earnings per share and cash flow analysis. Prerequisite: ACCTG 311. Corequisite: FIN 301. Not open to students with credit in ACCTG 414 or 415.

#### ACCTG 414 Intermediate Financial Accounting I

★3 (*fi 6*) (either term, 3-0-0). First of two courses covering principles, methods and applications of current and proposed Generally Accepted Accounting Principles (GAAP). Emphasizes accounting for operating and investment assets, and related income measurement and disclosure. Prerequisites: ACCTG 311 and 322. Not open to students with credit in ACCTG 412. There is a consolidated exam for ACCTG 414.

#### ACCTG 415 Intermediate Financial Accounting II

★3 (*fi 6*) (either term, 3-0-0). Second of two courses (see ACCTG 414) covering principles, methods and applications of current and proposed Generally Accepted Accounting Principles (GAAP). Emphasizes accounting for financing, liabilities and equity, related income measurement and disclosure, and cash flow. Prerequisites: FIN 301, and a minimum grade of C- in ACCTG 414 or 412.

#### ACCTG 416 Accounting Theory and Current Issues

★3 (*fi 6*) (either term, 3-0-0). Major concepts and current issues in accounting thought are examined in an interactive setting. Topics include: the conceptual framework, standard-setting, concepts of income and value, accounting's role in capital markets and in contracts such as for lending and compensation, and recent and emerging issues related to financial and managerial accounting information. Prerequisites: ACCTG 414 or 412; FIN 301. Open only to fourth-year Business students, or by consent of the Department Chair. There is a consolidated exam for ACCTG 416.

#### ACCTG 418 Advanced Financial Accounting

★3 (*fi 6*) (either term, 3-0-0). The course analyzes the concepts and practices underlying financial reporting in more complex areas such as business combinations, multinational operations, future income taxes and not for profit organizations. Prerequisite: ACCTG 415. Open only to fourth-year Business students or by consent of the Department Chair.

#### ACCTG 424 Intermediate Management Accounting

★3 (*fi 6*) (either term, 3-0-0). Emphasizes mastery of techniques for implementation and evaluation of cost systems for management and decision making. Cost issues include: accumulating and analyzing costs using actual, standard and activity-based approaches, overhead allocation and cost estimation. Management topics include: pricing, production and investment decisions, revenue analysis, performance evaluation, management incentive systems and strategy analysis. Linear programming and multiple regression may be used. Prerequisites: ACCTG 322 and MGTSC 312. There is a consolidated exam for ACCTG 424.

#### ACCTG 426 Management Control Systems

★3 (*fi 6*) (either term, 3-0-0). Current research and cases in managerial accounting and control with a particular focus on strategy, governance and control processes in modern organizations. Topics include: control system design (including governance and audit), responsibility accounting, performance management, and strategic management accounting. Prerequisite: ACCTG 424. Open only to fourth year Business students, or by consent of Department Chair.

#### ACCTG 432 Financial Statement Analysis I

★3 (*fi 6*) (either term, 3-0-0). May be taken on its own or as the first of a two-course sequence that develops student competence in using financial information. Using case analysis, students learn to value a firm through the use of a five-step process: (1) examination of firm's industry, markets and strategy, (2) evaluation of firm's accounting policies and their impact on the financial reports, (3) applying fundamental analysis to assess financial strengths and weaknesses, (4) forecasting future earnings and cash flows, and (5) applying valuation models. Corequisites: ACCTG 415 or 412.

#### ACCTG 433 Financial Statement Analysis II

★3 (*fi 6*) (either term, 3-0-0). Second in a two-course sequence that develops student competence in the application of the tools of financial analysis. Topics include: evaluation of common rule-of-thumb valuation tools such as price to earnings and price to sales ratios in the light of more complete valuation models; analysis for credit and lending decisions; valuing high tech firms; forecasting quarterly and annual earnings; links between stock prices and earnings; using segment information; and other current issues. Prerequisite: ACCTG 432.

#### ACCTG 435 Information, Ethics and Society

★3 (*fi 6*) (either term, 3-0-0). For students in all majors who are interested in information and the roles it plays in business and society. Focus is on the nature and basic characteristics of information, and its importance in contemporary society, viewing information as a commodity that is produced, used, bought and sold. Two aspects of the ways in which information affects people are emphasized: (1) ethical issues relating to professions, businesses, government, and individuals; (2) the impact of information technology and technological change on society. Prerequisites: Open only to third or fourth year Business students, or by consent of the Department Chair. Credit may be granted for only one of ACCTG 435, BUS 435 or MIS 435.

**ACCTG 436 Innovative Assurance Services, Independence and ECommerce**

★3 (fi 6) (either term, 3-0-0). Focuses on a broad array of assurance service topics, including: independence, methods of increasing the effectiveness of auditors, the nature of the accounting industry, e-commerce and security controls, and new assurance services. Prerequisites: ACCTG 311 and MIS 311.

**ACCTG 437 Accounting Information Systems**

★3 (fi 6) (either term, 3-0-0). An introduction to the field of computerized accounting information systems in organizations: basic transaction processing, record updating and maintenance, and financial and managerial reporting functions. Concentrates on the scope of accounting information systems in organizations; impacts of computerized accounting information systems on the role of the professional accountants; design issues for accounting information systems: security, accuracy, integrity, recovery, and operational control issues relating to accounting information systems; and impacts of computerized accounting information systems on the auditing processes in organizations. Prerequisites: ACCTG 311, 322, MIS 311. Credit may be granted for only one of ACCTG 437 or MIS 437.

**ACCTG 442 International Accounting**

★3 (fi 6) (either term, 3-0-0). How international business transactions are reflected in a company's financial statements, and how to manage international operations 'by the numbers.' Managers will develop the tools necessary to understand foreign partners'/competitors' financial statements. Prerequisites: ACCTG 311, 322.

**ACCTG 456 Assurance on Financial Information**

★3 (fi 6) (either term, 3-0-0). Focuses on the external auditor's provision of assurance services on financial information. Topics include: society's demand for various assurance services; the role, profession, ethics, independence and liability of the assurance provider; assurance risk and strategy; assurance planning, operations and reports; computerization and internal control; and emerging assurance services. Prerequisite: ACCTG 414 or 412.

**ACCTG 462 Tax Planning for Managerial Decision Making**

★3 (fi 6) (either term, 3-0-0). For students who are interested in how tax considerations affect business decisions and who want to be able to evaluate tax planning opportunities and strategies. Emphasis is on learning tax planning concepts, not on memorizing detailed tax rules. Provides students with a general framework for understanding the fundamental principles upon which effective tax strategies are based. Applications of this framework include financial and investment decisions, compensation planning, choice of organizational form, mergers and acquisitions, and international tax planning. Prerequisites: ACCTG 311, 322, and FIN 301.

**ACCTG 467 Basic Income Tax**

★3 (fi 6) (either term, 3-0-0). Examines the concepts, regulations and interpretations underlying individual and corporate income tax from the tax professional's perspective. Topics include: structure of the Income Tax Act, residency requirements, employment income, business and property income, capital gains, and the calculation of tax payable for individuals. Tax planning is introduced and opportunities for tax planning are identified where appropriate as topics are covered. Prerequisite: ACCTG 414 or 412.

**ACCTG 468 Corporate Taxation**

★3 (fi 6) (either term, 3-0-0). A study of the major tax concepts behind the specific provisions of the Income Tax Act in the taxation of corporations, corporate distributions and transactions between corporations and their shareholders. Emphasis on applying the Act in practical problems and case settings. Prerequisite: ACCTG 467.

**ACCTG 480 Honors Essay in Accounting**

★3 (fi 6) (second term, 3-0-0). Preparation of the Honors essay required for students in the Accounting Honors Program. Prerequisites: consent of the Department.

**ACCTG 490 Accounting Competition Part I**

★1.5 (fi 3) (either term, 0-1.5s-0). Preparation for Student Competition in Accounting. May be considered as a Group A or Group B elective at the discretion of the Department. Prerequisite: consent of Instructor.

**ACCTG 491 Accounting Competition Part II**

★1.5 (fi 3) (either term, 0-1.5s-0). Completion of Student Competition in Accounting. May be considered as a Group A or Group B elective at the discretion of the Department. Prerequisite: ACCTG 490 and consent of Instructor.

**ACCTG 495 Individual Research Project I**

★3 (fi 6) (either term, 3-0-0). Special Study for advanced undergraduates. May be considered as a Group A or Group B elective at the discretion of the Department. Prerequisites: consent of Instructor and Assistant Dean, Undergraduate Program.

**ACCTG 496 Individual Research Project II**

★3 (fi 6) (either term, 3-0-0). Special Study for advanced undergraduates. Prerequisites: ACCTG 495, consent of the Instructor and Assistant Dean, Undergraduate Program.

**ACCTG 497 Individual Research Project III**

★3 (fi 6) (either term, 3-0-0). Special Study for advanced undergraduates.

Prerequisites: ACCTG 496, consent of the Instructor and Assistant Dean, Undergraduate Program.

**Graduate Courses****ACCTG 501 Introduction to Financial Reporting and Analysis**

★3 (fi 6) (either term, 3-0-0). Accounting information's role in recording and reporting on economic and business events including the primary financial statements: balance sheet, income statement, and cash flow. Concepts and purposes underlying financial reporting. Selection of accounting policies and their informational effects for external users. The course begins to develop students' abilities to evaluate and interpret financial information through basic financial analysis.

**ACCTG 523 Accounting Information and Internal Decision Making**

★3 (fi 6) (either term, 3-0-0). Accounting concepts used by managers in planning and decision-making. The course introduces concepts of cost and profit behavior, contribution margin, and activity-based costing, as well as relevant costs and revenues for production, marketing and capital budgeting decisions. The course also introduces students to the management planning and control system and its components - budgets, variance analysis, performance evaluation in centralized and decentralized organizations, and management compensation plans. The importance of designing a system to fit the organizations' strategy is emphasized. Prerequisite: ACCTG 501.

**ACCTG 586 Selected Topics in Accounting**

★1.5 (fi 3) (either term, 3-0-0). Topics in this seminar may vary from year to year and are chosen at the discretion of the Instructor.

**ACCTG 610 Financial Reporting for Managers and Analysts**

★3 (fi 6) (either term, 3-0-0). Intended for students who would like to build on the financial accounting knowledge developed in ACCTG 501, and is especially useful for those contemplating a career in financial management. Useful both as a stand-alone course and as a foundation for further study in financial statement analysis. Provides further depth in balance sheet valuation and income measurement in order to enhance students' ability to use financial accounting as a management tool. Prerequisite: ACCTG 501. Corequisite: FIN 501. Students may receive credit for only two of the following three courses: ACCTG 610, 614 and 615.

**ACCTG 613 Financial Information and Capital Markets**

★3 (fi 6) (either term, 3-0-0). Uses of financial information by consumers and the incentives that producers face. Prerequisites: ACCTG 501, FIN 501 and MGTSC 501 or 521.

**ACCTG 614 Intermediate Financial Accounting I**

★3 (fi 6) (either term, 3-0-0). First of two courses covering the theory, methods, strengths, and weaknesses of current Generally Accepted Accounting Principles (GAAP). Prerequisite: ACCTG 501. Students may receive credit for only two of ACCTG 610, 614, and 615.

**ACCTG 615 Intermediate Financial Accounting II**

★3 (fi 6) (either term, 3-0-0). Second of two courses covering theory, methods, strengths, and weaknesses of current Generally Accepted Accounting Principles (GAAP). Prerequisite: ACCTG 614. Students may receive credit for only two of the following three courses: ACCTG 610, 614, and 615.

**ACCTG 616 Seminar in Financial Accounting Theory**

★3 (fi 6) (either term, 3-0-0). The theory and propositions underlying current financial accounting practices and alternative theories of accounting measurement as proposed in the literature. The function of accounting in relation to the decision processes of the principal external users of accounting data is considered. Prerequisites: ACCTG 614 or 610, FIN 501.

**ACCTG 618 Seminar in Advanced Accounting Issues**

★3 (fi 6) (either term, 3-0-0). The application of accounting methods to incorporate investments and other advanced topics in financial reporting. Prerequisites: ACCTG 615 or 610 with instructor permission.

**ACCTG 624 Seminar in Management Accounting**

★3 (fi 6) (either term, 3-0-0). Seminar consisting of topics concerned at an advanced level with generating and using accounting and related data in the planning and control functions of organizations. Prerequisite: ACCTG 523.

**ACCTG 626 Seminar in Managerial Control**

★3 (fi 6) (either term, 3-0-0). Current research and cases in managerial accounting. Prerequisites: ACCTG 624 or 523 with instructor permission.

**ACCTG 630 Financial Statement Analysis**

★3 (fi 6) (either term, 3-0-0). Develops students' competence in analyzing financial statements and using financial information to make investment decisions, both equity and debt. The primary thrust of the course is aimed at equity investments. Students learn a five step process of analysis for equity investments: (1) An examination of the firm's industry, markets and strategy, (2) An evaluation of the firm's accounting policies and their impact on the financial reports, (3) Applying fundamental analysis to assess financial strengths and weaknesses, (4) Forecasting future earnings and cash flows, and (5) Applying valuation models to assess the current price. A comparable process for lending decisions is then developed. Prerequisite: ACCTG 501. Corequisite: FIN 501 or 503.



**ACCTG 656 Auditing History, Theory, and Current Thought**

★3 (fi 6) (either term, 3-0-0). Focuses on the external auditor's provision of assurance services on financial information. Topics include: society's demand for various assurance services; the role, profession, ethics, independence and liability of the assurance provider; assurance risk and strategy; assurance planning, operations and reports; computerization and internal control; and emerging assurance services. Prerequisite: ACCTG 614 or 610.

**ACCTG 667 Basic Income Tax**

★3 (fi 6) (either term, 3-0-0). Examines the concepts, regulations and interpretations underlying individual and corporate income tax from the tax professional's perspective. Topics include: structure of the Income Tax Act, residency requirements, employment income, business and property income, capital gains, and the calculation of tax payable for individuals. Tax planning is introduced and opportunities for tax planning are identified where appropriate as topics are covered. Prerequisite: ACCTG 614 or 610.

**ACCTG 686 Selected Topics in Accounting**

★3 (fi 6) (either term, 3-0-0). Topics may vary from year to year and are chosen at the discretion of the instructor.

**ACCTG 701 The Methodological Foundations of Accounting Research**

★3 (fi 6) (either term, 3-0-0). Because the practice of accounting and the use of accounting information are complex and multifaceted, a wide variety of research approaches provide an understanding of accounting. These approaches are primarily in the social sciences, but also in mathematics and some of the humanities, such as history and philosophy. The purpose of this course is to examine some of the fundamental ideas and concepts underlying the research process in accounting. It focuses on the philosophy of the social sciences, since they provide the core of theory and methods for accounting research. Topics include the objectives of social science research; the nature and role of theories; the relationship between facts and values; theory construction, testing, falsification and inference; positivist vs. non-positivist methods; social studies of science and scientists; and research ethics (including research involving human subjects). The emphasis is on the scientific method broadly construed and applied, rather than on specific techniques. Open to all doctoral students or with written permission of the instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

**ACCTG 703 Accounting Research Workshop**

★3 (fi 6) (two term, 3-0-0). Based on the Department's research workshop program, this course will discuss research methodology as it applies to accounting and ensure students learn how to review/evaluate current research and literature. Students are expected to present their own research and to analyze the research of others. This workshop is a single term course offered over two terms. Students are expected to attend regularly throughout their doctoral program, but register for credit in their second year (prior to taking accounting comprehensive examination).

**ACCTG 705 Individual Research**

★3 (fi 6) (either term, 3-0-0).

**ACCTG 706 Behavioral Research in Accounting**

★3 (fi 6) (either term, 3-0-0). A generalist course on research that is primarily oriented to individual behavior in accounting settings. Topics covered will include individual cognitive processes and limitations, the experimental method, and a broad survey of experimental studies (drawing on psychology and economics) conducted in accounting settings. Open to all doctoral students or with the written permission of the instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

**ACCTG 707 Introduction to Accounting in its Organizational and Social Context**

★3 (fi 6) (either term, 3-0-0). A generalist course that examines historical, sociological and organizational perspectives on accounting. Topics covered will vary, but will include the development of accounting thought, historical and field methods in accounting research, theories of accounting change, political economy of accounting, and analysis of the accounting profession and regulatory institutions. Open to all doctoral students or with the written permission of the instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

**ACCTG 708 Introduction to Financial Economics Based Research in Accounting**

★3 (fi 6) (either term, 3-0-0). An introductory course on research that examines the role of accounting information in market economies and organizations. Topics covered will vary, but will include the theory and developments underlying financial economic research and a broad survey of empirical and analytical studies conducted in accounting settings. Open to all doctoral students or with the written permission of the instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

**ACCTG 711 Seminar on Judgement and Decision Making Research in Accounting**

★3 (fi 6) (either term, 3-0-0). Judgement and Decision Making research draws

on theories in psychology, economics, statistics and cognitive science to examine issues in accounting and auditing. Reviews work on a range of issues such as accountability, fraud detection, accounting policy choice, the effect of discretion in accounting rules on decisions made by managers, investors and auditors, and how well auditors can assess the knowledge and/or preferences of other agents. Students may conduct an empirical study (e.g., an experiment, survey, simulation or case study) as part of the course. Some literature in behavioral finance and marketing may also be covered. Pre- or corequisite: MGTSC 705 (or equivalent). Open to all doctoral students or with the written permission of the instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

**ACCTG 721 Advanced Topics in Interdisciplinary Accounting**

★3 (fi 6) (either term, 3-0-0). A specialist course on the conduct of interdisciplinary accounting research. Content will vary depending on the interests of students and faculty, but the emphasis will be on organizational, institutional, social, political or philosophical perspectives on accounting and auditing. Open to all doctoral students or with written permission of the instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

**ACCTG 722 Accounting Epistemology and Research Professionalism**

★3 (fi 6) (either term, 3-0-0). Related to the research workshop series of the Department of Accounting and MIS and providing formal study of alternative accounting research methodologies. Will develop student's skills in presentations, and critically examine the social, political and ethical roles of an academic accountant. Students in the interdisciplinary accounting stream would be expected to attend this course each year they are in the program, but take it only once for credit. Open to all doctoral students or with written permission of the instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

**ACCTG 731 Economic Approaches to Accounting Research**

★3 (fi 6) (either term, 3-0-0). Introduces accounting research topics and methods from the perspective of Financial Economics. Involves significant statistics, economics, and data processing. Focuses on the role of accounting information in market economies. Pre- or corequisite: MGTSC 705 or equivalent. Open to all doctoral students or with written permission of the instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

**ACCTG 732 Analytical Research in Accounting**

★3 (fi 6) (either term, 3-0-0). Develops an information economics framework for understanding the role of accounting information in financial markets and in organizations. Involves significant microeconomics, game theory, and mathematics. Pre- or corequisite: ACCTG 731 or equivalent. Open to all doctoral students or with written permission of the instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

**ACCTG 733 Advanced Topics in Empirical Accounting Research**

★3 (fi 6) (either term, 3-0-0). Intended to serve advanced doctoral students who have a specific interest in financial economics-based accounting research. Covers research design, implementation, and statistical issues in empirical accounting research. Pre- or corequisite: ACCTG 731 or equivalent. Open to all doctoral students or with written permission of the instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

**ACCTG 820 Financial Accounting**

★3 (fi 32) (first term, 3-0-0). Reporting of financial results of operations and financial positions to investors and managers; the use of accounting information for decision making. Restricted to Executive MBA students only.

**ACCTG 830 Organization Planning and Control**

★3 (fi 32) (second term, 3-0-0). Implementing financial performance measurement, evaluation and control systems, and organizational designs that enhance performance; understanding organizational structures and processes. Restricted to Executive MBA students only.

## 231.3 Administration, ADMI

Faculté Saint-Jean

### Cours de 1er cycle

**ADMI 301 Fondements légaux de l'économie canadienne**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude synoptique du système légal canadien, mettant l'accent sur les considérations sous-jacentes de politique sociale. Tout en considérant la nature, les sources, et la philosophie du droit, ainsi que les objectifs des politiques qu'il codifie, des sujets choisis dans les champs de la responsabilité civile délictuelle et contractuelle seront analysés. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour B LAW 301.

**ADMI 302 Introduction à la finance**

★3 (fi 6) (l'un ou l'autre semestre, 3-1s-0). Différents types de titres boursiers et méthodes d'évaluation de base. Évaluation et sélection d'actifs matériels et intellectuels. Fonctionnement et efficacité des marchés financiers. Mesures de

risque et méthode de réduction du risque. Politique de financement, incluant le choix entre l'endettement et les fonds propres. Note: On s'attend à ce que les étudiants soient familiers avec les logiciels informatiques de base. Préalable: STAT 151 ou équivalent. Autres cours préalables ou associés: MGTSC 312, ACCTG 300 ou ACCTG 311.

**O ADMI 311 Introduction à la comptabilité**

★3 (fi 6) (l'un ou l'autre semestre, 3-1.5s-0). Postulats, principes, cycle comptable, calcul du capital et du revenu, préparation et analyse d'un état financier, instance sur les rapports à présenter aux actionnaires et autres agents externes détenant des pouvoirs de décision. Préalable(s): ECONE 101/102. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour ACCTG 311.

**O ADMI 322 Gestion et méthodes de contrôle**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Objectifs d'une entreprise, concepts de planification et de contrôle, accumulation des coûts en vue de l'établissement des prix et de l'évaluation du prix de revient des produits. Préalable(s): ADMI 311 ou ACCTG 311. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour ACCTG 322.

**ADMI 342 Introduction au Commerce International**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction aux outils requis pour réussir dans un monde des affaires de plus en plus international. Sert de tremplin à des cours plus avancés en affaires internationales. Les sujets couverts incluent les différences entre les pays, le commerce international, l'investissement direct étranger, l'intégration économique internationale, le marché des changes, et la stratégie et les opérations en affaires internationales. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour BUEC 342.

**O ADMI 441 Stratégie d'entreprise**

★3 (fi 6) (l'un ou l'autre semestre, 1.5-1.5s-0). Examine les décisions prises par les directions d'entreprises et met l'accent sur le développement de stratégies d'affaires et corporatives. Intègre les principes de gestion étudiés dans le tronc commun en administration des affaires, en utilisant des études de cas. Pourra inclure des invités de l'Université et du monde des affaires. Préalable(s): FIN 301, MARK 301, SMO 201. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour SMO 441.

**O ADMI 444 Commerce international**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Problèmes et opportunités lorsqu'une entreprise opère dans plus d'un pays: le choix à faire entre opérer à l'étranger, l'exportation et l'utilisation de licences; nature et causes de l'émergence des nouveaux marchés de capitaux; institutions internationales facilitant le financement de l'exportation; programmes de stabilisation des prix des produits de base; implications des politiques commerciales, fiscales et d'intégration pour les décisions d'entreprises; aspects de la gestion internationale, incluant la couverture contre le risque de fluctuation des taux de change, coûts de transfert et choix de structure de capital optimale. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour BUEC 444.

**O ADMI 445 Stratégies concurrentielles en commerce international**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Le processus de conception et d'exécution de stratégies compétitives par des firmes opérant dans plusieurs pays ou globalement. Accent sur les cadres de stratégies concurrentielles, les formes changeantes de la compétition internationale, les niveaux d'analyse de la compétition internationale, la formulation et l'exécution de stratégies compétitives internationales. La matière est illustrée par des études de cas spéciaux de firmes canadiennes. Préalable(s): BUEC 311. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour BUEC 445.

**O ADMI 463 L'énergie et l'environnement: Structure industrielle, performance et défis**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Dans ce cours on utilise les outils de l'économie pour obtenir une meilleure compréhension des marchés et de l'industrie de l'énergie. Les différences et similarités entre les industries (pétrole, gaz naturel, électricité, etc.) et entre les différents segments (exploration, production, vente) sont expliquées. On y analyse les grands défis de l'industrie, entre autres la question environnementale et la mondialisation des marchés et les nouvelles formes de la concurrence. On verra comment cette transformation de l'industrie affectera les performances et stratégies de l'industrie. Préalable(s): ECONE 281 ou ECON 281 ou BUEC 311.

**O ADMI 479 L'entreprise et le gouvernement au Canada**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Analyse de l'interaction entre l'entreprise et l'administration publique. On s'intéresse en particulier à la dynamique d'ajustement de la firme et du gouvernement dans les changements d'environnement et de politiques. Les motivations et comportements des décideurs publics et des personnes responsables de l'application des mesures sont présentés dans le contexte d'interaction entre les différents groupes impliqués. Sont posés les bases d'une analyse de l'efficacité des différentes politiques, tant fiscales que réglementaires, visant la firme. On y aborde aussi les conséquences des changements de l'environnement économique, technologique et social pour la firme. Préalable(s): ECONE 281 ou BUEC 311. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour BUEC 479.

## 231.4 Agricultural and Resource Economics, AREC

Department of Rural Economy  
Faculty of Agricultural, Life and Environmental Sciences

### Notes

- (1) Before 2003-2004, Agricultural and Resource Economics courses (AREC) were listed as Agricultural Economics (AG EC).
- (2) See also Environmental and Conservation Sciences (ENCS), Forest Economics (FOREC), Interdisciplinary Undergraduate Courses (INT D) and Rural Sociology (R SOC) listings for related courses.

### Undergraduate Courses

**O AREC 173 The Plate, the Planet and Society**

★3 (fi 6) (second term, 3-0-0). A cornerstone course that provides an introduction to social perspectives on everything from what we eat for breakfast to how we protect endangered species and agricultural landscapes. Topics covered include current issues around food production and consumption and issues related to sustainability of our natural and social systems. Debates over new technologies (e.g., GMOs, nanotechnology), food, environment, and health can only be understood in the context of political, economic and personal decisions. Prerequisites: none. [Rural Economy]

**O AREC 200 Current Economic Issues for Agriculture and Food**

★3 (fi 6) (second term, 3-1s-0). Applications of economic principles to problems and current issues relating to agriculture, food and the environment. Prerequisite: ECON 101 or consent of Department. Credit will only be given for one of AREC 200 and AG EC 200.

**O AREC 214 Applications of Linear Models to Food, Resources and the Environment**

★3 (fi 6) (either term, 3-0-2). An introduction to methods and tools that are used to solve linear quantitative problems. Emphasis is on the use of these techniques for economic analysis in applications related to agriculture, food, forestry, and the environment. Classroom examples, laboratory assignments and computer tutorials are provided to give practice in applying quantitative tools to empirical problems. Prerequisite: Pure Mathematics 30 or Mathematics 30-1. Credit will be granted for only one of AREC 214 and AG EC 316.

**O AREC 313 Statistical Analysis**

★3 (fi 6) (first term, 3-0-2). Analysis of economic data relating to renewable resource sectors including agriculture, food, forestry, and the environment; collection of data, sampling methods, tests of hypotheses, index numbers, analysis of variance, regression, and correlation; time series analysis. Prerequisite: Introductory statistics course. Credit will only be given for one of AREC 313 and AG EC 416.

**O AREC 323 Introduction to Management for Agri-Food, Environmental, and Forestry Businesses**

★3 (fi 6) (either term, 3-0-0). Principles and practical aspects of business management, and their relevance to the managing businesses involved in a variety of industries, including agriculture, environment, food, and forestry. Topics include business planning and organizing, and issues related to the management of financial, physical, and human resources. Prerequisite: ECON 101. Corequisite: ECON 102. Not open to students in BSc Agriculture Business Management, Food Business Management, or Forest Business Management.

**O AREC 333 Economics of Production and Resource Management**

★3 (fi 6) (first term, 3-0-2). Application of economic concepts and introduction of management tools related to production decision-making for resource-based businesses. Integration of biophysical and environmental relationships with economic objectives in allocating resources. Introduction to quantitative tools used in applied production management decision-making. Prerequisite: One of the following: AREC 200, AG EC 200, ECON 281, INT D 365, AREC 365 or equivalent. Credit will only be given for one of AREC 333 and AG EC 333.

**O AREC 365 Natural Resource Economics**

★3 (fi 6) (either term, 3-0-0). Economics of natural resources; resource scarcity, conservation, sustainability, water resource issues, fisheries, forestry, agriculture, recycling, property and tenure institutions and public resource policy. Credit will be given for only one of AREC 365 and INT D 365. Prerequisite: ECON 101.

**O AREC 375 World Food and Agriculture**

★3 (fi 6) (second term, 3-1s-0). Economic issues in international agriculture including the world food problem, agricultural development; agricultural and food trade and policy and selected agricultural biotechnology issues. Selected international applications and issues are stressed. Prerequisite: One of the following: ECON 101 or consent of Department. Credit will only be given for one of INT D 303, AREC 375, AREC 475 and AG EC 475.

**O AREC 384 Food Market Analysis**

★3 (fi 6) (first term, 3-0-1). Applications of price and market theories to marketing problems and issues for food and agricultural products. Topics include: market structures and marketing functions; price analysis; futures markets; economics of food safety and quality; and international food marketing. Prerequisite: One of the

following: AREC 200, AG EC 200, ECON 281, INT D 365, AREC 365 or equivalent. Credit will only be given for one of AREC 384 and AG EC 384.

#### **AREC 400 Special Topics**

★3 (*fi 6*) (either term, 0-3s-0). Individual study of a selected topic or problem supervised by a Faculty member, requiring preparation of written reports. Prerequisite: consent of the Department Chair.

#### **AREC 410 Advanced Methods and Applications in Applied Economics**

★3 (*fi 6*) (second term, 3-0-0). Empirical applications of methods used in resource, environmental, agri-food, and forest economics. Involves one or more case study projects that focus on the empirical examination of economic issues in renewable resource management. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Credit will be given for only one of AREC 410 and ENCS 410. Prerequisite: Open to fourth year students in Agricultural/Food Business Management, Agriculture (Agricultural and Resource Economics major), Environmental and Conservation Sciences (Environmental Economics and Policy major) and Forest Business Management programs, or by consent of Instructor.

#### **AREC 423 Advanced Management Methods and Applications for Agri-Food, Environmental and Forestry Businesses**

★3 (*fi 6*) (second term, 0-3s-0). Empirical applications of management and research methods used by business managers. Emphasis is given to integrating economic and business management concepts with applications to problems and issues in agriculture, food, the environment and forestry. Prerequisite: Open to fourth year students in Agricultural/Food Business Management, Agriculture (Agricultural and Resource Economics major), Environmental and Conservation Sciences (Environmental Economics and Policy major) and Forest Business Management, Nutrition and Food Science (Food marketing minor and Food Policy minor) programs, or by consent of Instructor. Credit will only be given for one of AREC 423 and AG EC 423.

#### **AREC 430 Economic Impact Assessment**

★3 (*fi 6*) (second term, 3-0-0). Examination of the theory and application of economic assessment methods with a focus on the evaluation of environmental, agricultural and natural resource projects, regulatory policy, and planning. Includes case studies of recent project and policy proposals to illustrate the methods used to evaluate economic benefits and costs of such proposals. Applications to estimating private economic benefits. Prerequisite: One of the following: AREC 200, AREC 365, ECON 281, or equivalent, or consent of Instructor. Credit will only be given for one of AREC 430, 450, 530 and 550.

#### **AREC 433 Financial Management in Resource Industries**

★3 (*fi 6*) (first term, 3-0-0). Recent theoretical and empirical developments in finance are applied to natural resource industries including agribusiness, farming, forestry and food. Emphasis on capital budgeting, financial risk, and associated topics for long run investment planning in smaller business enterprises. Prerequisite: One of the following: AREC 200, AG EC 200, ECON 281, INT D 365, AREC 365, FIN 301 or equivalent. Credit will only be given for one of AREC 433 and AG EC 433.

#### **AREC 465 Advanced Natural Resource Economics**

★3 (*fi 6*) (second term, 3-0-0). Applied economic modeling of renewable resource utilization and environmental issues with a focus in forestry and agriculture. Topics may include current Canadian and international issues in the area of environmental valuation, energy, climate change, biodiversity and conservation as related to Forestry and Agriculture. Prerequisite: AREC 365 or permission of Instructor; (AG EC 416 or AREC 313) and ECON 281 recommended. Credit will be given for only one of AREC 465 and INT D 465.

#### **AREC 471 Society and Well-Being**

★3 (*fi 6*) (second term, 3-0-0). Economic, political, historical, and legal perspectives on how and why governments promote well-being in areas such as food safety, nutritional policy, consumer protection, recreation, and the workplace. Topics include the historical development of wellness-related policies, how these decisions are made in society, and economic and moral justifications for such interventions. Prerequisite: One of the following AREC 200, AG EC 200, ECON 281, AREC 365, INT D 365, or consent of instructor.

#### **AREC 473 Food and Agricultural Policies**

★3 (*fi 6*) (either term, 3-0-0). Economics of public policy for agriculture and food industries. Public choice principles and institutions. Farm and food policy in Canada and selected countries. Case studies on price and output policy; agricultural trade; food safety and quality; resource use and environmental sustainability; and/or rural change/restructuring. Prerequisite: One of the following: AREC 200, AG EC 200, ECON 281, INT D 365, AREC 365 or equivalent. Credit will only be given for one of AREC 473 and AG EC 473.

#### **AREC 482 Cooperatives and Alternative Business Institutions**

★3 (*fi 6*) (second term, 3-0-0). The impact of agri-food and resource market structures on market conduct and performance; the impact of market structure on selection of cooperative versus investor owned firms including differences in firm objectives, performance and management incentives; topics may also include effects of firm type on community development and policy formation. Prerequisite: One of the following: AREC 200, AG EC 200, ECON 281, INT D 365, AREC 365 or equivalent. Credit will only be given for one of AREC 482 and AG EC 482.

#### **AREC 484 Strategic Management in Food and Resource Businesses**

★3 (*fi 6*) (either term, 3-0-0). Analysis of strategic management concepts and applications to agri-food and resource industries. The development of business and corporate strategies including competitive positioning; sustaining competitive advantage; vertical coordination and strategic alliances in value chains; corporate diversification and global business strategy. Prerequisite: One of the following: AREC 200, AREC 323, AG EC 200, AG EC 323, ECON 281, INT D 365, AREC 365 or equivalent. Credit will only be given for one of AREC 484 and AG EC 484.

#### **AREC 485 Trade and Globalization in Food and Resources**

★3 (*fi 6*) (first term, 3-0-0). Principles and policies affecting international trade in food, forestry and natural resources. Current issues in trade, including fair trade concerns, trade in capital and services, effects of food safety and quality standards, and environmental issues surrounding trade agreements and institutions. Prerequisite: One of the following: AREC 200, AG EC 200, INT D 365, AREC 365, R SOC 355 or equivalent. Credit will only be given for one of AREC 485 and AG EC 485.

#### **AREC 487 Managing Market Risk in Resource Industries**

★3 (*fi 6*) (either term, 3-0-0). Study of the mechanics and economic functions of commodity futures and options derivative markets. Topics include the theory and practice of hedging, price formation and issues unique to commodities. Emphasis on concepts and analysis to evaluate derivative markets; use of derivatives to manage market risk in agribusiness, forestry and other resource businesses. Prerequisite: One of the following: AREC 200, AREC 365, ECON 281, FIN 301, or equivalent, or consent of instructor.

#### **AREC 488 Introduction to Agricultural and Resource Game Theory**

★3 (*fi 6*) (either term, 3-0-0). Game theory analyzes situations in which payoffs to agents depend on the behavior of other agents. Basics of game theoretic analysis are introduced. Applications to the agri-food and resource industries are discussed. Prerequisites AREC 200, AREC 365, or ECON 281.

## Graduate Courses

### Notes

- (1) See also INT D 565 for a course offered by more than one Department or Faculty and which may be taken as an option or as a course.
- (2) Undergraduate AREC courses at the 400 level may be taken for credit by graduate students in Rural Economy.

#### **AREC 500 Special Topics**

★3 (*fi 6*) (either term, 0-3s-0). Individual study or special topics course in agricultural and resource economics under the supervision of a Faculty member. Prerequisite: consent of Department Chair.

#### **AREC 502 Advanced Price Analysis**

★3 (*fi 6*) (either term, 3-0-0). Principles of consumer demand and producer supply analysis including theoretical and empirical approaches to the analysis of consumer and producer choice. Applications include food demand analysis (single equations and systems approaches), price expectations and producer welfare decisions, market model simulation and policy evaluation, and economic welfare measurement. Corequisite: ECON 481.

#### **AREC 513 Econometric Applications**

★3 (*fi 6*) (either term, 3-0-3). Econometric theory, multiple linear regression analysis and interpretation, simultaneous equation estimation, qualitative choice models, time series analysis, applications of econometric techniques to resource and agricultural economic problems. Prerequisite: Intermediate course in statistics or econometrics. Credit will only be given for one of AREC 513 and AG EC 513.

#### **AREC 514 Quantitative Techniques**

★3 (*fi 6*) (either term, 3-0-3). Selected applications of econometrics, operations research, and mathematical programming to economic problems in resource, agriculture, forestry, and food sectors. Prerequisite: consent of Instructor. Credit will only be given for one of AREC 514 and AG EC 514.

#### **AREC 530 Economic Impact Assessment**

★3 (*fi 6*) (second term, 3-0-0). Examination of the theory and application of economic assessment methods with a focus on the evaluation of environmental, agricultural and natural resource projects, regulatory policy, and planning. Includes case studies of recent project and policy proposals to illustrate the methods used to evaluate economic benefits and costs of such proposals. Applications to estimating private economic benefits. Prerequisite: One of the following: AREC 200, AREC 365, ECON 281, or equivalent, or consent of Instructor. Credit will only be given for one of AREC 430, 450, 530 and 550.

#### **AREC 533 Production Economics**

★3 (*fi 6*) (either term, 3-0-3). Static and dynamic firm theory, production principles applied to resource use, resource and product combination, cost structure, uncertainty and expectations. Prerequisite: consent of Instructor; (AREC 313 or AG EC 416) and ECON 481 recommended. Credit will only be given for one of AREC 533 and AG EC 533.

#### **AREC 534 Agricultural Finance**

★3 (*fi 6*) (either term, 3-0-0). Advanced capital budgeting and financing issues relating to agriculture and small businesses. Risk measurement and management.



Cost of capital and valuation of assets. Development of stochastic simulation and real options models. Prerequisites: consent of Instructor; (AREC 313 or AG EC 416) and (AREC 433, AG EC 433 or FIN 301) recommended.

#### AREC 543 Advanced Topics in Production Economics

★3 (fi 6) (either term, 3-0-0). Theoretical models and empirical methods for issues and problems in production economics. Topics will vary with developments in this field but may include efficiency analysis, risk and uncertainty, simulation and mathematical programming models. Prerequisites: Consent of Instructor. AREC 533 and ECON 481 recommended.

#### O AREC 569 Advanced Topics in Natural Resource and Environmental Economics

★3 (fi 6) (either term, 3-0-0). Theoretical analysis and modeling of renewable resource and environmental issues at local and global levels. Includes analysis of international environmental issues, the effect of economic growth on the environment, sustainable development, and local and global commons management. Prerequisite: ECON 481 or consent of Department. Credit will only be given for one of AREC 569 and AG EC 569.

#### O AREC 573 Agricultural Economics Policy

★3 (fi 6) (either term, 3-0-0). Goals and instruments of agricultural policy, model constructions with decision and control criteria; national, regional, and provincial agricultural application. Prerequisite: consent of Instructor; (AREC 313 or AG EC 416) and (AREC 502 or AG EC 502) recommended. Credit will only be given for one of AREC 573 and AG EC 573.

#### O AREC 575 Agriculture in Developing Countries

★3 (fi 6) (either term, 3-0-0). Role of agriculture in the economic growth of developing countries; influence of international trade and commodity agreements on economic development. Prerequisite: consent of Instructor; (AREC 475 or AG EC 475) and (AREC 502 or AG EC 502) recommended. Credit will only be given for one of AREC 575 and AG EC 575.

#### AREC 582 Industrial Organization in Food and Resource Industries

★3 (fi 6) (either term, 3-0-0). Analysis of firm behavior and market structure in agri-food and resource sectors using industrial organization principles. Introduction to the internal organization of firms with applications to incentives, contracts, and corporate finance. Other topics involve ownership forms such as co-operatives; impacts of market structure on selection of firm structure; and the importance of firm objectives, performance and management incentives. Prerequisite: consent of instructor, ECON 481 recommended.

#### O AREC 584 Marketing Economics

★3 (fi 6) (either term, 3-0-0). Microeconomic theory and analysis of markets for agricultural and food products. Topics will vary with the evolution of the literature but may include alternative market structures, market regulation, empirical price analysis, advertising, location theories, the role of information in markets, the role of uncertainty in markets, and organization structures. Prerequisite: consent of Instructor. (AREC 313 or AG EC 416) and (AREC 502 or AG EC 502) recommended. Credit will only be given for one of AREC 584 and AG EC 584.

#### O AREC 585 Agricultural Trade

★3 (fi 6) (either term, 3-0-0). Concepts and principles underlying international trade and specialization applied to agricultural and food products. Protection and its economic impacts. Agricultural trade policy, institutions and agreements. The role of agricultural trade in developed and less developed countries. Analysis of imperfect markets and alternative approaches to trade liberalization. Prerequisite: consent of Instructor. Credit will only be given for one of AREC 585 and AG EC 585.

#### AREC 600 Directed Studies

★3 (fi 6) (either term, 0-3s-0). Analysis of selected research problems and design of research projects in production economics, natural resource economics, or marketing economics. Prerequisite: consent of Department Chair.

#### AREC 900 Directed Research Project

★3 (fi 6) (variable, unassigned). Credit will only be given for one of AREC 900 and AG EC 900.

## 231.5 Agricultural, Food and Nutritional Science, AFNS

Department of Agricultural, Food and Nutritional Science  
Faculty of Agricultural, Life and Environmental Sciences

**Note:** See also Animal Science (AN SC), Environmental and Conservation Sciences (ENCS), Interdisciplinary (INT D), Nutrition (NUTR), Nutrition and Food Science (NU FS), Plant Science (PL SC), Renewable Resources (REN R) and Soil Science (SOILS) for related courses.

### Undergraduate Courses

#### AFNS 414 Lipid Science

★3 (fi 6) (second term, 3-0-0). Fundamentals in lipid biochemistry featuring learning modules of relevance to students of plant, food and animal science, and

human nutrition, and other life science. Topics include characteristics of lipids, environmental effects on lipid metabolism, oilseed biotechnology and biomass solutions for petrochemical alternatives. Offered in alternate years commencing 2009/10. Graduate students may not register for credit (see AFNS 514). Credit will only be given for one of AFNS 414 and AFNS 514. Prerequisites: (BIOCH 200 or PL SC 331 or PL SC 345) or consent of Instructor.

#### O AFNS 460 Applied Bioinformatics

★3 (fi 6) (second term, 3-0-3). Introduction to databases, software tools, and analysis methods used to characterize DNA and protein sequences. Topics include information retrieval from sequence databases, protein function prediction, assessing sequence similarity, biological pathway analysis, measuring gene expression, proteomics, and protein identification. Prerequisites: STAT 151 and (BIOL 207, BIOCH 200 or PL SC 331.)

### Graduate Courses

**Note:** Prerequisites are shown to provide an indication of the background that is expected for these courses. Students not having the prerequisites for a course are encouraged to discuss their case with the course Instructor.

#### AFNS 500 Individual Study

★3 (fi 6) (either term, variable). Project or reading course under the supervision of a Faculty member requiring preparation of a comprehensive report. Prerequisite: consent of Department. Note: May be taken more than once provided the topic is different.

#### AFNS 501 Advanced Human Metabolism

★3 (fi 6) (either term, 2-1s-0). This is an advanced course that highlights recent developments in human metabolism research. Lectures in fundamentals of human metabolism and nutrition related to each topic will be presented to complement discussion and critical review of readings from primary research and review papers. Application of new findings to understanding of basic metabolic regulation and metabolic diseases will be addressed. Prerequisites: Undergraduate degree in Nutrition, Biochemistry, Physiology or a related discipline and consent of Instructor.

#### AFNS 502 Advanced Study of Food Fermentations

★3 (fi 6) (second term, 3-1s-0). Readings and class presentations on current developments in bacterial or fungal fermentation of foods. Development in Probiotics. Lectures are the same as for NU FS 402, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 502 and NU FS 402. Prerequisite: MICRB 265 or NU FS 361 or 363.

#### AFNS 503 Processing of Milk and Dairy Products

★3 (fi 6) (first term, 3-1s-0). Technological principles of milk treatment and processes for fluid milk products; concentrated, dried, sterilized and fermented dairy products; cheese, butter and ice cream. Lectures are the same as for NU FS 403, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 503 and NU FS 403. Prerequisite: NU FS 374 or consent of Instructor.

#### AFNS 504 Muscle Food Science and Technology

★3 (fi 6) (second term, 3-0-3/2). Biological, biochemical, chemical, and technological aspects of the processing of animal muscle food including seafood product technology. Lectures are the same as for NU FS 404, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 504 and NU FS 404. Prerequisite: ★3 in Biochemistry.

#### AFNS 506 Rangeland Plant Communities of Western Canada

★3 (fi 6) (second term, 3-0-3). Examines major rangeland plant communities and their physical environments in western Canada, including individual plant identification and ecology. Includes a review of various land uses such as livestock and wildlife grazing within these communities, their response to disturbances such as herbivory and fire, and other management considerations. Lectures and labs are the same as for ENCS 406, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 506 and ENCS 406. Prerequisite: ENCS 356 or consent of instructor. [Agricultural, Food and Nutritional Science]

#### AFNS 507 Science and Technology of Cereal and Oilseed Processing

★3 (fi 6) (first term, 3-0-3/2). Biological, biochemical, chemical, and technological aspects of the processing of cereals and oilseeds. Lectures are the same as for NU FS 406, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 507 and NU FS 406. Prerequisite: Consent of Instructor.

#### AFNS 511 Veterinary Immunology

★3 (fi 6) (second term, 3-0-0). Application of immunological principles to the understanding of animal health and disease with a focus on livestock and companion animals. Students will apply a broad understanding of host-pathogen interactions and the basic mechanisms of disease progression to assess the short and long-term impact of pathogenesis to the health of animals, their caretakers, and consumers. Lectures will be followed by active discussion of selected readings. Lectures are the same as for AN SC 411, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of

AFNS 511 and AN SC 411. Prerequisite: (IMIN 200 or equivalent) and consent of instructor.

#### AFNS 514 Lipid Science

★3 (*fi 6*) (second term, 3-0-0). Fundamentals in lipid biochemistry featuring learning modules of relevance to students of plant, food and animal science, and human nutrition, and other life science. Topics include characteristics of lipids, environmental effects on lipid metabolism, oilseed biotechnology and biomass solutions for petrochemical alternatives. Offered in alternate years commencing 2009/10. Lectures are the same as for AFNS 414, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 514 and AFNS 414. Prerequisites: (BIOCH 200 or PL SC 331 or PL SC 345) or consent of Instructor.

#### AFNS 520 Ruminant Physiology and Metabolic Diseases

★3 (*fi 6*) (second term, 3-0-0). A discussion-based course on current literature in digestive physiology, endocrinology, and metabolic diseases of ruminant animals. Offered only in odd numbered years. Prerequisite: ★3 in each of Nutrition and Physiology.

#### AFNS 521 Carcass and Meat Quality

★3 (*fi 6*) (second term, 3-0-3/2). The conversion of muscle to meat: definitions and measurement of carcass and meat quality; influences of pre- and post-slaughter factors on carcass and meat quality. The lab will consist of a two-day field trip during Reading Week. Lectures and labs are the same as for AN SC 420, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 521 and AN SC 420. Prerequisites: ★3 Biochemistry or AN SC 320 and consent of instructor.

#### AFNS 524 Nutrition and Metabolism Related to Cancer

★3 (*fi 6*) (first term, 3-0-0). A lecture and reading course to address nutritional issues specifically related to cancer prevention, diagnosis, treatment and recovery. Lectures are the same as for NU FS 424, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 524 and NU FS 424. Prerequisite: consent of instructor.

#### AFNS 526 Biology, Phytochemistry and Processing of Edible Plants

★3 (*fi 6*) (first term, 3-0-0). Biological, chemical, technological and nutritional aspects of plant-derived foods such as fruits, vegetables, legumes, nuts, spices and herbs, coffee, tea and cocoa. Impact of processing and storage on product quality and safety. Lectures are the same as for NU FS 426, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 526 and NU FS 426. Prerequisite: consent of instructor.

#### AFNS 527 Nutritional Toxicology and Food Safety

★3 (*fi 6*) (first term, 3-0-0). Providing students with an understanding of the principles of risk: benefit evaluations related to the metabolic consequences of exposure to foodborne chemicals and therapeutic agents, and to safety concerns about foods. Lectures are the same as for NU FS 427, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 527 and NU FS 427. Prerequisites: ★3 Biochemistry and ★3 in Microbiology or consent of instructor.

#### AFNS 528 Advances in Functional Foods and Natural Health Products

★3 (*fi 6*) (second term, 0-3s-0). Overview of regulations, chemistry, bioavailability, nutrient interactions, bioactivity mechanisms and potential therapeutic role of non-nutritive components of functional foods and natural health products in the prevention of chronic disease. Seminars are the same as for NU FS 428, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 528 and NU FS 428. Prerequisite: One of NUTR 301, 302 or NU FS 305. ★6 PHYSL recommended.

#### AFNS 532 Advanced Food Protein Chemistry and Technology

★3 (*fi 6*) (first term, 3-0-0). Chemistry and technology of food protein purification, modification, structure and functional properties. Food related proteins from animal and plant sources will be discussed. Offered in alternate years commencing 2009/10. Prerequisite: Consent of instructor.

#### AFNS 543 Diabetes, Cardiovascular Disease and Lifestyle

★3 (*fi 6*) (first term, 3-0-0). This is an advanced course examining the relationship between the role of lifestyle factors in the etiology and pathophysiology, as well as the treatment of type 2 diabetes and cardiovascular disease. Application of recent findings to our understanding of these chronic metabolic diseases will be addressed. Lectures are the same as for NUTR 443, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 543 and NUTR 443. Prerequisite: consent of instructor.

#### AFNS 552 Nutrition in the Prevention of Chronic Human Diseases

★3 (*fi 6*) (second term, 3-0-0). A lecture and reading course for graduate students which will address the scientific basis for nutritional intervention in the prevention of chronic human disease. Lectures are the same as for NUTR 452, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 552 and NUTR 452. Prerequisites: (NUTR 301 or 303) and (302 or 304) or consent of Instructor.

#### AFNS 554 Unit Operations in Food Preservation

★3 (*fi 6*) (second term, 3-0-3). Processes used in food preservation. Dehydration,

refrigeration and freezing, sterilization and canning, irradiation. Effect of processing on food properties. Lectures are the same as for NU FS 454, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 554 and NU FS 454. Prerequisite: NU FS 283, NU FS 361 (or 363) and 372 (or 373) or consent of instructor.

#### AFNS 560 Advanced Feed Science and Technology

★3 (*fi 6*) (first term, 3-0-0). Focus will be given to recent advances in feed quality evaluation and feed processing. Critical evaluation of current literature and oral and written presentation skills of findings will be developed. Offered in alternate years commencing in 2007/08. Prerequisites: One of AN SC 461, 462, 463, 464 or consent of Instructor.

#### AFNS 561 Ruminant Digestion, Metabolism, and Nutrition

★3 (*fi 6*) (second term, 3-0-3). Integration of theory and practical concepts in ruminant nutrition, digestion and metabolism through topics such as energy flow in ruminants, protein systems and net feed efficiency. Laboratories will involve formulation of rations for various physiological states of beef and dairy cattle, economical rations, feed mixes, protein systems (degradable and undegradable protein systems) and net feed efficiency formulations. Lectures and labs are the same as for AN SC 461, with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 561 and AN SC 461. Prerequisite: consent of instructor.

#### AFNS 562 Swine Nutrition

★3 (*fi 6*) (second term, 3-0-3). Nutrient utilization and requirements, feed ingredients, and applied feeding program. Feed formulation strategies and current topics in swine nutrition will be discussed in detail. Lectures and labs are the same as for AN SC 462, with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 562 and AN SC 462. Prerequisite: consent of instructor.

#### AFNS 563 Poultry Nutrition

★3 (*fi 6*) (second term, 3-0-3). Nutritional requirements, feeding programs, and feed ingredients used for poultry. Feed formulation strategies and current topics in poultry nutrition will be discussed extensively. Lectures and labs are the same as for AN SC 463, with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AN SC 463, AFNS 515, and 563. Prerequisite: Consent of Instructor.

#### AFNS 565 Principles of Plant Breeding

★3 (*fi 6*) (first term, 3-0-0). Basic principles of crop improvement by plant breeding. Different plant breeding methods and their relationship to the major crop species. Lectures are the same as for PL SC 465, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 565 and PL SC 465. Prerequisites: BIOL 207 and ★3 statistics.

#### AFNS 566 Advanced Food Microbiology

★3 (*fi 6*) (either term, 3-1s-0). A lecture/discussion course on selected topics in food microbiology. Prerequisite: One of: (MICRB 265, NU FS 361, or 363) and consent of instructor.

#### AFNS 568 Clinical Nutrition

★3 (*fi 6*) (first term, 3-0-3). Basic principles of nutrition in clinical situations. The role of diet in the management of various diseases. The laboratory sessions include practical experience in providing individualized nutritional care for clients from various cultural backgrounds. Lectures and labs are the same as for NUTR 468, with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 568, NUTR 468 and NU FS 468. Pre- or corequisite: NUTR 301.

#### AFNS 569 Advanced Animal Metabolism

★3 (*fi 6*) (first term, 3-0-0). A discussion-based course on selected topics in energy and nitrogen metabolism in domestic animals. Offered in alternate years commencing 2008/09. Prerequisite: 400 level animal nutrition course and consent of instructor.

#### AFNS 570 Experimental Procedures in Nutrition and Metabolism

★3 (*fi 6*) (either term, 0-0-6). Current methodologies in nutrition and metabolism. Prerequisites: NUTR 301 and 302 or equivalent, or consent of Instructor. Credit cannot be obtained for NUTR 504 or AFNS 570.

#### AFNS 571 Applied Poultry Science

★3 (*fi 6*) (first term, 3-0-3). Study of avian anatomy, physiology, behavior, and health as it relates to modern poultry production. Current management practices to optimize production efficiency and animal well-being are examined. Lectures and labs are the same as for AN SC 471, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 571 and AN SC 471. Prerequisite: AN SC 200 or consent of Instructor.

#### AFNS 572 Practical Case Studies in Rangeland Management and Conservation

★3 (*fi 6*) (first term, 3-0-3). Cumulative effects of fire, grazing, browsing, and improvement practices on the productivity and species composition of range and pasture ecosystems, including management implications. Extended field trip prior to the start of classes. Lectures and labs are the same as for ENCS 471, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 572 and ENCS 471. Offered in

alternate years commencing 2001-02. Prerequisite: ENCS 356; ENCS 406 strongly recommended.

#### **AFNS 574 Applied Beef Cattle Science**

★3 (fi 6) (first term, 3-0-3). Examination of current and potential future production and management practices to optimize production efficiency and animal well being in the Canadian and international beef industry. Laboratories emphasize practical applications, field trips, and discussion. Lectures and labs are the same as for AN SC 474, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 574 and AN SC 474. Prerequisite: AN SC 200 or consent of Instructor.

#### **AFNS 575 Advanced Functional Genomics Technologies in Agricultural, Food and Nutritional Science**

★3 (fi 6) (either term, 0-0-6). Modular course offering training in a variety of research technologies. Modules offered will vary from term to term. Modules may include HPLC, gel electrophoresis, real-time PCR, gene isolation and cloning, gene amplification, cDNA library screening and microarray. Prerequisite: Consent of Instructor.

#### **AFNS 576 Applied Swine Science**

★3 (fi 6) (second term, 3-0-3). Evaluation of swine breeding, feeding, housing management, and disease prevention practices that optimize production efficiency and animal well-being. Laboratories involve analysis of production practices with a view to optimizing efficiency. Lectures and labs are the same as for AN SC 476, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 576 and AN SC 476. Prerequisite: AN SC 200 or consent of Instructor.

#### **AFNS 577 Advanced Community Nutrition**

★3 (fi 6) (first term, 3-0-3). Examination of nutrition problems in contemporary communities that relate to health promotion, food security, policy, program planning and community nutrition throughout the life cycle. Discussion of nutrition programs and resources. Students will develop the skills to write a community grant application. Lectures and labs are the same as for NUTR 477, with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 577 and NUTR 477. Prerequisite: consent of instructor.

#### **AFNS 578 Advanced Clinical Nutrition**

★3 (fi 6) (second term, 3-0-3). The principles of diet therapy in selected areas of current interest. Emphasis on case studies, research and practical problems in clinical dietetics. Lectures and labs are the same as for NUTR 476, with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 578, NUTR 476, and NU FS 476. Prerequisite: NU FS 468 or NUTR 468. Pre- or corequisite: NUTR 302.

#### **AFNS 579 Advanced Nutrition: Vitamins and Inorganic Elements**

★3 (fi 6) (first term, 3-0-0). A lecture and reading course in vitamins and inorganic elements. Introduction to seminar presentation and critical evaluation of current literature. Students will also learn the skill of writing a scientific paper. Lectures are the same as for NUTR 479, with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 579, NUTR 479, and NU FS 479. Prerequisite: NUTR 302. NUTR 301 (or 303) recommended.

#### **AFNS 580 Advanced Study of Foodborne Pathogens**

★3 (fi 6) (second term, 3-1s-0). Emerging issues in microbiological safety of foods. Reading and class presentations on current developments in the microbiological safety of foods. Lectures are the same as for NU FS 480, with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 580 and NU FS 480. Prerequisite: MICRB 265 or NU FS 361 or 363.

#### **AFNS 581 Advanced Foods**

★3 (fi 6) (second term, 3-0-0). Critical evaluation of current literature on the effects of ingredients and processing on quality characteristics of foods. Lectures are the same as for NU FS 481, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 581 and NU FS 481. Prerequisites: NU FS 374 and ★3 Biochemistry or consent of instructor.

#### **AFNS 582 Diseases of Field and Horticultural Crops**

★3 (fi 6) (second term, 0-3s-0). Diseases of cereal, oilseed, pulse, forage, vegetable, fruit, and ornamental crops. Course is the same as PL SC 481, but with additional assignments and evaluation appropriate to graduate studies. Offered in alternate years commencing in 2002-03. Credit will only be given for one of AFNS 582 and PL SC 481. Prerequisite: PL SC 380 or consent of instructor.

#### **AFNS 585 Advanced Quantitative Genomics**

★3 (fi 6) (second term, 3-0-3). Genetics and analysis of quantitative traits in farm animals and plants. Detecting, locating and measuring effects of quantitative trait loci (QTL). Recent developments in QTL mapping and discovery. The laboratory sessions include commonly used software for analyzing data from breeding and genomics experiments. Offered in alternate years commencing in 2007/08. Prerequisite: Consent of Instructor.

#### **AFNS 595 Integrated Crop Protection**

★3 (fi 6) (second term, 0-3s-0). Integrated agronomic, mechanical, and chemical control of insects, disease organisms, and weeds that interfere with field crop and horticultural crop production. Lectures are the same as for PL SC 495,

but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 595 and PL SC 495. Prerequisites: At least two of ENT 207, PL SC 352 or PL SC 380 as prerequisites and the third as a corequisite.

#### **AFNS 599 Advanced Agri-Chemical Analysis**

★3 (fi 6) (second term, 3-0-3). Advanced analysis of food and agri-industrial materials with a focus on good laboratory practices (GLP), chromatographic techniques (HPLC, GC), mass spectrometry, and other modern techniques from sample preparation to analysis of data. Lectures are the same as for NU FS 499, but with additional assignments and evaluation appropriate to graduate studies. Credit will only be given for one of AFNS 599 and NU FS 499. Prerequisite: NU FS 372 or consent of Instructor.

#### **AFNS 601 Seminar**

★1 (fi 2) (either term, 0-2s-0). Covers specialized topics of current interest to graduate students in AFNS. Presentations by students, faculty and invited speakers. Students register in one of four sections - Animal Science, Plant Science, Food Science or Human Nutrition. Attendance is required of all graduate students throughout their program. MSc students normally register for one term in year 2, and are required to present one seminar; PhD students normally register for one term in each of year 1 and 3, and are required to present one seminar per term. Only open to graduate students in AFNS.

#### **AFNS 602 Graduate Reading Project**

★3 (fi 6) (either term, variable). Individual study. Critical reviews of selected literature under the direction of a Faculty member. Note: May be taken more than once if the topic is different. Prerequisite: consent of Department.

#### **AFNS 603 Graduate Research Project**

★3 (fi 6) (either term, variable). Directed laboratory study under supervision of a Faculty member. Note: May be taken more than once if the topic is different. Prerequisite: consent of Department.

#### **AFNS 660 Communication in Science**

★3 (fi 6) (first term, 0-3s-0). Course designed for graduate students in the early stages of their graduate program. Students will learn effective communication skills for life as a graduate student and a future scientist. Topics will include the scientific method; paper, thesis and grant writing; poster and lecture development and delivery; ethics in science; graduate student supervisor relationships. Open only to graduate students in the Department of Agricultural, Food and Nutritional Science. Preference given to those in the first year of their program. Prerequisite: Consent of Instructor.

#### **AFNS 670 Current Topics in Nutrition and Metabolism**

★3 (fi 6) (either term, 0-3s-0). Selected topics in digestive physiology, fat/carbohydrate/protein metabolism, vitamins/minerals, dietary modulation of function or ruminant nutrition. May be taken for credit more than once.

#### **AFNS 680 Doctoral Seminar**

★3 (fi 6) (second term, 0-3s-0). Discussion and presentations based on current topics to provide PhD candidates with experience and understanding in advanced nutrition. Students also learn about research funding and how to develop a major grant application. Credit cannot be obtained for NU FS 680 and AFNS 680.

#### **AFNS 900 Directed Research Project (Course-based Masters)**

★3 (fi 6) (either term, unassigned). Individual study supervised by the student's supervisor, requiring the preparation of a comprehensive report, presentation of a seminar and oral examination by the student's supervisor and one additional faculty member. Open only to students in the MAg, MEng or MSc course-based program.

## 231.6 Agriculture, Life and Environmental Sciences, ALES

Faculty of Agricultural, Life and Environmental Sciences

### Undergraduate Courses

#### **ALES 204 Communication Theory and Practice**

★3 (fi 6) (either term, 3-0-2). Principles of professional communication, including written, oral, and electronic components. Prerequisite: A minimum of ★24 university credits. Open only to Faculty of Agricultural, Life and Environmental Sciences students. Credit will be given for only one of ALES 204, AFHE 204, AFHE 304 and AGFOR 204.

## 231.7 American Sign Language, ASL

Department of Modern Languages and Cultural Studies  
Faculty of Arts

#### **Notes**

(1) The Department reserves the right to place students in the language course appropriate to their level of language skill.



- (2) Placement tests may be administered in order to assess prior background. Students with an American Sign Language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in an advanced course more suitable to their level of ability. Students seeking to fulfill their Language Other than English requirement may begin at any one appropriate level, but must take the full ★6 in one language.
- (3) The Department will withhold credit from students completing courses for which prior background is deemed to make them ineligible. For example, 100-level courses are normally restricted to students with little or no prior knowledge in that language. Should a student with matriculation standing, or those possessing prior background (such as native speakers or those for whom it is their first language) register in the 100-level course, credit may be withheld.

## Undergraduate Courses

### ASL 111 Beginners' American Sign Language I

★3 (fi 6) (either term, 5-0-0). Designed to provide basic practical communication and conversational skill in American Sign Language for students with little or no previous background. Covers material in matriculation-level ASL. Note: Not to be taken by students with native or near native proficiency, or students with credit in ASL 35 or its equivalents in Canada or other countries. Not to be taken by students with credit in EDPY 474 or 565.

### ASL 112 Beginners' American Sign Language II

★3 (fi 6) (either term, 5-0-0). Prerequisite: ASL 111 or consent of Department. Note: Not to be taken by students with native or near native proficiency, or students with credit in ASL 35 or its equivalents in Canada or other countries.

### ASL 211 Intermediate American Sign Language I

★3 (fi 6) (either term, 5-0-0). Intensive instruction in ASL Topics covered on deaf community and culture. Prerequisite: ASL 35 or ASL 112 or consent of Department.

### ASL 212 Intermediate American Sign Language II

★3 (fi 6) (either term, 5-0-0). Prerequisite: ASL 211 or consent of Department.

## 231.8 Anatomie, ANATE

Faculté Saint-Jean

### Cours de 1er cycle

#### ANATE 140 Anatomie

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction aux structures du corps humain. Doit être complété avant l'année 2 du BSclnf (bilingue). Notes: La priorité sera accordée aux étudiants du BSclnf (bilingue). Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour NURS 140.

#### ANATE 409 Histologie Humaine

★3 (fi 6) (l'un ou l'autre semestre, 3-0-3). Ce cours d'introduction à l'histologie mettra l'accent sur la reconnaissance et l'identification de la structure et de l'organisation cellulaire associée à la physiologie normale des divers tissus et organes du corps humain. Ce cours comportera une part égale de cours théoriques et de laboratoires étant donné qu'il est essentiel d'acquérir et développer le sens de l'observation nécessaire à l'étude de l'histologie. Ce cours devrait permettre une compréhension de la relation étroite entre l'histologie, la physiologie et la pratique médicale. Préalables: BIOLE 201, PHYSE 210, ou PHYSL 210, ou PHYSL 212 et 214, ou ZOOL 241 et 242.

## 231.9 Anatomy, ANAT

Division of Anatomy  
Faculty of Medicine and Dentistry

### Undergraduate Courses

#### ANAT 200 Human Morphology

★3 (fi 6) (either term, 3-0-0). An introductory survey course in general human anatomy. The course covers the gross and microscopic anatomy of the tissues, organs and organ systems of the body, with emphasis on the relationships, interactions and functions of major structures.

#### ANAT 400 Human Embryonic Development

★3 (fi 6) (first term, 3-0-0). A study of the development of the human embryo from conception to birth. The development of cells, tissues and organs of specific major structures will be covered including their relative development to other systems and structures. An understanding of anomalous development and the ability to survive will be included based on a thorough understanding of normal development. Prerequisite: ANAT 200 or consent of Division. Note: Credit will be granted for only one of ANAT 300 or 400.

#### ANAT 401 Human Neuroanatomy

★3 (fi 6) (second term, 3-0-0). A study of the human nervous system including

its development and function from an anatomical viewpoint. Both the central and peripheral nervous systems will be presented with some emphasis on abnormal development and its consequences. There will be an emphasis on clinical application where appropriate. Prerequisite: ANAT 200 or consent of Division. Note: Credit will be granted for only one of ANAT 301 or 401.

#### ANAT 402 Human Histology

★3 (fi 6) (second term, 0-3s-0). A detailed study of the histology of the tissues and organ systems of the human body and the structural principles that govern their organization, interaction and physiological function. Will be based on self-study, utilizing an interactive, web-based learning program, and group discussions during weekly seminar sessions. Prerequisite: ANAT 200 or equivalent and consent of Division.

#### ANAT 403 The Human Body

★6 (fi 12) (first term, 3-0-5). A detailed, regional study of the gross anatomy of the human body using functional, clinical, and evolutionary perspectives. Will include lectures and laboratory sessions involving dissection of human cadavers. Prerequisite: ANAT 200 or equivalent and consent of Division.

#### ANAT 490 Individual Study

★3 (fi 6) (either term, 0-0-6). Registration is contingent upon a student having made prior arrangements with a Faculty member in the Division. Credit may be obtained for this course more than once. This is primarily a supervised self-study in any of the anatomical disciplines. Prerequisite: consent of Division.

#### ANAT 491 Current Topics in Anatomy

★3 (fi 6) (either term, 0-1s-0). Discussion of topics relevant to the anatomical disciplines. Credit may be obtained for this course more than once. Prerequisite: consent of Division.

#### ANAT 497 Research Project

★4-8 (variable) (variable, variable). Directed research carried out in the laboratory of an assigned member of the Division. Credit for this course may be obtained more than once. Successful completion requires a written report and oral presentation on the research project. Registration is contingent upon a student having made prior arrangements with a Faculty member in the Division. Prerequisite: consent of Division.

## Graduate Courses

#### ANAT 600 Medical Gross Anatomy

★8 (fi 16) (two term, 0-0-12). Advanced study of human gross anatomy. Will entail supervised, self-directed, hands-on dissection by the student for the examination of human structure and function. Particular emphasis will be placed on the clinical relevance of Human Anatomy and its importance to clinical medicine. Prerequisite: consent of Division.

#### ANAT 601 Medical Neuroanatomy

★4 (fi 8) (second term, 3-0-3). Advanced study of the human nervous system. Lectures will be accompanied by hands-on dissection of human tissue. Emphasis will be placed on the clinical relevance of central and peripheral nervous system structure and their involvement with motor and sensory processing systems. Prerequisite: consent of Division.

#### ANAT 603 Medical Histology

★3 (fi 6) (second term, 0-3s-1). Advanced study of human histology with an emphasis on the relevance of histological examination to clinical medicine. Students will participate in discussions and complete a web-based interactive program. Prerequisite: consent of Division.

#### ANAT 604 Medical Embryology

★3 (fi 6) (first term, 3-0-1). Advanced study of human development from conception to birth with particular reference to clinical issues in humans. Lectures will be supplemented with practical examination of specimens. Prerequisite: consent of Division.

#### ANAT 606 Selected Topics in Advanced Human Anatomy

★3 (fi 6) (either term, 0-0-3). An in-depth, supervised, self-directed study focussing on topics relevant to the anatomical disciplines. Credit may be obtained for this course more than once. Registration is contingent upon a student having made prior arrangements with a Faculty member in the Division. Prerequisite: consent of Division.

#### ANAT 607 Current Topics in Human Anatomy

★3 (fi 6) (either term, 0-1s-0). Discussion of topics relevant to the anatomical disciplines. Credit may be obtained for this course more than once. Prerequisite: consent of Division.

## 231.10 Andragogie, ANDR

Faculté Saint-Jean

### Cours de 2e cycle

#### ANDR 520 Formation expérientielle à la dynamique de groupe

★3 (fi 6) (l'un ou l'autre semestre, 1-2s-0). Les concepts de groupe, d'organisation



et d'institution. La dynamique de groupe: définition, ses différentes étapes, son utilisation dans le groupe de tâche et d'apprentissage. Préalable(s): ANDR 510 ou l'approbation du Vice-doyen aux affaires académiques.

## 231.11 Anglais, ANGL

Faculté Saint-Jean

### Notes

- (1) Only one ★6 or two ★3 courses at the 100 level can be credited to the BA program.
- (2) Prerequisite for 200, 300, and 400 level courses is ★6 of junior level English/Anglais.
- (3) ★6 of junior level English/Anglais can include ANGL 111 (★6) or ANGL 113 (★6), or ANGL 122 (★3) and ANGL 126 (★3).
- (4) ANGL 102 was previously the final course in the series of Anglais langue seconde courses (ALS). It does not qualify for credit toward the required ★6 of junior level English/Anglais. (see §183.5.2 and notes §231.13).
- (5) ANGL 102 is now called ALS 125. The course remains the same.

### Undergraduate Courses

#### ANGL 111 Language, Literature and Culture

★6 (*fi 12*) (two term, 3-0-0). Studies in the literary and cultural uses of language. Not to be taken by students with ★6 in approved junior English/Anglais including ANGL 101. Prerequisite: English Language Arts 30-1 or ANGL 102 or ALS 125 or equivalent.

#### ANGL 113 English Literature in Global Perspective

★6 (*fi 12*) (two term, 3-0-0). Studies in the literatures of the English-speaking world. Not to be taken by students with ★6 in approved junior English/Anglais including ANGL 101. Prerequisite: English Language Arts 30-1 or ANGL 102 or ALS 125 or equivalent.

#### ANGL 122 Texts and Contexts

★3 (*fi 6*) (either term, 3-0-0). This course explores a specific issue using a variety of genres and media. Not to be taken by students with ★6 in approved junior English/Anglais including ANGL 101, 111, 113. Prerequisite: English Language Arts 30-1 or ANGL 102 or ALS 125 or equivalent.

#### ANGL 126 Exploring Writing Studies

★3 (*fi 6*) (either term, 0-3s-0). This workshop course focuses on both the theory and practice of the writing process to help students experience firsthand how university writers enter into rich ongoing conversations by engaging with the words and ideas of others. Prerequisite: English Language Arts 30-1 or ANGL 102 or ALS 125 or equivalent. Note: Not to be taken by students with credits in WRS 101.

#### ANGL 328 Canadian Women's Narrative

★3 (*fi 6*) (either term, 3-0-0). Study of selected works of different genres by Canadian women writers and filmmakers in English or in French. Content and period focus may vary. Prerequisite: ★6 in junior Anglais/English, French Language and Literature, and/or Comparative Literature, and knowledge of French and English.

#### ANGL 429 Canadian Cultural Narratives

★3 (*fi 6*) (either term, 3-0-0). Study of selection of Canadian literary, cinematic, and mediatic narratives from French and English Canada, considering the perspective of their relationship to one another both within the Canadian multicultural context and that of world politics. Prerequisite: ★6 in junior Anglais/English, French Language and Literature, and/or Comparative Literature, and knowledge of French and English.

## 231.12 Anglais langue seconde, ALS

Faculté Saint-Jean

### Notes

- (1) La série de cours d'Anglais langue seconde sont: ALS 105, 110, 115, 120 et ALS 125.
- (2) Les cours ALS 105, 110, 115, et ALS 125 se destinent aux étudiants qui ne disposent pas de la base nécessaire pour satisfaire aux exigences des cours ANGL 111, 113, 122 et ANGL 126.
- (3) Affectation par test de placement obligatoire (voir §183.5.2) pour tous les cours ALS 105, 110, 115, 120 et ALS 125.

### Cours de 1er cycle

#### ALS 105 Niveau élémentaire 1

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-2). Étude des éléments et des structures de base de l'anglais parlé et écrit. Note : Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour ANGL 113, ESL 140, 145, 150, ALS 100, 160, 110, 115, 120, ANGL 102, ALS 125 ou leurs équivalents. Affectation par

test de placement obligatoire. Veuillez consulter l'article « Test obligatoire pour les étudiants ne présentant pas English 30 ou l'équivalent » dans la section de Faculté Saint-Jean de l'annuaire.

#### ALS 110 Niveau élémentaire 2

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-2). Étude des éléments et des structures de base de l'anglais parlé et écrit. Note : Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour ANGL 113, ESL 140, 145, 150, ALS 100, 160, 115, 120, ANGL 102, ALS 125 ou leurs équivalents. Affectation par test de placement obligatoire ou préalable ALS 105. Veuillez consulter l'article « Test obligatoire pour les étudiants ne présentant pas English 30 ou l'équivalent » dans la section de Faculté Saint-Jean de l'annuaire.

#### ALS 115 Niveau intermédiaire 1

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-2). Étude des éléments et des structures complexes de l'anglais parlé et écrit. Note : Anciennement ANGL 113 et ALS 160. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour ANGL 113, ESL 140, 145, 150, ALS 160, 120, ANGL 102, ALS 125 ou leurs équivalents. Affectation par test de placement obligatoire ou préalable ALS 110. Veuillez consulter l'article « Test obligatoire pour les étudiants ne présentant pas English 30 ou l'équivalent » dans la section de Faculté Saint-Jean de l'annuaire.

#### ALS 120 Niveau intermédiaire 2

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-2). Étude des éléments et des structures complexes de l'anglais parlé et écrit. Note : Anciennement ANGL 113 et ALS 160. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour ESL 140, ESL 145, ESL 150, ALS 160, ALS 125, ANGL 102, ALS 125 ou leurs équivalents. Affectation par test de placement obligatoire ou préalable ALS 115. Veuillez consulter l'article « Test obligatoire pour les étudiants ne présentant pas English 30 ou l'équivalent » dans la section de Faculté Saint-Jean de l'annuaire.

#### ALS 125 Introduction à l'anglais écrit, niveau universitaire

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-2). Vise à faire acquérir les compétences communicatives écrites nécessaires à l'expression courante de niveau universitaire. Note: Anciennement ANGL 102. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour ESL 140, ESL 145, ESL 150, ALS 160, ANGL 102 ou leurs équivalents. Affectation par test de placement obligatoire ou préalable ALS 120. Veuillez consulter l'article « Test obligatoire pour les étudiants ne présentant pas English 30 ou l'équivalent » dans la section de Faculté Saint-Jean de l'annuaire.

#### ALS 130 Pratique avancée de l'expression et de la compréhension orales

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-2). Vise à faire acquérir les compétences communicatives en anglais nécessaires à l'expression orale de niveau universitaire. Affectation par test de placement obligatoire ou préalable ALS 125.

## 231.13 Animal Science, AN SC

Department of Agricultural, Food and Nutritional Science  
Faculty of Agricultural, Life and Environmental Sciences

**Note:** See also Agricultural, Food and Nutritional Science (AFNS), Environmental and Conservation Sciences (ENCS), Interdisciplinary (INT D), Nutrition (NUTR), Nutrition and Food Science (NU FS), Plant Science (PL SC), and Renewable Resources (REN R) for related courses.

### Undergraduate Courses

#### AN SC 100 Introduction to Animal Health Science

★3 (*fi 6*) (either term, 3-0-3). An orientation to current issues and challenges related to animal health and disease in a global context. An interdisciplinary overview of the role and importance of animal health in modern society and its relationship to agriculture, food safety and human health. Causes of disease and the principles of maintaining healthy animals. The history and development of animal health professions and their roles. Not available to students who have credit in AN SC 375. Not available to students with ★90 in ALES or Science without consent of instructor. Prerequisite: Biology 30.

#### AN SC 110 Introduction to Equine Science

★3 (*fi 6*) (first term, 3-0-0). Introduction to horses and the horse industry. Principles of equine anatomy, physiology, nutrition, ecology, behavior, genetics, health and welfare. Not available to students with ★90 in Agricultural, Life and Environmental Sciences or Science without consent of instructor.

#### AN SC 120 Companion Animals and Society

★3 (*fi 6*) (either term, 3-0-3). Diverse and evolving roles of companion animals in human society. Pets and the companion animal industry. Topics include: behavior, cognition and training; breeds and breeding; performance; nutrition, health and physiology. Not available to students with ★90 in Agricultural, Life and Environmental Sciences or Science without consent of Instructor.

#### AN SC 200 Principles of Animal Agriculture

★3 (*fi 6*) (either term, 3-0-3). Principles and practices of modern animal production

and management. Brief introduction to the structure of the livestock, poultry, and game ranching industries. Principles of animal management, breeding and feeding. Current issues in animal agriculture. Students gain direct experience with animals in production/research environments. Prerequisite: Biology 30.

**O AN SC 260 Fundamentals of Animal Nutrition**

★3 (fi 6) (first term, 3-0-3). Function, metabolism, homeostasis, requirements and sources of nutrients and energy for animals. Laboratory will involve principles of diet formulation. Prerequisite: ★3 in university-level biology or chemistry. Credit will be given for only one of AN SC 260, NUTR 260 and NUTR 301 or equivalent.

**L AN SC 310 Physiology of Domestic Animals**

★3 (fi 6) (first term, 3-0-3). Fundamental principles of regulation and maintenance of the internal environment. Includes a review of mechanisms providing for homeostasis and well-being of domestic animals in response to changes in the external environment (e.g., light, temperature, social). Prerequisites: BIOL 107 and ★6 in university-level chemistry.

**L AN SC 311 Metabolic Physiology of Domestic Animals**

★3 (fi 6) (second term, 3-0-3). The physiological basis of the metabolic processes in domestic animals. Includes a review of the physiological mechanisms and neuroendocrine regulation of digestion, metabolism, growth and lactation. Prerequisite: AN SC 310 or equivalent.

**L AN SC 312 Reproductive Physiology of Domestic Animals**

★3 (fi 6) (second term, 3-0-3). The physiological basis of reproduction, fertility and embryonic development in domestic animals in relation to animal productivity. The study of the physiological mechanisms regulating gonadal function, fertilization, implantation, pregnancy and parturition as well as the physiological basis for sound reproductive management. Prerequisite: AN SC 310 or equivalent.

**O AN SC 318 Influence of Microorganisms on Animal Biology**

★3 (fi 6) (second term, 3-0-0). Fundamentals of interactions between microorganisms and animals and how these interactions integrate with animal production and improvement of animal health. Emphasis on the evolution and ecology of the microbial inhabitants with the host and the underlying molecular mechanisms of the host microbial interactions. Pre- or corequisite: MICRB 265 or BIOL 207.

**O AN SC 320 Livestock Growth and Meat Production**

★3 (fi 6) (first term, 3-2s-0). Concepts of growth and development applied to meat production from farm livestock. Form and function of bone, muscle and fat. Livestock and carcass appraisal. Prerequisite: AN SC 200 or ★3 in university level biology.

**O AN SC 322 Poultry Product Technology**

★3 (fi 6) (first term, 3-0-3). Understanding product concepts, consumer trends, value-added processing technology, marketing strategy and research and development in the poultry industry. Prerequisites: ★3 in university-level biology and ★6 in university-level chemistry.

**O AN SC 375 Animal Health and Disease**

★3 (fi 6) (second term, 3-0-0). Principles of maintaining healthy animals, and an examination of current issues related to animal health and disease. Infectious and non-infectious diseases that affect both animal and human health and may impact international trade and export. Disease surveillance, pathophysiology, treatment, prevention, management and economic impact of specific diseases and risks of bioterrorism. Prerequisite: AN SC 100 and 200 or consent of instructor. AN SC 310 or PHYSL 210 or (ZOOL 241 and 242) are recommended.

**O AN SC 376 Animal Welfare**

★3 (fi 6) (first term, 3-0-0). An overview of animal welfare as it relates to both food and companion animals. Discussion of the scientific and ethical components that underlie our evaluation of the quality of life that animals experience. Prerequisite: AN SC 200 or (★3 biology and consent of instructor).

**O AN SC 377 Food Animal Behaviour**

★3 (fi 6) (second term, 3-0-0). Basic behaviour principles for food animal species including their application in livestock production systems. Fundamentals of experimental research and design in applied ethology. Prerequisite: AN SC 200 or consent of instructor.

**O AN SC 378 Companion Animal Behaviour**

★3 (fi 6) (first term, 3-0-0). Basic behaviour principles for companion animal species such as dogs, cats, and horses, including application of fundamental training and learning techniques to resolve common behaviour problems. Prerequisite: AN SC 120 or consent of instructor.

**O AN SC 391 Metabolism**

★3 (fi 6) (second term, 3-0-0). Emphasis on metabolism of carbohydrates, proteins, amino acids, nucleic acids and lipids. Prerequisite: PL SC 331 or ★3 in Biochemistry.

**O AN SC 400 Individual Study**

★3 (fi 6) (either term, variable). Project or reading course supervised by a Faculty member, requiring preparation of a comprehensive report. Prerequisites: Third year standing or higher and consent of Department. Note: May be taken more than once if topic is different.

**O AN SC 410 Regulation of Reproduction in Domestic Animals**

★3 (fi 6) (first term, 3-1s-0). Study of basic physiological mechanisms involved in the control of reproduction in domesticated animals as a basis for developing practical approaches for the regulation of reproductive processes. Prerequisite: AN SC 312 or consent of Instructor.

**O AN SC 411 Veterinary Immunology**

★3 (fi 6) (second term, 3-0-0). Application of immunological principles to the understanding of animal health and disease with a focus on livestock and companion animals. Students will apply a broad understanding of host-pathogen interactions and the basic mechanisms of disease progression to assess the short and long-term impact of pathogenesis to the health of animals, their caretakers, and consumers. Lectures will be followed by active discussion of selected readings. Graduate students may not register for credit (see AFNS 511). Credit will only be given for one of AFNS 511 and AN SC 411. Prerequisite: (IMIN 200 or equivalent) and consent of instructor.

**O AN SC 412 Equine Nutrition and Reproduction**

★3 (fi 6) (second term, 3-0-3/2). Principles of digestive, exercise, environmental, and reproductive physiology of horses. Lectures will cover nutrient requirements of the horse, sources of energy and nutrients, feed formulation and practical feeding management. Laboratories will emphasize practical aspects of horse feeding, reproduction, and management and will involve field trips. Prerequisites: (AN SC 260 or ★3 animal nutrition) and (AN SC 312 or equivalent).

**O AN SC 420 Carcass and Meat Quality**

★3 (fi 6) (second term, 3-0-3/2). The conversion of muscle to meat: definitions and measurement of carcass and meat quality; influences of pre- and post-slaughter factors on carcass and meat quality. The lab will consist of a two-day field trip during Reading Week. Graduate students may not register for credit (see AFNS 521). Credit will only be given for one of AFNS 521 and AN SC 420. Prerequisite: ★3 Biochemistry or AN SC 320, or consent of instructor.

**O AN SC 461 Ruminant Digestion, Metabolism, and Nutrition**

★3 (fi 6) (second term, 3-0-3). Integration of theory and practical concepts in ruminant nutrition, digestion and metabolism through topics such as energy flow in ruminants, protein systems and net feed efficiency. Laboratories will involve formulation of rations for various physiological states of beef and dairy cattle, economical rations, feed mixes, protein systems (degradable and undegradable protein systems) and net feed efficiency formulations. Graduate students may not register for credit (see AFNS 561). Credit will only be given for one of AFNS 561 and AN SC 461. Prerequisite: AN SC 260 or ★3 NUTR. Corequisite: AN SC 311.

**O AN SC 462 Swine Nutrition**

★3 (fi 6) (second term, 3-0-3). Nutrient utilization and requirements, feed ingredients, and applied feeding programs for swine. Feed formulation strategies and current topics in swine nutrition will be discussed in detail. Graduate students may not register for credit (see AFNS 562). Credit will only be given for one of AFNS 562 and AN SC 462. Prerequisite: AN SC 260 or ★3 NUTR. Corequisite: AN SC 311.

**O AN SC 463 Poultry Nutrition**

★3 (fi 6) (second term, 3-0-3). Nutritional requirements, feeding programs and feed ingredients used for poultry. Feed formulation strategies and current topics in poultry nutrition will be discussed extensively. Graduate students may not register for credit (see AFNS 563). Credit will only be given for one of AFNS 515, 563 and AN SC 463. Prerequisite: AN SC 260 or ★3 NUTR. Corequisite: AN SC 311.

**O AN SC 464 Companion Animal Nutrition**

★3 (fi 6) (first term, 3-0-3). Aimed at fourth year undergraduate students with an interest in companion animal nutrition. The course will focus on nutrient utilization and requirements of dogs and cats. Other companion animal species (mammals, birds, reptiles, fish, amphibians, etc.) will also be covered. Current issues in pet food nutrition and manufacture will be discussed. Prerequisite: AN SC 260 or ★3 Nutrition. Corequisite: AN SC 311 or consent of Instructor.

**O AN SC 471 Applied Poultry Science**

★3 (fi 6) (first term, 3-0-3). Study of avian anatomy, physiology, behavior, and health as it relates to modern poultry production. Current management practices to optimize production efficiency and animal well-being are examined. Graduate students may not register for credit (see AFNS 571). Credit will only be given for one of AFNS 571 and AN SC 471. Prerequisite: AN SC 200 or consent of Instructor.

**O AN SC 472 Applied Dairy Production Science**

★3 (fi 6) (first term, 3-0-3). Examination of the structure of the dairy industry, evaluation of management practices to optimize production efficiency and animal well-being, and integration of nutritional, physiological, and biochemical processes involved in production of quality milk. Laboratories emphasize practical applications, field trips, and discussion. Prerequisite: AN SC 200 and AN SC 260, or consent of Instructor.

**O AN SC 474 Applied Beef Cattle Science**

★3 (fi 6) (first term, 3-0-3). Examination of current and potential future production and management practices to optimize production efficiency and animal well being in the Canadian and international beef industry. Laboratories emphasize

practical applications, field trips, and discussion. Intended for undergraduate students. Graduate students may not register for credit (see AFNS 574). Credit will only be given for one of AFNS 574 and AN SC 474. Prerequisite: AN SC 200 or consent of Instructor.

#### **0 AN SC 476 Applied Swine Science**

★3 (*fi 6*) (second term, 3-0-3). Evaluation of swine breeding, feeding, housing management, and disease prevention practices that optimize production efficiency and animal well-being. Laboratories involve analysis of production practices with a view to optimizing efficiency. Graduate students may not register for credit (see AFNS 576). Credit will only be given for one of AFNS 576 and AN SC 476. Prerequisite: AN SC 200 or consent of Instructor.

#### **AN SC 479 Integrative Problem Solving Project in Animal Science**

★3 (*fi 6*) (either term, 1-2s-3). Students will work in groups with mentors to develop and execute a problem solving project in animal agriculture. Students will explore the chosen issue and provide recommendations that relate to the sustainability of livestock production in Alberta. AN SC 402 or 479 should be taken once in final year to meet capstone requirement. Prerequisite: ★90 or consent of Instructor.

#### **0 AN SC 484 Animal Molecular Biology**

★3 (*fi 6*) (first term, 3-0-0). Lecture and discussion course dealing with concepts in gene expression, gene manipulation, and application of molecular biology to animal biotechnology. Prerequisites: BIOCH 203/205, or 200/310 or PL SC 331 and AN SC 391, or consent of Instructor.

#### **0 AN SC 485 Animal Genetic Improvement**

★3 (*fi 6*) (second term, 3-0-2). Application of genetic/genomic principles and methods to the improvement of livestock and poultry. Topics include Mendelian inheritance, basic concepts of quantitative genetics/genomics, definitions of genetic parameters, principles and methods for genetic evaluation, prediction of genetic change and application of mating systems. Credit will only be given for one of AN SC 385 and 485. Prerequisite: BIOL 207.

#### **AN SC 496 Research on the Human Animal Bond**

★3 (*fi 6*) (first term, 3-0-3). Exploration of research methods and measures; critical appraisal of research on the human-animal bond; application of research findings to the improvement of human and animal welfare. Students will conduct library and empirical research in the laboratory component. Prerequisites: (AN SC 378 and PSYCO 281) or (★90 and consent of instructor).

#### **AN SC 499 Animal Health Science**

★3 (*fi 6*) (either term, 1-0-5). A team-based capstone course to explore broad areas of animal health related to one of the three majors in this program. Students will work in groups with mentors in order to gain integrative and experiential learning and develop skills related to the field. Only open to students with ★90, registered in BSc Animal Health Program. Prerequisite: Consent of Department.

## Graduate Courses

### Notes

- (1) 400-level courses in AN SC may be taken for credit by graduate students under certain circumstances with approval of the student's supervisor or supervisory committee. A 300-level course may be taken for credit by graduate students under certain circumstances with approval of the AFNS Graduate Program Committee. See §174.1.1(1).
- (2) See also Agricultural, Food and Nutritional Science (AFNS) listings for related courses.

## 231.14 Anthropologie, ANTHE

Faculté Saint-Jean

### Cours de 1er cycle

#### **0 ANTHE 101 Introduction à l'anthropologie**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Une introduction à l'anthropologie par l'étude de concepts principaux et d'idées organisatrices tels que l'évolution humaine, l'apparition de la culture, l'organisation sociale, les théories de la culture, les systèmes symboliques, la dynamique de la culture. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en ANTHE 202 ou 201.

#### **0 ANTHE 110 Ethnologie du sexe, de l'âge et du pouvoir**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Dans toute société, le statut social de l'individu et des groupes change au cours du cycle de la vie. Ce cours examine comment l'âge et le sexe privilégient les rôles et le statut social dans des sociétés différentes.

#### **0 ANTHE 207 Introduction à l'anthropologie sociale et culturelle**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Etude comparative de la société et de la culture de l'homme, en particulier dans les communautés nonoccidentales, en insistant sur la famille, la structure sociale, l'économie, les institutions politiques et la religion; les procédures de changement. Préalable(s): ANTHE 101. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment

Guide dans la section University Regulations and Information for Students de l'annuaire.

#### **0 ANTHE 208 Introduction à l'anthropologie linguistique**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Etude anthropologique du langage et de la communication. Aperçu rapide des méthodes d'enquête sur le terrain et des méthodes analytiques et théorie de l'anthropologie linguistique. Préalable(s): ANTHE 101.

#### **0 ANTHE 320 Ethnologie de la religion**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Introduction à l'étude comparative des religions et des phénomènes qui s'y rattachent; tels la magie, les tabous, le chamanisme et la sorcellerie. Des exemples ethnographiques sont utilisés pour appuyer une analyse des liens entre pensées et rites religieux et autres aspects de la vie sociale.

#### **0 ANTHE 365 Culture populaire**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Exploration approfondie de la culture populaire utilisant différentes approches théoriques et l'application des concepts de l'Anthropologie. Préalable(s): ★3 en ANTHE, ou autre science sociale, niveau 100.

#### **ANTHE 393 Culture et santé**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). D'une perspective multiculturelle et comparative : étude des croyances et des activités sociales associées à la santé et la guérison. Préalable(s) : ★3 en ANTHE, ou autre cours de science sociale, niveau 100.

## 231.15 Anthropology, ANTHR

Department of Anthropology  
Faculty of Arts

### Undergraduate Courses

#### **0 ANTHR 101 Introductory Anthropology**

★3 (*fi 6*) (either term, 3-0-0). Approaches to the study of Anthropology through the study of human biological, cultural and linguistic diversity, past and present.

#### **0 ANTHR 110 Gender, Age, and Culture**

★3 (*fi 6*) (either term, 3-0-0). An anthropological review and comparison of cultures in terms of social positions based on differences in sex and age.

#### **0 ANTHR 150 Race and Racism**

★3 (*fi 6*) (either term, 3-0-0). The challenge of racism in modern societies and the response of anthropology, including the history of how the 'race' concept has been used to explain human variation.

#### **ANTHR 206 Introduction to Archaeology**

★3 (*fi 6*) (either term, 2-0-1). Introduction to the nature, purposes, theory and methods of anthropological archaeology. Emphasis on principles of reconstruction of past societies from archaeological evidence and the explanation of cultural evolution. Prerequisite: A 100-level course in ANTHR or consent of Department.

#### **ANTHR 207 Introduction to Social and Cultural Anthropology**

★3 (*fi 6*) (either term, 2-1s-0). Comparative study of human society and culture, particularly non-Western communities, with special attention to the family, social structure, economics and political institutions, and religion; processes of change. Prerequisite: A 100-level course in ANTHR or consent of Department.

#### **ANTHR 208 Introduction to Linguistic Anthropology**

★3 (*fi 6*) (either term, 3-0-0). The anthropological study of language and communication. A brief survey of field and analytical methods and the theory of linguistic anthropology. Prerequisite: A 100-level course in ANTHR or consent of Department.

#### **ANTHR 209 Introduction to Biological Anthropology**

★3 (*fi 6*) (either term, 2-0-1). Survey of theory and basic data in human evolution and human variation. Topics include primatology, osteology, hominoid paleontology, variation in modern populations. Prerequisite: A 100-level course in Anthropology, or the consent of Department.

#### **0 ANTHR 219 World Prehistory**

★3 (*fi 6*) (either term, 3-0-0). A survey of the archaeological evidence for human cultural evolution.

#### **0 ANTHR 230 Anthropology of Science, Technology, and Environment**

★3 (*fi 6*) (either term, 3-0-0). Science as a cultural practice, cultural effects and globalization of technology, changing views of nature, gender and science, traditional ecological knowledge, and the evolution of technology.

#### **0 ANTHR 256 Alberta Archaeology**

★3 (*fi 6*) (either term, 3-0-0). Introduction to Alberta's past as reconstructed by archaeology.

#### **0 ANTHR 286 Topics in Regional Anthropology**

★3 (*fi 6*) (either term, 3-0-0). Consult the Department and/or the schedule of



classes for the specific topics offered. Variable content course which may be repeated if topic(s) vary.

**0 ANTHR 287 Topics in Asian Anthropology**

★3 (*fi 6*) (either term, 3-0-0). Consult the Department and/or the schedule of classes for the specific topics offered. Variable content course which may be repeated if topic(s) vary.

**ANTHR 310 The Anthropology of Gender**

★3 (*fi 6*) (either term, 3-0-0). A comparative, cross-cultural, and cross-species perspective on biological and social aspects of sex and gender differences. Prerequisite: ANTHR 110 or 207 or 209 or consent of Department. Offered in alternate years.

**ANTHR 311 North American Prehistory**

★3 (*fi 6*) (either term, 3-0-0). A survey of prehistory and cultural development in North America. Prerequisite: ANTHR 206 or consent of Department.

**ANTHR 312 Lower Palaeolithic Prehistory**

★3 (*fi 6*) (either term, 3-0-0). Development of prehistoric culture in Europe, Africa and Asia during the Lower Palaeolithic. Prerequisite: ANTHR 206 or consent of Department. Offered in alternate years.

**ANTHR 313 Middle and Upper Palaeolithic Prehistory**

★3 (*fi 6*) (either term, 3-0-0). Development of prehistoric culture in Europe, Africa, and Asia during the Middle and Upper Palaeolithic. Prerequisite: ANTHR 206 or consent of Department. Offered in alternate years.

**ANTHR 318 Political Anthropology**

★3 (*fi 6*) (either term, 3-0-0). Introduction to modern political anthropology with emphasis on origins of state structure, relations between non-state and state societies, and problems of pluralism and stratification. Prerequisite: ANTHR 207 or consent of Department. Offered in alternate years.

**ANTHR 320 Anthropology of Religion**

★3 (*fi 6*) (either term, 3-0-0). Survey of anthropological approaches to religions and related phenomena including magic, taboo, shamanism and witchcraft. Emphasis on the connection between religious ideas and practices and other aspects of social life in a variety of cultures. Prerequisite: ANTHR 207 or consent of Department.

**ANTHR 321 Religions of China in Practice**

★3 (*fi 6*) (either term, 3-0-0). Contemporary Chinese religious culture as practiced in the family, community, voluntary associations, and the political sphere. Prerequisite: ANTHR 207 or 278 or consent of Department. Offered in alternate years.

**ANTHR 322 Anthropological Perspectives on Discursive Practices**

★3 (*fi 6*) (either term, 3-0-0). Cultural constructions of narrative and discourse; interethnic communication, including discourse in the courtroom, classroom, and work settings; code choice; and communication via electronic media. Prerequisite: ANTHR 208 or consent of Department. Offered in alternate years.

**ANTHR 323 Ecological Anthropology**

★3 (*fi 6*) (either term, 3-0-0). A consideration of the relationships between culture and the environment. Problems involving the application of basic ecological concepts and principles to human societies and evaluation of various explanatory frameworks regarding cultural adaptations. Prerequisite: ANTHR 206 or 207 or consent of Department.

**ANTHR 324 Economic Anthropology**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the literature and controversies within the field, emphasizing systems of exchange. Prerequisite: ANTHR 207 or consent of Department. Offered in alternate years.

**ANTHR 332 Anthropology of Science**

★3 (*fi 6*) (either term, 3-0-0). Contemporary views of the nature of science, including debates about science's universalism, objectives, and culture-bound epistemologies. Prerequisite: ANTHR 230, or one of 206 to 209, or consent of Department. Offered in alternate years.

**ANTHR 350 Kinship and Social Structure**

★3 (*fi 6*) (either term, 3-0-0). Anthropological approaches to kinship systems and other concepts of social organization, emphasizing non-western societies. Prerequisite: ANTHR 207 or 213 or consent of Department. Note: Not open to students with credit in ANTHR 351, 413, or 450. Offered in alternate years.

**ANTHR 372 Anthropology of Food**

★3 (*fi 6*) (either term, 3-0-0). Examination of the relationship between food and culture through historical and cross-cultural analysis of foodways. Prerequisite: ANTHR 207 or consent of Department. Offered in alternate years.

**ANTHR 373 Anthropology of the Human Lifecycle**

★3 (*fi 6*) (either term, 3-0-0). Processes of human growth and development in a bio-cultural framework. Prerequisite: ANTHR 207 or 209 or consent of Department. Offered in alternate years.

**ANTHR 385 Topics in Social Cultural Anthropology**

★3 (*fi 6*) (either term, 0-3s-0). Consult the Department for the specific topics offered and any recommended courses to be completed prior to registering.

**ANTHR 390 Human Osteology**

★3 (*fi 6*) (either term, 3-0-3). Lecture and laboratory study of human skeletal biology, emphasizing the identification of bones and an understanding of human functional anatomy. Prerequisite: ANTHR 209 or consent of Department.

**ANTHR 391 Hominid Evolution**

★3 (*fi 6*) (either term, 3-0-0). A survey of the fossil evidence for human evolution. Prerequisite: ANTHR 209 or consent of Department.

**ANTHR 393 Health and Healing**

★3 (*fi 6*) (either term, 3-0-0). A cross-cultural study through time of the beliefs and social activities associated with health, illness and healing. Prerequisite: ANTHR 101 or consent of Department.

**ANTHR 396 Archaeological Field Training**

★6 (*fi 12*) (Spring/Summer, 3-0-3). Instruction in all practical aspects of archaeological field techniques, including excavation, survey, recording, photography, and conservation. This course can be applied to the Canadian content requirement when held at a Canadian site. Prerequisites: ANTHR 206 or equivalent, and consent of Department. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**ANTHR 401 Ethnographic Methods**

★3 (*fi 6*) (either term, 0-3s-0). Discussion of issues in methodology and field methods. Restricted to senior undergraduate students. Prerequisite: ANTHR 207 or consent of Department. Offered in alternate years.

**ANTHR 404 Mortuary Archaeology**

★3 (*fi 6*) (either term, 0-3s-0). Theory and method applied to the interpretation of treatment of the dead in prehistoric and historic contexts. Prerequisite: ANTHR 206 or 209, or consent of Department.

**ANTHR 407 Paleopathology**

★3 (*fi 6*) (either term, 2-0-1). A detailed survey of disease processes in antiquity as expressed in skeletal and preserved tissues. Prerequisite: ANTHR 390 or consent of Department. Offered in alternate years.

**ANTHR 415 History of Anthropological Theory**

★3 (*fi 6*) (either term, 3-0-0). Major theoretical trends in social and cultural anthropology in the nineteenth and twentieth centuries. Prerequisites: ANTHR 207 or 208 and a 300- or 400-level anthropology course, or consent of Department.

**ANTHR 416 History of Linguistic Anthropology**

★3 (*fi 6*) (either term, 3-0-0). Major theoretical trends in linguistic anthropology presented in a historical context. Prerequisite: ANTHR 208 or any other 200-level ANTHR course or consent of Department. Offered in alternate years.

**ANTHR 417 Anthropology of Modernity**

★3 (*fi 6*) (either term, 0-3s-0). The course investigates recent works that theorize modernity (globalization, transnationalism, the impact of new technologies) from an ethnographic perspective. Prerequisite: ANTHR 207 or 208 and a 300- or 400-level ANTHR course, or consent of Department. Offered in alternate years.

**ANTHR 420 Anthropology and the Twentieth Century**

★3 (*fi 6*) (either term, 3-0-0). The relationship between the development of anthropological theory across the twentieth century and the emergence of "new social movements" organized around anti-colonialism, anti-racism, feminism, ethnicity, the environment, gender, sexuality, disability, and identity. Prerequisite: ANTHR 207 or consent of Department. Offered in alternate years.

**ANTHR 422 Anthropological Approaches to Verbal Art**

★3 (*fi 6*) (either term, 3-0-0). A review of anthropological approaches to verbal performances in various cultures. Attention to narrative forms, including myth, folklore and oral history, and to ritual language, including oratory and prayer. Prerequisite: ANTHR 207 or 208 or consent of Department. Offered in alternate years.

**ANTHR 424 Visual Anthropology**

★3 (*fi 6*) (either term, 0-3s-0). Introduction to visual media and visualization in the creation, reproduction and comprehension of culture over time, and the use of imagery in describing the anthropological subject. Prerequisite: consent of Department. Offered in alternate years.

**ANTHR 436 Ethnography of Communication**

★3 (*fi 6*) (either term, 1-0-2). Data collection and analysis of communicative competence, that is, how speakers interact in a given community. Prerequisite: Any 200-level course in ANTHR, or consent of Department. Offered in alternate years.

**ANTHR 437 Language, Ethnicity, and Nationalism**

★3 (*fi 6*) (either term, 0-3s-0). The impact of nationalism on language and culture in a variety of societies. Topics include development of national cultures and national languages; bilingualism and the creolization of language and culture; status of ethnic minorities; linguistic and cultural grounds for separatist movements; maintenance of transnational linkages in diaspora communities. Prerequisites: ANTHR 207, or 208 or consent of Department. Offered in alternate years.

**ANTHR 438 Language Use and Issues in the Circumpolar World**

★3 (*fi 6*) (either term, 0-3s-0). Languages in the circumpolar world in the



contemporary context. Discussion of language laws and policies in northern regions. Study of linguistic behavior in specific communities. Prerequisite: any 200-level ANTHR course or consent of Department. Offered in alternate years.

**ANTHR 439 Anthropological Perspectives on the Military**

★3 (fi 6) (either term, 0-3s-0). Cultural and linguistic aspects of military life and affairs, including discussion of diversity in the militaries, and language use and issues in the military context. Prerequisite: 200-level ANTHR course or consent of Department.

**ANTHR 440 Anthropological Analysis of Linguistic Communities**

★3 (fi 6) (either term, 0-3s-0). Review and critical discussion of the notion of linguistic community as a theoretical concept and a descriptive tool in anthropology. Prerequisite: 200-level ANTHR course or consent of Department.

**ANTHR 443 Juvenile Osteology**

★3 (fi 6) (either term, 2-0-1). Study of the juvenile skeleton, treating development and identification of juvenile skeletal elements. Other topics include the theory and practice of determining juvenile age at death and the study of juvenile health and childrearing practices in past populations using skeletal remains. Prerequisite: ANTHR 390, or consent of Department. Offered in alternate years.

**ANTHR 460 Nutritional Anthropology**

★3 (fi 6) (either term, 0-3s-0). Interrelationship between food, culture and biology from local and global perspectives. Prerequisite: ANTHR 372 or consent of Department. Offered in alternate years.

**ANTHR 464 Chemical Analysis of Bone**

★3 (fi 6) (either term, 0-3s-0). Survey of current research on the stable isotope and aDNA analysis of archaeological human and faunal remains. Prerequisite: ANTHR 390, or consent of Department. Offered in alternate years.

**ANTHR 471 Readings in Anthropology**

★3 (fi 6) (either term, 0-3s-0). Individual research project conducted under the direction of a Department faculty member. Prerequisite: consent of Department.

**ANTHR 472 Independent Research**

★3 (fi 6) (either term, 0-0-3). Individual research project involving significant laboratory work conducted under the direction of a Department faculty member. Prerequisite: consent of Department.

**ANTHR 474 Northwest Coast Societies from an Anthropological Perspective**

★3 (fi 6) (either term, 0-3s-0). A survey of the cultures of the Northwest Coast from Yakutat Bay to the Columbia River. Cultures will be examined from the perspectives of the ethnographic present, historical change, and current developments. Focal areas include social structure, kinship, economic systems, material culture, ethnoaesthetics, winter dance ceremonial complexes, and language. Prerequisite: ANTHR 207 or 250 or consent of Department. Offered in alternate years.

**ANTHR 476 Palaeodietary Reconstruction**

★3 (fi 6) (either term, 0-3s-0). Survey of methods used to reconstruct past human diets, with an emphasis on those that involve the study of human remains. Prerequisite: ANTHR 206 or 209 or consent of Department. Offered in alternate years.

**ANTHR 477 Northwest Coast Archaeology**

★3 (fi 6) (either term, 0-3s-0). The examination of the long-term human occupation of the coastal areas from southeast Alaska to northern California. Prerequisite: ANTHR 206 or consent of Department. Offered in alternate years.

**ANTHR 479 Geoarchaeology**

★3 (fi 6) (either term, 3-0-3). Application of earth science methods to archaeological research. Prerequisites: EAS 101 or 201 and ANTHR 206, or consent of Department. Offered in alternate years.

**ANTHR 480 Zooarchaeology**

★3 (fi 6) (either term, 2-0-1). Exploration of methodological and theoretical issues in zooarchaeology through the study of animal remains from archaeological contexts. Prerequisite: ANTHR 206 or consent of Department. Offered in alternate years.

**ANTHR 481 Development of Anthropological Archaeology**

★3 (fi 6) (either term, 3-0-0). A survey of approaches and practices used in archaeology; concepts and models used for interpreting archaeological data and cultural history; relation of culture historical explanations to general anthropological theory. Prerequisites: ANTHR 206 and a 300- or 400-level anthropology course, or consent of Instructor. Offered in alternate years.

**ANTHR 482 Topics in Linguistic Anthropology**

★3 (fi 6) (either term, 0-3s-0). Consult the Department for the specific topics offered and any recommended courses to be completed prior to registering.

**ANTHR 483 Topics in Biological Anthropology**

★3 (fi 6) (either term, 3-0-0). Consult the Department for the specific topics offered. Prerequisite: ANTHR 390 or consent of Department.

**ANTHR 484 Topics in Archaeology and/or Biological Anthropology**

★3 (fi 6) (either term, 0-3s-0). Consult the Department for the specific topics offered and any recommended courses to be completed prior to registering.

**ANTHR 485 Topics in Social and Cultural Anthropology**

★3 (fi 6) (either term, 0-3s-0). Consult the Department for the specific topics offered and any recommended courses to be completed prior to registering.

**ANTHR 486 Seminar in Archaeology and/or Biological Anthropology**

★3 (fi 6) (either term, 0-3s-0). Consult the Department for the specific topics offered and any recommended courses to be completed prior to registering.

**ANTHR 487 Seminar in Social and Cultural Anthropology**

★3 (fi 6) (either term, 0-3s-0). Consult the Department for the specific topics offered and any recommended courses to be completed prior to registering.

**ANTHR 488 Quaternary Pollen Analysis**

★3 (fi 6) (either term, 3-0-3). Prerequisite: consent of Department. Offered in alternate years.

**ANTHR 490 Human Osteoarchaeology**

★3 (fi 6) (either term, 3-0-0). The analysis and interpretation of data obtained from human skeletal and dental remains from archaeological sites. Prerequisite: ANTHR 390 or consent of Department. Offered in alternate years.

**ANTHR 491 Stone Tools**

★3 (fi 6) (either term, 3-0-0). A methodological and theoretical introduction to the analysis of stone tools. Prerequisites: ANTHR 206 and one other 400-level course in Anthropology or consent of Department. Offered in alternate years.

**ANTHR 494 Forensic Anthropology**

★3 (fi 6) (either term, 0-3s-0). Human skeletal individualization and its application to human death investigation. Prerequisite: ANTHR 390 or 490 or consent of Department.

**ANTHR 495 Archaeological Methods**

★3 (fi 6) (either term, 3-0-0). The application of archaeological theory and methods to field and laboratory problems. Prerequisites: ANTHR 206 and one other 400-level course in Anthropology, or consent of Department. Offered in alternate years.

**ANTHR 498 History of Biological Anthropology**

★3 (fi 6) (either term, 3-0-0). A survey of the development of theory and method in biological anthropology. Prerequisites: ANTHR 209 and a 300- or 400-level ANTHR, or consent of Department. Offered in alternate years.

**ANTHR 499 Honors Seminar and Research Project**

★6 (fi 12) (two term, 0-3s-0). A review and discussion of contemporary issues in Anthropology leading to the conception, preparation, and completion of the BA Honors essay under the supervision of an individual faculty member. Note: Not open to students with credit in ANTHR 400 or 450.

## Graduate Courses

**Note:** All Department of Anthropology graduate courses are closed to web registration and require consent of Department.

**ANTHR 500 MA Thesis Prospectus**

★3 (fi 6) (either term, 0-3s-0). Preparation of a research proposal leading to the MA thesis. The prospectus will state the proposed research problem, and demonstrate the theoretical and methodological knowledge required to complete the research.

**ANTHR 501 MA Colloquium**

★3 (fi 6) (first term, 0-3s-0). Readings, presentations, and discussions of staff research, recent advances and current issues in the four fields of anthropology. Limited to new MA students

**ANTHR 504 Advanced Mortuary Archaeology**

★3 (fi 6) (either term, 0-3s-0). Theory and method applied to the interpretation of treatment of the dead in prehistoric and historic contexts.

**ANTHR 511 Ethnographic Field Methods**

★3 (fi 6) (either term, 0-3s-0). Not open to students with credit in ANTHR 401 or 505. Offered in alternate years.

**ANTHR 517 Anthropology of Modernity**

★3 (fi 6) (either term, 0-3s-0). Investigates recent works that theorize modernity (globalization, transnationalism, the impact of new technologies) from an ethnographic perspective. Offered in alternate years.

**ANTHR 520 Anthropology and the Twentieth Century**

★3 (fi 6) (either term, 3-0-0). The relationship between the development of anthropological theory across the twentieth century and the emergence of "new social movements" organized around anti-colonialism, anti-racism, feminism, ethnicity, the environment, gender, sexuality, disability, and identity. Offered in alternate years.

**ANTHR 521 Topics in Medical Anthropology**

★3 (fi 6) (either term, 0-3s-0). Consult the Department and/or the University timetable for the specific topics offered.

**ANTHR 524 Visual Anthropology**

★3 (fi 6) (either term, 0-3s-0). Introduction to visual media and visualization in

the creation, reproduction and comprehension of culture over time, and the use of imagery in describing the anthropological subject. Offered in alternate years.

#### **ANTHR 536 Ethnography of Communication**

★3 (*fi 6*) (either term, 1-0-2). Data collection and analysis of communicative competence, that is, how speakers interact in a given community. Offered in alternate years.

#### **ANTHR 537 Language, Ethnicity, and Nationalism**

★3 (*fi 6*) (either term, 0-3s-0). The impact of nationalism on language and culture in a variety of societies. Topics include development of national cultures and national languages; bilingualism and the creolization of language and culture; status of ethnic minorities; linguistic and cultural grounds for separatist movements; maintenance of transnational linkages in diaspora communities. Not open to students with credit in ANTHR 437. Offered in alternate years

#### **ANTHR 538 Language Use and Issues in the Circumpolar World**

★3 (*fi 6*) (either term, 0-3s-0). Languages in the circumpolar world in the contemporary context. Discussion of language laws and policies in northern regions. Study of linguistic behavior in specific communities. Offered in alternate years.

#### **ANTHR 539 Advanced Anthropological Perspectives on the Military**

★3 (*fi 6*) (either term, 0-3s-0). Advanced study of the cultural and linguistic aspects of military life and affairs, including discussion of diversity in the militaries, and language use and issues in the military context.

#### **ANTHR 540 Anthropological Analysis of Linguistic Communities**

★3 (*fi 6*) (either term, 0-3s-0). Review and critical discussion of the notion of linguistic community as a theoretical concept and a descriptive tool in anthropology.

#### **ANTHR 543 Advanced Juvenile Osteology**

★3 (*fi 6*) (either term, 2-0-1). Study of the juvenile skeleton, treating development and identification of juvenile skeletal elements. Other topics include the theory and practice of determining juvenile age at death and the study of juvenile health and childrearing practices in past populations using skeletal remains. Offered in alternate years.

#### **ANTHR 560 Advanced Nutritional Anthropology**

★3 (*fi 6*) (either term, 0-3s-0). Advanced seminar on the interrelationship between food, culture and biology from local and global perspectives. Offered in alternate years.

#### **ANTHR 564 Advanced Chemical Analysis of Bone**

★3 (*fi 6*) (either term, 3-0-0). Survey of current research on the stable isotope and aDNA analysis of archaeological human and faunal remains. Offered in alternate years.

#### **ANTHR 571 Advanced Readings in Anthropology**

★3 (*fi 6*) (either term, 0-3s-0). Individual research project conducted under the direction of a Department faculty member.

#### **ANTHR 572 Independent Research**

★3 (*fi 6*) (either term, 0-0-3). Individual research project involving significant laboratory or field work conducted under the supervision of a Department faculty member.

#### **ANTHR 576 Advanced Palaeodietary Reconstruction**

★3 (*fi 6*) (either term, 0-3s-0). Advanced survey of methods used to reconstruct past human diets, with an emphasis on those that involve the study of human remains. Offered in alternate years.

#### **ANTHR 577 Advanced Northwest Coast Archaeology**

★3 (*fi 6*) (either term, 0-3s-0). The examination of the long-term human occupation of the coastal areas from southeast Alaska to northern California. Offered in alternate years.

#### **ANTHR 580 Advanced Zooarchaeology**

★3 (*fi 6*) (either term, 2-0-1). Exploration of methodological and theoretical issues in zooarchaeology through the study of animal remains from archaeological contexts. Offered in alternate years.

#### **ANTHR 582 Advanced Topics in Linguistic Anthropology**

★3 (*fi 6*) (either term, 0-3s-0). Consult the Department and/or the University timetable for the specific topics offered.

#### **ANTHR 584 Advanced Topics in Archaeology and/or Biological Anthropology**

★3 (*fi 6*) (either term, 0-3s-0). Consult the Department and/or the schedule of classes for the specific topics offered.

#### **ANTHR 585 Advanced Topics in Social and Cultural Anthropology**

★3 (*fi 6*) (either term, 0-3s-0). Consult the Department and/or the University timetable for the specific topics offered.

#### **ANTHR 586 Advanced Seminar in Archaeology and/or Biological Anthropology**

★3 (*fi 6*) (either term, 0-3s-0). Consult the Department and/or the schedule of classes for the specific topics offered.

#### **ANTHR 587 Advanced Seminar in Social and Cultural Anthropology**

★3 (*fi 6*) (either term, 0-3s-0). Consult the Department and/or the University timetable for the specific topics offered.

#### **ANTHR 589 Advanced Seminar in Linguistic Anthropology**

★3 (*fi 6*) (either term, 0-3s-0). Consult the Department and/or the University timetable for the specific topics offered.

#### **ANTHR 593 Evolution and Social Life**

★3 (*fi 6*) (either term, 0-3s-0). Current perspectives on human biological, social and cultural evolution. Offered in alternate years.

#### **ANTHR 598 Landscape and Culture**

★3 (*fi 6*) (either term, 0-3s-0). Cultural experiences and representations of landscape.

#### **ANTHR 600 PhD Thesis Prospectus**

★3 (*fi 6*) (either term, 0-3s-0). Preparation of a research proposal leading to the PhD thesis. The prospectus states the proposed research problem, and demonstrates the theoretical and methodological knowledge required to complete the research.

#### **ANTHR 601 PhD Colloquium**

★3 (*fi 6*) (first term, 0-3s-0). Readings, presentations, and discussions of staff research, recent advances and current issues in the four fields of anthropology. Limited to new PhD students. Optional for students with credit in ANTHR 501

## 231.16 Arabic, ARAB

Department of Modern Languages and Cultural Studies  
Faculty of Arts

#### **Notes**

- (1) The Department reserves the right to place students in the language course appropriate to their level of language skill.
- (2) Placement tests may be administered in order to assess prior background. Students with an Arabic language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in a more advanced course suitable to their level of ability. Students seeking to fulfill their Language Other than English requirement may begin at any one appropriate level, but must take the full ★6 in one language.
- (3) The Department will withhold credit from students completing courses for which prior background is deemed to make them ineligible. For example, 100-level courses are normally restricted to students with little or no prior knowledge in that language. Should a student with matriculation standing, or those possessing prior background (such as native speakers or those for whom it is their first language) register in the 100-level course, credit may be withheld.

### Undergraduate Courses

#### **0 ARAB 111 Beginners' Arabic I**

★3 (*fi 6*) (either term, 5-0-0). Introduction to pronunciation, reading, writing, and conversation. Note: not to be taken by students with native or near native proficiency, or Arabic 35 or its equivalents in Canada and other countries. Not open to students with credit in ARAB 100.

#### **0 ARAB 112 Beginners' Arabic II**

★3 (*fi 6*) (either term, 5-0-0). Continuation of ARAB 111. Prerequisite: ARAB 111 or consent of Department. Note: not to be taken by students with native or near native proficiency, or Arabic 35 or its equivalents in Canada and other countries. Not open to students with credit in ARAB 100.

#### **0 ARAB 211 Intermediate Arabic I**

★3 (*fi 6*) (either term, 4-0-0). Continuation of ARAB 112, emphasizing building an extensive vocabulary in everyday situations. Prerequisite: ARAB 112 or consent of Department. Note: not open to students with credit in ARAB 301 or 302.

#### **0 ARAB 212 Intermediate Arabic II**

★3 (*fi 6*) (either term, 4-0-0). Exercises in comprehension, translation and composition. Further study of grammar. Prerequisite: ARAB 211 or consent of Department. Note: not open to students with credit in ARAB 301 or 302.

## 231.17 Art, ART

Department of Art and Design  
Faculty of Arts

**Note:** Because presence at lectures and seminars, participation in classroom discussion, and the completion of assignments are important components of most courses, regular attendance is expected.

This applies particularly to studio courses where attendance is a factor in grading.

Students are expected to have successfully completed prerequisite course(s) with a minimum grade of B-. Consent of Department may be withheld in cases where the grade in a prerequisite course is below a B-.

## Undergraduate Courses

### ART 134 Art Fundamentals

★3 (fi 6) (either term, 0-6L-0). Studio-based exploration of both visual and conceptual Fine Art concerns in two- and three-dimensions. Note: ART 134 and DES 135 are required prerequisites for senior level ART or DES courses. Not open to students with credit in ART 131 or 132.

### ART 136 Art Fundamentals I

★3 (fi 6) (first term, 0-6L-0). Studio-based exploration of both visual and conceptual Fine Art concerns in two- and three-dimensions. Note: Restricted to BFA and BDesign students.

### ART 137 Art Fundamentals II

★3 (fi 6) (second term, 0-6L-0). Further study of studio-based exploration of both visual and conceptual Fine Art concerns in two- and three-dimensions. Note: Restricted to BFA and BDesign students. Prerequisite: ART 136.

### ART 140 Drawing I

★3 (fi 6) (either term, 0-6L-0). Study of the principles and techniques of drawing. Note: Restricted to BFA and BDesign students. Pre- or corequisites: ART 136, 137, DES 138, 139 and consent of Department.

### ART 240 Drawing I

★3 (fi 6) (either term, 0-6L-0). Study of the principles and techniques of drawing. Note: Restricted to BA and BEd Art and Design Majors. Prerequisites: ART 134 and DES 135 and consent of Department. Not open to students with credit in ART 140.

### ART 268 Introduction to Studio

★3 (fi 6) (first term, 0-6L-0). Directed study in one subject embraced by ART 322. Prerequisites: ART 134 and DES 135 or ART 136 and DES 138 and consent of Department. Note: Restricted to students in the Faculty of Education.

### ART 310 Painting: Introductory Studies I

★3 (fi 6) (first term, 0-6L-0). Introduction to the principles, concepts, and techniques of painting. Projects based on observation with reference to both historical and contemporary examples. Acrylic medium. Prerequisites: ART 134 and DES 135 or ART 136 and DES 138 and consent of Department. Note: Not open to students with credit in ART 312.

### ART 311 Painting: Introductory Studies II

★3 (fi 6) (second term, 0-6L-0). Continued exploration of the principles, concepts and techniques of painting. Projects based on observation with reference to both historical and contemporary examples. Oil medium. Prerequisites: ART 310 and consent of Department. Note: Not open to students with credit in ART 312.

### ART 316 Painting: Introductory Studies III

★3 (fi 6) (first term, 0-6L-0). Additional exploration in painting for students wishing more in-depth study at the introductory level. Acrylic and oil media. Pre- or corequisites: ART 310 and consent of Department. Note: Not open to students with credit in ART 313.

### ART 317 Painting: Introductory Studies IV (Life Painting)

★3 (fi 6) (second term, 0-6L-0). Introduction to painting the figure with emphasis on working from the life model. Prerequisites: ART 310, 316, and prerequisite or corequisite: ART 311, and consent of Department. Note: Not open to students with credit in ART 313.

### ART 322 Printmaking: Introductory Studies I

★6 (fi 12) (two term, 0-6L-0). Introduction to the principles and technical applications of printmaking through the study of screen printing, intaglio and relief process. Prerequisites: ART 134 and DES 135 or ART 136 and DES 138 and consent of Department.

### ART 337 Special Projects in Studio Disciplines

★6 (fi 12) (two term, 0-6L-0). Special projects in studio disciplines not normally available under existing courses. Normally offered in Spring/Summer. Prerequisites: ART 134 and DES 135 or ART 136 and DES 138 and consent of Department.

### ART 338 Special Projects in Studio Disciplines

★3 (fi 6) (either term, 0-6L-0). Special projects in studio disciplines not normally available under existing courses. Prerequisites: ART 134 and DES 135 or ART 136 and DES 138 and consent of Department.

### ART 339 Special Projects in Drawing

★6 (fi 12) (two term, 0-6L-0). Special drawing projects not normally available under existing courses. Note: BFA and BDesign students may use ART 339 in lieu of ART 140/340 upon consent of Department. Prerequisites: ART 134 and DES 135, or ART 136 and DES 138 and consent of Department.

### ART 340 Drawing II

★3 (fi 6) (either term, 0-6L-0). Development and application of techniques and concepts of drawing with emphasis on drawing from the life model. Prerequisite: ART 140 or ART 240 and consent of department.

### ART 361 Sculpture: Introductory Studies in Abstract Sculpture

★3 (fi 6) (either term, 0-6L-0). Foundation studies in abstract sculpture. Prerequisites: ART 134 and DES 135, or ART 136 and DES 138 and consent of Department.

Corequisite: Normally ART 362, to be taken in the same academic year. Not open to students with credit in ART 362 ★6 offered prior to 1992-93.

### ART 362 Sculpture: Introductory Studies in Figurative Sculpture

★3 (fi 6) (either term, 0-6L-0). Foundation studies in figurative sculpture. Prerequisites: ART 134 and DES 135, or ART 136 and DES 138, and consent of Department. Corequisite: Normally ART 361, to be taken in the same academic year. Not open to students with credit in ART 362 ★6 offered prior to 1992-93.

### ART 365 Sculpture: Introductory Studies III

★3 (fi 6) (first term, 0-6L-0). Further foundation studies in sculpture. Pre or corequisites: ART 361 and 362 and consent of the Department. Note: Not open to students with credit in ART 363 (★6).

### ART 366 Sculpture: Introductory Studies IV

★3 (fi 6) (second term, 0-6L-0). Further foundation studies in sculpture. Pre or corequisites: ART 361 and 362 and consent of the Department. Note: Not open to students with credit in ART 363 (★6).

### ART 410 Painting: Intermediate Studies I

★3 (fi 6) (first term, 0-6L-0). A project based course exploring principles, concepts and techniques of painting. Prerequisites: ART 310, 311 and consent of Department. Note: Not open to students with credit in ART 412.

### ART 411 Painting: Intermediate Studies II

★3 (fi 6) (second term, 0-6L-0). Further study of advanced principles, concepts and techniques of painting, leading to self-initiated projects. Prerequisites: ART 410 and consent of Department. Note: Not open to students with credit in ART 412.

### ART 418 Painting: Intermediate Figure Studies I

★3 (fi 6) (first term, 0-6L-0). Further study in painting the figure with emphasis on painting from the life model. Prerequisites: ART 310, 311, 317, and prerequisite or corequisite ART 410 and consent of Department. Note: Not open to students with credit in ART 414.

### ART 419 Painting: Intermediate Figure Studies II

★3 (fi 6) (second term, 0-6L-0). Further study in painting the figure with emphasis on painting from the life model. Prerequisites: ART 418 and consent of Department. Note: Not open to students with credit in ART 414.

### ART 422 Printmaking: Intermediate Studies I

★6 (fi 12) (two term, 0-6L-0). Study of the principles and technical applications of printmaking with an emphasis on lithography and etching. Prerequisites: ART 322 and consent of Department.

### ART 425 Word and Image: Intermediate Projects in Printmaking for Artists and Designers

★6 (fi 12) (two term, 0-6L-0). Exploration of the multiple relationships between word and image generated through consideration of text. Prerequisite: ART 322. Corequisite: ART 422. Note: ART 425 and DES 425 will be taught in conjunction. Registration priority given to BDesign Printmaking Route students registering in DES 425. Not open to students who have successfully completed DES 425.

### ART 437 Special Projects in Studio Disciplines

★6 (fi 12) (two term, 0-6L-0). Special projects in studio disciplines not normally available under existing courses. Normally offered in Spring/Summer. Prerequisite: consent of Department.

### ART 438 Special Projects in Studio Disciplines

★3 (fi 6) (either term, 0-6L-0). Special projects in studio disciplines not normally available under existing courses. Prerequisite: consent of Department.

### ART 439 Special Projects in Drawing: Intermediate

★6 (fi 12) (two term, 0-6L-0). Normally offered in Spring/Summer. Prerequisites: ART 140 and 340, or 339 and consent of Department.

### ART 440 Drawing: Intermediate Studies

★3 (fi 6) (first term, 0-6L-0). Further study and application of the techniques and concepts of drawing. Note: Restricted to BFA and BDesign students. Prerequisite: ART 339 or ART 340.

### ART 441 Drawing: Intermediate Studies

★3 (fi 6) (second term, 0-6L-0). Further study and application of techniques and concepts of drawing. Note: Restricted to BFA and BDesign students. Prerequisite: ART 440. Not open to students with credit in ART 440 (★6) offered prior to 1995-96.

### ART 450 Installation Art: Intermediate Studies

★3 (fi 6) (either term, 0-6L-0). Study and application of techniques and concepts of installation art. Prerequisites: a minimum of ★12 in 300-level ART courses, and consent of Department.

### ART 465 Sculpture: Intermediate Studies I

★3 (fi 6) (first term, 0-6L-0). Intermediate studies in sculpture. Prerequisites: ART 361 and 362 and/or consent of the Department. Note: Not open to students with credit in ART 462 (★6).

### ART 466 Sculpture: Intermediate Studies II

★3 (fi 6) (second term, 0-6L-0). Intermediate studies in sculpture. Prerequisites: ART 465 and consent of the Department. Note: Not open to students with credit in ART 462 (★6).



**L ART 467 Sculpture: Intermediate Studies III**

★3 (*fi 6*) (first term, 0-6L-0). Further intermediate studies in sculpture. Pre or corequisites: ART 465 and 466 and/or consent of the Department. Note: Not open to students with credit in ART 463 (★6).

**L ART 468 Sculpture: Intermediate Studies IV**

★3 (*fi 6*) (second term, 0-6L-0). Further intermediate studies in sculpture. Pre or corequisites: ART 465 and 466 and/or consent of the Department. Note: Not open to students with credit in ART 463 (★6).

**L ART 510 Painting: Advanced Studies I**

★3 (*fi 6*) (first term, 0-6L-0). Individual directed study in a studio/workshop environment. Prerequisites: ART 410, 411 and consent of Department. Note: Not open to students with credit in ART 512.

**L ART 511 Painting: Advanced Studies II**

★3 (*fi 6*) (second term, 0-6L-0). Individual directed study in a studio/workshop environment. Prerequisites: ART 510 or 516 and/or consent of Department. Note: Not open to students with credit in ART 512.

**L ART 516 Painting: Advanced Studies III**

★3 (*fi 6*) (first term, 0-6L-0). Individual directed study in a studio/workshop environment. Prerequisites: ART 410, 411 and consent of Department. Note: Not open to students with credit in ART 513.

**L ART 517 Painting: Advanced Studies IV**

★3 (*fi 6*) (second term, 0-6L-0). Individual directed study in a studio/workshop environment. Prerequisites: ART 510 or 516 and/or consent of Department. Note: Not open to students with credit in ART 513.

**ART 518 Painting: Advanced Figure Studies V**

★3 (*fi 6*) (first term, 0-6L-0). Individual directed study in a studio/workshop environment emphasizing the human figure as subject matter. Prerequisites: ART 418, 419 and prerequisite or corequisite: ART 510 or 516 and/or consent of Department. Note: Not open to students with credit in ART 514.

**ART 519 Painting: Advanced Figure Studies VI**

★3 (*fi 6*) (second term, 0-6L-0). Individual directed study in a studio/workshop environment emphasizing the human figure as subject matter. Prerequisites: ART 518 or ART 418, 419 and one of ART 510, 516 and/or consent of Department. Note: Not open to students with credit in ART 514.

**L ART 522 Printmaking: Advanced Studies I**

★6 (*fi 12*) (two term, 0-6L-0). Advanced study of the principles and technical applications of printmaking emphasizing mixed media and photographic techniques. Prerequisites: ART 422 and consent of Department.

**L ART 524 Printmaking: Advanced Studies III**

★6 (*fi 12*) (two term, 0-6L-0). Advanced individual study of drawing and other image-making processes and their application in printmaking. Pre- or corequisites: ART 522 and consent of Department.

**L ART 525 Word and Image: Advanced Projects in Printmaking for Artists and Designers**

★6 (*fi 12*) (two term, 0-6L-0). Exploration of the multiple relationships between word and image generated through consideration of text. Prerequisite: ART 422 and ART 425. Corequisite: ART 522. Note: ART 525 and DES 525 are taught in conjunction. Registration priority given to BDesign Printmaking Route students registering in DES 525. Not open to students who have successfully completed DES 525.

**ART 537 Special Projects in Studio Disciplines**

★6 (*fi 12*) (two term, 0-6L-0). Special projects in studio disciplines not normally available under existing courses. Normally offered in Spring/Summer. Prerequisite: consent of Department.

**ART 538 Special Projects in Studio Disciplines**

★3 (*fi 6*) (either term, 0-6L-0). Special projects in studio disciplines not normally available under existing courses. Prerequisite: consent of Department.

**ART 539 Special Projects in Drawing: Advanced**

★6 (*fi 12*) (two term, 0-6L-0). Normally offered in Spring/Summer. Prerequisites: ART 439, or ART 440 and 441, and consent of Department.

**L ART 540 Drawing: Advanced Studies**

★3 (*fi 6*) (first term, 0-6L-0). Prerequisite: ART 439, or ART 440 and 441. Note: Restricted to BFA and BDesign students.

**L ART 541 Drawing: Advanced Studies**

★3 (*fi 6*) (second term, 0-6L-0). Prerequisite: ART 540. Note: Restricted to BFA and BDesign students. Not open to students with credit in ART 540 (★6) offered before 1995/96.

**L ART 560 Sculpture: Advanced Studies VI**

★3 (*fi 6*) (second term, 0-6L-0). Further advanced studies in sculpture. Pre or corequisites: ART 567 and 568 and/or consent of the Department. Note: Not open to students with credit in ART 564 (★6).

**L ART 565 Sculpture: Advanced Studies I**

★3 (*fi 6*) (first term, 0-6L-0). Advanced studies in sculpture. Prerequisites: ART

465 and 466 and consent of the Department. Note: Not open to students with credit in ART 562 (★6).

**L ART 566 Sculpture: Advanced Studies II**

★3 (*fi 6*) (either term, 0-6L-0). Advanced studies in sculpture. Prerequisites: ART 565 and consent of the Department. Note: Not open to students with credit in ART 562 (★6).

**L ART 567 Sculpture: Advanced Studies III**

★3 (*fi 6*) (first term, 0-6L-0). Further advanced studies in sculpture. Pre or corequisites: ART 565 and 566 and/or consent of the Department. Note: Not open to students with credit in ART 563 (★6).

**L ART 568 Sculpture: Advanced Studies IV**

★3 (*fi 6*) (second term, 0-6L-0). Further advanced studies in sculpture. Pre or corequisites: ART 565 and 566 and/or consent of the Department. Note: Not open to students with credit in ART 563 (★6).

**L ART 569 Sculpture: Advanced Studies V**

★3 (*fi 6*) (first term, 0-6L-0). Further advanced studies in sculpture. Pre or corequisites: ART 567 and 568 and/or consent of the Department. Note: Not open to students with credit in ART 564 (★6).

**Graduate Courses****ART 612 Painting: Concepts, Analysis, and Criticism**

★6 (*fi 12*) (either term, 0-18L-0).

**ART 613 Painting: Development of Concepts, Analysis, and Criticism**

★6 (*fi 12*) (either term, 0-18L-0).

**ART 622 Printmaking: Concepts, Analysis, and Criticism**

★6 (*fi 12*) (either term, 0-18L-0).

**ART 623 Printmaking: Development of Concepts, Analysis and Criticism**

★6 (*fi 12*) (either term, 0-18L-0).

**ART 630 Seminar in Related Disciplines**

★3 (*fi 6*) (either term, 0-3s-0).

**ART 640 Drawing/Intermedia: Concepts, Analysis and Criticism**

★6 (*fi 12*) (either term, 0-18L-0).

**ART 641 Drawing/Intermedia: Development of Concepts, Analysis and Criticism**

★6 (*fi 12*) (either term, 0-18L-0).

**ART 662 Sculpture: Concepts, Analysis, and Criticism**

★6 (*fi 12*) (either term, 0-18L-0).

**ART 663 Sculpture: Development of Concepts, Analysis, and Criticism**

★6 (*fi 12*) (either term, 0-18L-0).

**231.18 Art dramatique, ADRAM**

Faculté Saint-Jean

**Cours de 1er cycle****O ADRAM 101 Introduction à l'art théâtral**

★3 (*fi 6*) (l'un ou l'autre semestre, 2-0-2). Les origines et le développement de l'art théâtral, notions de base sur la production d'un spectacle de théâtre: de la conception à la réalisation. Analyses critiques de pièces auxquelles les étudiants assistent.

**O ADRAM 103 Les procédés dramatiques**

★3 (*fi 6*) (l'un ou l'autre semestre, 2-0-2). Approche pratique et théorique au développement des ressources humaines par l'art dramatique. Introduction au jeu et à la forme théâtrale, avec insistance sur le processus de création, la stimulation des capacités de communiquer et de s'exprimer, l'imagination et la spontanéité.

**O ADRAM 201 Survol historique du théâtre universel**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Styles et formes du spectacle théâtral et leur relation changeante entre l'espace de jeu et le public, à partir du théâtre grec et romain jusqu'à nos jours. Oeuvres majeures, artistes et artisans du théâtre qui ont aidé au développement du langage théâtral tel que nous le connaissons aujourd'hui. Préalables: ★3 en ADRAM ou l'équivalent.

**ADRAM 247 Communication orale**

★3 (*fi 6*) (l'un ou l'autre semestre, 0-6L-0). Exercices pour améliorer la voie et la diction; exploration des techniques de base de la communication orale et interprétation de diverses formes littéraires; développement de l'expression spontanée du langage.

**O ADRAM 249 Créativité et jeu dramatique**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). La mise en évidence des possibilités créatrices du dialogue et de la nécessité de faire découvrir, par le jeu dramatique, le fond commun et permanent de la langue parlée et de la langue écrite. Pratique



de la préparation et de la mise en marche des dramatisations, afin d'explorer la création des diverses formes dramatiques. Note : Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en FRANC 249.

#### ADRAM 284 Travail théâtral I

★6 (fi 6) (aux deux semestres, variable). Étude du jeu scénique, y compris l'analyse de textes et la création de personnages, dans le cadre d'une production théâtrale. Préalable: un des cours suivants - ADRAM 101, 103, 201 (ou l'équivalent).

#### O ADRAM 302 Théâtres francophones du Canada

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Perspectives contemporaines sur l'évolution du théâtre francophone au Canada. Étude des oeuvres qui ont marqué son histoire et des fonctions de la langue dans les répertoires dramatiques québécois et franco-canadiens. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FRANC 302. Préalables: ★3 de niveau 200 parmi FRANC, CAFR, ADRAM, ou l'équivalent.

#### ADRAM 310 Lecture à voix haute

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Techniques de lecture à voix haute, exploration des ressources corporelles, vocales, musicales, visuelles et spatiales pour la lecture devant public. Survol historique de la lecture, interprétation de textes divers et procédés de mise en lecture publique. Ce cours n'est pas accessible aux étudiants ayant suivi FRANC 310. Préalables : ★6 de niveau 200 parmi FRANC, CA FR, ADRAM ou l'équivalent.

#### ADRAM 350 Production vocale

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Exploration de la voix parlée et de la voix chantée. Éléments théoriques (physiologie et acoustique vocale) et pratiques (exercices d'élocution, exposé oral, lecture à voix haute, chant) de la production vocale. Le projet final prendra la forme d'une présentation orale pouvant inclure chant, poésie, lecture, exposé ou improvisation et mettra l'accent sur la production vocale. Ce cours n'est pas accessible aux étudiants ayant suivi MUSIQ 350. Préalables : ★3 en MUSIQ X24, MUSIQ X40 ou ADRAM, ou l'équivalent avec approbation du professeur.

#### O ADRAM 400 Choix de sujet

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Préalables : ★3 de niveau 300 ou 400 parmi FRANC, CAFR, ADRAM ou l'équivalent.

#### ADRAM 403 Théâtres francophones contemporains

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Études d'oeuvres dramatiques et de mouvements esthétiques appartenant à divers répertoires francophones contemporains. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en FRANC 403 et ADRAM/Franc 303 Préalables : 6★ de niveau 300 parmi FRANC, CAFR, ADRAM, ETCAN 330 et 332 ou l'équivalent.

#### O ADRAM 410 Traduction du théâtre et de la littérature au Canada

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Initiation à la traduction théâtrale. Étude des répertoires traduits d'une langue officielle à l'autre au Canada. Préalables : ★6 de niveau 300 ou 400 parmi FRANC, CAFR, LINGQ ou ADRAM, ou l'équivalent. Note : Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en FRANC 410.

#### ADRAM 484 Création

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Théorie et pratique du processus créatif dans l'écriture; introduction aux procédés discursifs de la poésie, du roman et de la pièce de théâtre. Préalable(s): FRANC 235 et ★3 de littérature de niveau 300. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en FRANC 484.

## 231.19 Art History, ART H

Department of Art and Design  
Faculty of Arts

**Note:** Because presence at lectures and seminars, participation in classroom discussion, and the completion of assignments are important components of most courses, students serve their best interest by regular attendance.

This particularly applies to seminars in the History of Art and Design, and Visual Culture where attendance is a factor in grading.

### Undergraduate Courses

#### L ART H 101 History of Art, Design, and Visual Culture I

★3 (fi 6) (either term, 3-0-0). Introduction to Western Art, Design and Visual Culture to the end of the 14th century.

#### L ART H 102 History of Art, Design and Visual Culture II

★3 (fi 6) (either term, 3-0-0). Introduction to Western Art, Design and Visual Culture from the 15th century to the present.

#### L ART H 202 Survey of Renaissance Art

★3 (fi 6) (either term, 3-0-0). History of visual art and culture in the 15th and 16th centuries. Not open to students with credit in ART H 252.

#### L ART H 203 Survey of 17th Century Art

★3 (fi 6) (either term, 3-0-0). History of the visual arts and culture in the 17th century. Not open to students with credit in ART H 253.

#### L ART H 205 Survey of 18th and Early 19th Century Art

★3 (fi 6) (either term, 3-0-0). History of the visual arts of the 18th and first half of the 19th century in Europe.

#### L ART H 206 Survey of 20th-Century Art I

★3 (fi 6) (either term, 3-0-0). History of the visual arts up to World War II in Europe and North America.

#### L ART H 207 Survey of Early Canadian Art

★3 (fi 6) (either term, 3-0-0). History of the visual arts from the 17th century to the end of the 19th century in Canada.

#### L ART H 209 Survey of the History of Design

★3 (fi 6) (either term, 3-0-0). Introduction to the development of design since the Industrial Revolution.

#### L ART H 210 Survey of the History of Photography

★3 (fi 6) (either term, 3-0-0). A study of photography from its invention in the 19th century to its impact in the 20th century.

#### L ART H 212 Survey of Asian Art

★3 (fi 6) (either term, 3-0-0). History of art and visual culture in Asia.

#### L ART H 249 Visual Culture and Advertising

★3 (fi 6) (either term, 3-0-0). The history of visual advertising practices from the late 19th century to the present.

#### L ART H 251 Survey of Romanesque and Gothic Art

★3 (fi 6) (either term, 3-0-0). History of the visual arts in Europe from the 11th to the 14th century.

#### L ART H 255 Survey of Art from the Second Half of the 19th Century

★3 (fi 6) (either term, 3-0-0). History of the visual arts of the second half of the 19th century in Europe.

#### L ART H 256 Survey of 20th-Century Art II

★3 (fi 6) (either term, 3-0-0). History of the visual arts of the 20th century from World War II to the present, in Europe and North America.

#### L ART H 257 Survey of 20th-Century Canadian Art

★3 (fi 6) (either term, 3-0-0). History of the visual arts of the 20th century in Canada.

#### L ART H 301 Geographies of Art, Design, and Visual Culture

★3 (fi 6) (either term, 3-0-0). The history of art, design and visual culture of a particular geographic location (e.g. nation, city, region, continent). Prerequisite: consent of Department. Note: Students are required to have successfully completed two 200-level ART H courses with a minimum grade of B-.

#### ART H 302 Vision and Visuality

★3 (fi 6) (either term, 3-0-0). Theories and practices of vision and visuality as they apply to the nature of perception, the relationship between looking, and the body and the politics of seeing. Prerequisite: consent of Department. Note: Students are required to have successfully completed two 200-level ART H courses with a minimum grade of B-.

#### ART H 304 Issues of Representation in Art, Design and Visual Culture

★3 (fi 6) (either term, 3-0-0). Representation of gender, race, class and/or sexuality from both historical and theoretical perspectives. Prerequisite: consent of Department. Note: Students are required to have successfully completed two 200-level ART H courses with a minimum grade of B-.

#### L ART H 306 Modernism and Modernity

★3 (fi 6) (either term, 3-0-0). Aspects of the modern as it applies to the artistic practices of the nineteenth and twentieth centuries. Prerequisite: consent of Department. Note: Students are required to have successfully completed two 200-level ART H courses with a minimum grade of B-.

#### ART H 307 Print Culture and Related Practices

★3 (fi 6) (either term, 3-0-0). Aspects of print culture selected from the early Modern period to the present. Prerequisite: consent of Department. Note: Students are required to have successfully completed two 200-level ART H courses with a minimum grade of B-.

#### ART H 308 Art and Religion

★3 (fi 6) (either term, 3-0-0). Intersections of art and religion across time and cultures. Prerequisite: consent of Department. Note: Students are required to have successfully completed two 200-level ART H courses with a minimum grade of B-.

#### L ART H 309 Design Theory and History

★3 (fi 6) (either term, 3-0-0). Historical and/or contemporary issues in design practice and theory. Prerequisite: consent of Department. Note: Students are required to have successfully completed two 200-level ART H courses with a minimum grade of B-.

#### ART H 311 Issues in the History of Art, Design and Visual Culture

★3 (fi 6) (either term, 3-0-0). Students are expected to have successfully completed two 200-level ART H courses with a minimum grade of B-. Prerequisite: consent of Department. Variable content course which may be repeated if topic(s) vary.

#### L ART H 330 Art and Institutions

★3 (fi 6) (either term, 3-0-0). The relationship between objects and their modes of

interpretation, circulation and display (e.g. museums, academies, exhibitions, etc.)  
Prerequisite: consent of Department. Note: Students are required to have successfully completed two 200-level ART H courses with a minimum grade of B-.

#### **ART H 356 Issues in Contemporary Art**

★3 (fi 6) (either term, 3-0-0). Recent issues in the practice and theory of contemporary art. Prerequisite: consent of Department. Note: Students are required to have successfully completed two 200-level ART H courses with a minimum grade of B-.

#### **ART H 400 Topics in Theory and Criticism**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

#### **ART H 405 Topics in Art from the 18th and the First Half of the 19th Century**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Instructor. Note: Students are required to have successfully completed one 300-level ART H course with a minimum grade of B.

#### **ART H 406 Topics in Art from the Beginning of the 20th Century**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Instructor. Note: Students are required to have successfully completed one 300-level ART H course with a minimum grade of B.

#### **ART H 409 Topics in the History of Design**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Instructor. Note: Students are required to have successfully completed one 300-level ART H course with a minimum grade of B.

#### **ART H 410 Topics in the History of Photography and Related Aspects of Representation**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Instructor. Note: Students are required to have successfully completed one 300-level ART H course with a minimum grade of B.

#### **ART H 411 Special Topics in Art History**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

#### **ART H 412 Topics in Asian Art**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: Consent of Instructor. Note: Students are required to have successfully completed one 300-level ART H course with a minimum grade of B.

#### **ART H 418 Special Subject, Fourth-Year Honors**

★6 (fi 12) (two term, 0-3s-0). Preparation of the Honors essay, required in the fourth year of the Honors Program.

#### **ART H 430 Topics in Museum Studies in Visual and Material Culture I**

★3 (fi 6) (either term, 0-3s-0). Theoretical and practical aspects of museology. Prerequisite: consent of Department.

#### **ART H 431 Topics in Museum Studies in Visual and Material Culture II**

★3 (fi 6) (either term, 0-3s-0). Contemporary issues in museology. Prerequisite: consent of Department.

#### **ART H 455 Topics in Art from the Second Half of the 19th Century**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Instructor. Note: Students are required to have successfully completed one 300-level ART H course with a minimum grade of B.

#### **ART H 456 Topics in Art from the Second Half of the 20th Century**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Instructor. Note: Students are required to have successfully completed one 300-level ART H course with a minimum grade of B.

#### **ART H 457 Topics in 20th-Century Canadian Art**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Instructor. Note: Students are required to have successfully completed one 300-level ART H course with a minimum grade of B.

## Graduate Courses

#### **ART H 505 Advanced Studies in Art from the First Half of the 19th Century**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

#### **ART H 506 Advanced Studies in Art from the First Half of the 20th Century**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

#### **ART H 509 Advanced Studies in the History of Design**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

#### **ART H 510 Topics in the History of Photography and Related Aspects of Representation**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

#### **ART H 511 Special Topics in Art History**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

#### **ART H 512 Topics in Asian Art**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: Consent of Department.

The most current Course Listing is available on Bear Tracks.

#### **ART H 555 Advanced Studies in Art from the Second Half of the 19th Century**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

#### **ART H 556 Advanced Studies in Art from the Second Half of the 20th Century**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

#### **ART H 557 Advanced Studies in Canadian Art in the 20th Century**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

#### **ART H 560 Advanced Studies in Theories of Museology**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

#### **ART H 561 Advanced Studies in Theories of Exhibition**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

#### **ART H 600 Historiography and Methodology**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

#### **ART H 611 Special Topics in Art History**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

## 231.20 Astronomy, ASTRO

Department of Physics  
Faculty of Science

### Undergraduate Courses

#### **ASTRO 120 Astronomy of the Solar System**

★3 (fi 6) (either term, 3-0-0). The development of astronomy and astronomical techniques, including results obtained from the latest orbiting observatories. The origin, evolution and nature of the Earth, the other planets and non-planetary bodies will be discussed. Viewing experience will be available using the campus observatory. Prerequisites: Pure Mathematics 30 or Mathematics 30-1 and Physics 30.

#### **ASTRO 122 Astronomy of Stars and Galaxies**

★3 (fi 6) (either term, 3-0-0). The development of our understanding of the universe, including current models of stellar evolution and cosmology. Emphasis on understanding the physical processes underlying astronomical phenomena. Viewing experience will be available using the campus observatory. Prerequisites: Pure Mathematics 30 or Mathematics 30-1 and Physics 30.

#### **ASTRO 320 Stellar Astrophysics I**

★3 (fi 6) (either term, 3-0-0). Application of physics to stellar formation and stellar evolution; theoretical models and observational comparisons of main sequence stars, white dwarf stars, neutron stars, supernovae, black holes; binary star systems, stellar atmospheres and stellar spectra. Prerequisites: MATH 115 or 118, and PHYS 126 or 146. Pre or corequisite: any 200-level PHYS course. SCI 100 may be used in lieu of MATH 115 and PHYS 126 or 146. Some additional knowledge of astronomy (ASTRO 120 and/or 122) is advantageous.

#### **ASTRO 322 Galactic and Extragalactic Astrophysics**

★3 (fi 6) (either term, 3-0-0). The interstellar medium and interstellar reddening; galactic structure; kinematics and dynamics of stars in galaxies; quasars; introduction of cosmology. Prerequisites: MATH 115 or 118, and PHYS 126 or 146, and PHYS 208 or 271. SCI 100 may be used in lieu of MATH 115 and PHYS 126 or 146. Previous knowledge of astronomy is advantageous. ASTRO 320 is strongly recommended.

#### **ASTRO 429 Upper Atmosphere and Space Physics**

★3 (fi 6) (either term, 3-0-0). Basic space plasma phenomena: the Earth's plasma and field environment; the solar cycle; generation of the solar wind; the interplanetary plasma and field environment; the solar-terrestrial interaction; magnetospheric substorms; the aurora borealis; magnetosphere-ionosphere interactions; effects of magnetospheric storms on man-made systems; use of natural electromagnetic fields for geophysical exploration. Pre- or corequisite: PHYS 381.

#### **ASTRO 430 Physical Cosmology**

★3 (fi 6) (either term, 3-0-0). Observational cosmology; geometry and matter content of the Universe; physical processes in the early stages of the Universe; inflation, Big Bang nucleosynthesis and the cosmic microwave background radiation; cosmological aspects of galaxy formation and the growth of large-scale structure. Prerequisites: PHYS 310, 458, MATH 334.

#### **ASTRO 465 Stellar Astrophysics II**

★3 (fi 6) (either term, 3-0-0). Stellar interiors and nuclear transformations; energy transport; model stars; variable stars; stellar evolution. Prerequisites: PHYS 310, 271, ASTRO 320, MATH 334. Note: Credit may be obtained for only one of PHYS 465 or ASTRO 465.

## 231.21 Augustana Faculty - Accounting, AUACC

Department of Social Sciences  
Augustana Faculty

<https://www.beartracks.ualberta.ca>

## Undergraduate Courses

### AUACC 311 Introductory Accounting

★3 (fi 6) (either term, 3-0-1.5). Postulates, principles, the accounting cycle, capital and income measurement, financial statement preparation and analysis; emphasis on reporting to shareholders, creditors, and other external decision makers. Prerequisites: AUACO 101, 102, and basic familiarity with microcomputer applications.

### AUACC 322 Managerial Accounting

★3 (fi 6) (either term, 3-0-0). Designed to help managers assess needed information to carry out three essential functions in an organization: planning operations, controlling activities, and making decisions. The emphasis of this course is on cost behaviors, various product costing methods, cost-volume-profit relationships, budgeting and control through standard costs, and other quantitative techniques used by management. Prerequisite: AUACC 311.

## 231.22 Augustana Faculty - Art, AUART

Department of Fine Arts  
Augustana Faculty

## Undergraduate Courses

### AUART 101 Introduction to the History of Art I

★3 (fi 6) (either term, 3-0-0). Introduction to the history of art from the Prehistoric Age to the end of the Middle Ages.

### AUART 102 Introduction to the History of Art II

★3 (fi 6) (either term, 3-0-0). Introduction to the history of art from the Renaissance to the twentieth century.

### AUART 111 Studio Foundation I

★3 (fi 6) (either term, 0-6L-0). Art-making is explored with basic techniques in drawing and color media. The visual language of perception and expression is introduced using principles of composition. Aesthetic and psychological principles of visual organization are applied to elements of line, shape, colour, and texture.

### AUART 112 Studio Foundation II - 3-D and Colour Theory

★3 (fi 6) (either term, 0-6L-0). Further exploration of art-making in two and three dimensions. Visual structure is investigated expressively and technically in sculpture processes and paint media. Development of personal creativity and a basis for compositional analysis are included. Prerequisite: AUART 111, or Art 30 equivalence with consent of the instructor (based on portfolio submission). Note: Credit may be obtained for only one of AUART 112 and 113.

### AUART 113 Studio Foundation II - 3-D and Digital Art

★3 (fi 6) (either term, 0-6L-0). Dimensional art and digital art for beginners. Ideas for three-dimensional art are explored. Basic computer imaging techniques such as photo-editing in bitmaps, drawing with vectors, and digital painting are introduced. Credit may be obtained for only one of AUART 112 and 113.

### AUART 213 Computer Imaging

★3 (fi 6) (either term, 2-4L-0). Intermediate course in composition and two-dimensional design problems using digital media. Colour theory and Gestalt principles are applied to techniques in photo-editing, vector drawing, and digital painting. Prerequisite: AUART 113.

### AUART 215 Sculpture I

★3 (fi 6) (either term, 0-6L-0). Introduction to principles of composition and practice in 3-dimensional art. Historical and contemporary issues are explored. Prerequisite: Second year standing.

### AUART 221 Nineteenth-Century Art History

★3 (fi 6) (either term, 3-0-0). Development of modern art in Europe during the nineteenth century with emphasis on major movements, concepts, and innovators.

### AUART 222 Art of the Twentieth Century

★3 (fi 6) (either term, 3-0-0). Introduction to the practices and concepts of art during the twentieth century. Includes an introduction to a range of art and architecture, as well as a variety of critical and theoretical interpretations of art. Central focus is on the development of a modernist mainstream during this century and its relation to the ideas of post-modernism.

### AUART 223 Canadian Art

★3 (fi 6) (either term, 3-0-0). Survey of the visual arts in Canada, from the indigenous beginnings to the present, with emphasis on the twentieth century.

### AUART 224 Art and Its Histories

★3 (fi 6) (either term, 3-0-0). Study of works, movements, theories and institutions of art with an emphasis on contemporary art and recent approaches to the study and analysis of art works. It examines painting, sculpture, architecture, photography, graphic and applied art.

### AUART 228 Art Studies and Information Literacy

★1 (fi 2) (either term, 1-0-0). Introduction to library research skills in the discipline

of Art studies. Prerequisite: Second-year standing in an Art degree program. Corequisite: Any senior course in Art that requires library research. Notes: The corequisite must be taken concurrently. Credit may be received for only one of AUART 228, AUHIS 285, AUPHI 228, AUREL 228.

### AUART 231 Drawing I

★3 (fi 6) (either term, 0-6L-0). Introductory course that develops basic skills of perception and recording as they apply to the practice of drawing. Historical and contemporary practices are explored primarily on the basis of direct observation of still life, landscape, and architecture. Issues in composition, expression, critical analysis, and technique using monochromatic media are included. Prerequisite: Second year standing, or Art 30, or consent of the instructor (based on portfolio submission).

### AUART 232 Drawing II

★3 (fi 6) (either term, 0-6L-0). Further exploration of drawing practice with the application of observational and conceptual skills to issues of expression and composition. Figure drawing, including anatomy, perceptual considerations, and the expressive potential of the human figure, is introduced. The use of colour media, the development of a personal aesthetic response, as well as critical analysis are included. Prerequisite: AUART 231 or consent of the instructor (based on portfolio submission).

### AUART 260 Selected Topics in Art History

★3 (fi 6) (either term, 0-3s-0). Selected topics in Art History possibly, but not necessarily, linked to a course that would later visit sites of art and visual culture. Note: Credit may be obtained for only one of AUART 260 or AUCLA 193, 293.

### AUART 261 Selected Topics in Art History

★3 (fi 6) (either term, 0-3s-0). Selected topics in Art History possibly, but not necessarily, linked to a course that would later visit sites of art and visual culture.

### AUART 262 Selected Topics in Art History

★3 (fi 6) (either term, 0-3s-0). Selected topics in Art History possibly, but not necessarily, linked to a course that would later visit sites of art and visual culture.

### AUART 263 Selected Topics in Art History

★3 (fi 6) (either term, 0-3s-0). Selected topics in Art History possibly, but not necessarily, linked to a course that would later visit sites of art and visual culture.

### AUART 264 Selected Topics in Art History

★3 (fi 6) (either term, 0-3s-0). Selected topics in Art History possibly, but not necessarily, linked to a course that would later visit sites of art and visual culture.

### AUART 265 Selected Topics in Art History Tour

★3 (fi 6) (either term, variable in 3 weeks). Tour course following the selected topics course to which it is linked. The tour visits art sites discussed in that course. Prerequisite: The appropriate linked course from the AUART 260 - 264 series. Note: Credit may be obtained for only one of AUART 265 or AUCLA 194, 294.

### AUART 266 Selected Topics in Art History Tour

★3 (fi 6) (either term, variable in 3 weeks). Tour course following the selected topics course to which it is linked. The tour visits art sites discussed in that course. Prerequisite: The appropriate linked course from the AUART 260 - 264 series.

### AUART 267 Selected Topics in Art History Tour

★3 (fi 6) (either term, variable in 3 weeks). Tour course following the selected topics course to which it is linked. The tour visits art sites discussed in that course. Prerequisite: The appropriate linked course from the AUART 260 - 264 series.

### AUART 268 Selected Topics in Art History Tour

★3 (fi 6) (either term, variable in 3 weeks). Tour course following the selected topics course to which it is linked. The tour visits art sites discussed in that course. Prerequisite: The appropriate linked course from the AUART 260 - 264 series.

### AUART 269 Selected Topics in Art History Tour

★3 (fi 6) (either term, variable in 3 weeks). Tour course following the selected topics course to which it is linked. The tour visits art sites discussed in that course. Prerequisite: The appropriate linked course from the AUART 260 - 264 series.

### AUART 271 Painting I

★3 (fi 6) (either term, 0-6L-0). Painting from the ground up. The course introduces painting technique and colour usage in acrylic and/or oil media. Perceptual and conceptual problems are based on historical and contemporary practices with an emphasis on personal creativity. Critical analysis of art is a component. Prerequisites: AUART 231, or AUART 111 and basic drawing skills. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

### AUART 272 Painting II

★3 (fi 6) (either term, 0-6L-0). Further exploration of painting practice using oil and acrylic painting techniques. Critical analysis is included. Varieties of conceptual



contexts and individual expressive directions are investigated. Prerequisite: AUART 271 or consent of the instructor (based on portfolio submission). Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **AUART 287 Topics in Late Seventeenth- and Eighteenth-Century Art**

★3 (fi 6) (either term, 3-0-0). Consideration of various topics in seventeenth and eighteenth century European art. Its focus is on the study of themes, ideas and methodologies pertaining to the visual culture of the period, rather than a chronological survey.

#### **AUART 289 Studies in Visual Culture**

★3 (fi 6) (either term, 0-3s-0). Selected topics in the history of visual culture that are organized thematically rather than by period, nationality or style. Prerequisite: Second-year standing.

#### **AUART 298 Selected Topics in Art Studio**

★3 (fi 6) (either term, 0-6L-0). Selected topics in art studio practice that are theme or media based. Prerequisite: Second year standing. Notes: AUART 298 does not count towards any major or minor in Art.

#### **AUART 299 Selected Topics in Art Studio**

★3 (fi 6) (either term, 0-6L-0). Selected topics in art studio practice that are theme or media specific. Prerequisite: Second year standing. Notes: AUART 299 does not count towards any major or minor in Art.

#### **AUART 331 Drawing III**

★3 (fi 6) (either term, 0-6L-0). Intermediate drawing further develops techniques and concepts of drawing with a focus on contemporary practices leading to self-initiated projects. Prerequisite: AUART 231.

#### **AUART 365 Aesthetics and Visual Culture**

★3 (fi 6) (either term, 3-0-0). Considerations of theoretical issues related to visual arts, broadly understood B painting, television, video, film, advertising, and photography. Classical theories of nature of the visual experience, as well as modern and postmodern theories and critiques. Note: Credit may be obtained for only one of AUART 365 and AUPHI 365.

#### **AUART 366 Representations of Place and Space**

★3 (fi 6) (either term, 3-0-0). Investigation of concepts and representations in art, architecture, literature and philosophy, of place and space from the Renaissance to the present. Prerequisite: None, but a course in Art history, Philosophy, Geography, or Canadian literature would be helpful. Note: Credit may be obtained for only one of AUART 366 and AUPHI 366.

#### **AUART 367 Critical Discourse and the Fine Arts**

★3 (fi 6) (either term, 0-3s-0). Introduction to theory and the fine arts. A critical study of historical and contemporary issues in the fine arts with an emphasis on themes common to the disciplines of drama, music and the visual arts as cultural processes. Discussions of various theoretical positions including critical and cultural theory, aesthetic theory, disciplinary history and a history of criticism. Prerequisite: Third-year standing. Note: Credit may be obtained for only one of AUART 367, 467, AUDRA 367, 467, AUMUS 367, 467.

#### **AUART 371 Painting III**

★3 (fi 6) (either term, 0-6L-0). Intermediate painting further develops techniques and concepts of painting with a focus on contemporary practices leading to self-initiated projects. Prerequisite: AUART 272.

#### **AUART 380 Directed Reading in Art History**

★3 (fi 6) (either term, 1-0-0). Individual study project for the advanced art history student. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

#### **AUART 381 Selected Topics in Art History**

★3 (fi 6) (either term, 0-3s-0). Selected topics in art history and visual culture. Prerequisite: Any 200-level Art history course or consent of the instructor.

#### **AUART 382 Selected Topics in Art History**

★3 (fi 6) (either term, 0-3s-0). Selected topics in art history and visual culture. Prerequisite: Any 200-level Art history course or consent of the instructor.

#### **AUART 383 Selected Topics in Art History**

★3 (fi 6) (either term, 0-3s-0). Selected topics in art history and visual culture. Prerequisite: Any 200-level Art history course or consent of the instructor.

#### **AUART 384 Selected Topics in Art History**

★3 (fi 6) (either term, 0-3s-0). Selected topics in art history and visual culture. Prerequisite: Any 200-level Art history course or consent of the instructor.

#### **AUART 385 Selected Topics in Art History**

★3 (fi 6) (either term, 0-3s-0). Selected topics in art history and visual culture. Prerequisite: Any 200-level Art history course or consent of the instructor.

#### **AUART 411 Visual Explorations**

★3 (fi 6) (either term, 0-6s-0). Advanced studies in a studio discipline with individualized programs designed in collaboration with the instructor. Direction is guided by issues in contemporary practice and thought. Prerequisites: AUART 331 and one of 215, 371.

#### **AUART 467 Critical Discourse and the Fine Arts**

★3 (fi 6) (either term, 0-3s-0). Introduction to theory and the fine arts. A critical study of historical and contemporary issues in the fine arts with an emphasis on themes common to the disciplines of drama, music and the visual arts as cultural processes. Discussions of various theoretical positions including critical and cultural theory, aesthetic theory, disciplinary history and a history of criticism. Prerequisite: Third-year standing. Note: Credit may be obtained for only one of AUART 367, 467, AUDRA 367, 467, AUMUS 367, 467.

#### **AUART 480 Directed Reading in Art History**

★3 (fi 6) (either term, 1-0-0). Individual study project for the highly advanced art history student. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

#### **AUART 490 Directed Project in Visual Explorations**

★3 (fi 6) (either term, 0-1L-0). Individual study course for the highly advanced studio art student. A selected theme in two- or three-dimensional expression is explored intensively. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

## 231.23 Augustana Faculty - Biology, AUBIO

Department of Science  
Augustana Faculty

### Undergraduate Courses

#### **AUBIO 108 Introduction to Marine Biology**

★3 (fi 6) (second term, 3-0-3/2). Introduction to the diversity of marine ecosystems and the adaptations of marine organisms to their environment. Notes: The course does not count toward the major, concentration, or minor in Biology. The course is available only as part of the Augustana-in-Cuba Program.

#### **AUBIO 110 Evolution of Biological Diversity**

★3 (fi 6) (either term, 3-3L/2-3/2). Examination of the evolutionary mechanisms and history that have produced the earth's biodiversity. Prerequisite: Biology 30.

#### **AUBIO 130 Cell Biology**

★3 (fi 6) (either term, 3-3L/2-3/2). Study of the ultrastructure and function of plant and animal cells. Topics include membrane models, cytoplasmic organelles, the cell cycle, and nucleocytoplasmic interactions. Dynamic processes at the cellular level, such as cellular respiration, photosynthesis, and motility, and function of plant, animal, and prokaryote cells, are also examined. Prerequisites: Biology 30 or AUBIO 093, and Chemistry 30.

#### **AUBIO 210 Biological Science and Information Literacy**

★1 (fi 2) (either term, 1-0-0). Introduction to library research skills in the biological sciences. Prerequisite: Second-year standing in a Biology or Environmental degree program. Corequisite: Any senior course in Biology that requires library research. Notes: The corequisite must be taken concurrently. Credit may be obtained for only one of AUBIO 210, AUCHE 210, AUENV 210 and AUGEO 210.

#### **AUBIO 222 Plant Diversity**

★3 (fi 6) (either term, 3-0-3). Comparative survey of the morphology, life cycles, and evolutionary features of algae, fungi, and non-vascular and vascular plants. Taxonomic and environmental considerations are also presented. Prerequisite: AUBIO 110.

#### **AUBIO 230 Molecular Cell Biology**

★3 (fi 6) (either term, 3-0-0). The composition, structure and function of cell membranes including membrane transport, cell signalling and cell-cell interactions. Protein sorting and cytoskeletal function is integrated with their membrane interactions. The social context of cells is also considered. Prerequisite: AUBIO 130. Corequisite: AUCHE 250.

#### **AUBIO 253 Principles of Ecology**

★3 (fi 6) (either term, 3-0-3). Study of the interactions between organisms and their environment in the context of populations, communities, ecosystems, and biomes. Prerequisite: AUBIO 110.

#### **AUBIO 260 Principles of Genetics**

★3 (fi 6) (either term, 3-0-3). Mendelian inheritance and its cytological features including the molecular and cellular basis for the transmission of hereditary characteristics. Topics that are emphasized include microbial genetics, cytoplasmic inheritance, linkage and genetic mapping, DNA as genetic material, gene action, and the genetic code. Prerequisite: AUBIO 130.

#### **AUBIO 274 Microbiology**

★3 (fi 6) (either term, 3-0-3). Introduction to the prokaryotic and eukaryotic members of the microbial world. Microbiological diversity will be examined by comparing cellular morphology, structure and metabolism. Topics include how to grow and study microbes, classification approaches and problems, control of microbial growth, microbial ecology and industrial applications of microorganisms and their products. Prerequisite: AUBIO 130.



**AUBIO 294 Survey of the Invertebrates**

★3 (*fi 6*) (either term, 3-0-3). Functional anatomy and life cycles of the major invertebrate taxa. Prerequisite: AUBIO 110.

**AUBIO 295 The Vertebrates**

★3 (*fi 6*) (either term, 3-0-3). Study of the structure, function, and diversity of vertebrates. Prerequisite: AUBIO 110.

**AUBIO 318 Directed Reading**

★3 (*fi 6*) (either term, 1-0-0). Supervised library research project. Prerequisites: Third-year standing, ★6 in Biology at the 200 level. Notes: Admission to the course normally requires a minimum GPA of 3.0 in Biology. An "Application for Individual Study" must be completed and approved before registration in the course.

**AUBIO 320 Plant Autecology**

★3 (*fi 6*) (either term, 3-0-0). Study of plant species' population dynamics; interrelationships with biotic and abiotic components of the environment and ecophysiological adaptations. Prerequisite: AUBIO 253.

**AUBIO 321 Plant Synecology**

★3 (*fi 6*) (either term, 3-0-3). Study of plant communities and their formation, maintenance, distribution, and interaction with the abiotic environment. Consideration is also given to plant succession, fire ecology, and global vegetation patterns. Prerequisite: AUBIO 253.

**AUBIO 322 Economic Botany**

★3 (*fi 6*) (either term, 3-0-0). Biological properties, geographical distribution, applications/utilization, and history of vascular and nonvascular plants economically important in agriculture, industry, and medicine. Corequisite: AUBIO 222. Note: Credit may be obtained for only one of AUBIO 322 and AUENV 322.

**AUBIO 326 Drug Plants**

★3 (*fi 6*) (either term, 3-0-0). Survey of historical and current use of important drug-producing plants. Evaluation of the chemistry and physiology of biologically active compounds from poisonous, analgesic, and hallucinogenic plants, and the current uses of such plant products. Use of plant biotechnology to develop drug-producing plants. Prerequisite: 200-level Biology course.

**AUBIO 336 Histology**

★3 (*fi 6*) (either term, 3-0-3). Systematic and sequential consideration of fundamental cytology, the normal histology of the basic tissues, and the embryological development and microscopic organization of the major mammalian organs and organ systems. Emphasis is placed on the light- and electron-microscopic features of cells and tissues with direct correlation of structure and function. Prerequisites: AUBIO 230 and 295.

**AUBIO 338 Developmental Biology**

★3 (*fi 6*) (either term, 3-0-3). Development of complex organisms. Emphasis is on the interactions between cells and their environment that determine cell survival, gene activation and deactivation; and how specific cell and tissue structures and functions are selected. Developmental processes common to plants and animals are identified. Prerequisites: AUBIO 230 and 260; one of AUBIO 222, 294 and 295; and third year standing.

**AUBIO 341 Entomology**

★3 (*fi 6*) (either term, 3-0-3). Examination of the world of insects from the point of view of major areas of entomological study including life histories, taxonomy, phylogeny, physiology, development, morphology, and behaviour. Emphasis is given to the study of insects as animals, not as pests. Prerequisite: AUBIO 294.

**AUBIO 343 Insect Ecology**

★3 (*fi 6*) (either term, 3-0-0). Relationships of insects to their environment, including the roles of insects in energy flow, biogeochemical cycling, and ecological succession. Evolutionary relationships also receive attention. Prerequisites: AUBIO 253 and 294.

**AUBIO 350 Conservation Theory and Biodiversity in Tropical Systems**

★3 (*fi 6*) (first term, 3-0-1). Introduction to the basic concepts of conservation biology. The scope of conservation biology and levels of biodiversity are explored, as are aspects of tropical ecology related to conservation. Prerequisite: One of AUBIO 253, 294, or 295, and consent of the instructor(s) based on successful completion of the selection process. Note: This course is intended to be taken in sequence with AUBIO 459 or AUENV 459. Credit may be obtained for only one of AUBIO 350, 450, AUENV 350, 450.

**AUBIO 351 Biogeography**

★3 (*fi 6*) (either term, 3-0-3). Analysis of the spatial patterns of biotic systems and species. The course examines their past and present distribution patterns in the context of biological and ecological processes and human impacts. The course employs several methods of analysis, including geographic information systems. Prerequisite: AUBIO 253. Note: Credit may be obtained for only one of AUBIO 351 and AUGEO 351.

**AUBIO 354 Freshwater Ecology and Management**

★3 (*fi 6*) (first term, 3-0-3). Introduction to the biological, chemical and physical features of freshwater ecosystems, and how they relate to ecological processes in and adjacent to aquatic systems. The course will examine the role of ecological patterns in lakes, ponds, rivers and streams, with an emphasis on freshwater systems and their management in western Canada. Prerequisite: AUBIO 253.

Notes: Credit may be obtained for only one of AUBIO 354, AUENV 354, and AUGEO 354. The course requires participation in a field trip.

**AUBIO 371 Immunology**

★3 (*fi 6*) (either term, 3-0-3). An introduction to the structure and function of the immune system. Topics will include the generation of B and T cell receptor diversity, antigens and antibodies, clonal selection and expansion, MHC restriction, self tolerance, cytokines and leukocyte trafficking. Discussion of infectious disease, vaccines, and immunity will be used to synthesize these topics into a unified conceptual framework. Prerequisites: AUBIO 230 and 260. Note: Credit may be obtained for only one of AUBIO 371 and AUBIO 471 (2008).

**AUBIO 380 Biochemistry I**

★3 (*fi 6*) (either term, 3-0-3/2). The structure and function of proteins and enzymes and the structure, function, and metabolism of carbohydrates. The structure and function of lipids, nucleic acids, and amino acids are introduced. The course focuses on how enzymes catalyze the oxidation of carbohydrates and how the cell conserves this energy in a useful chemical form. Prerequisite: AUCHE 252. Corequisite: AUBIO 230. Note: Credit may be obtained for only one of AUBIO 380 and AUCHE 380.

**AUBIO 381 Biochemistry II**

★3 (*fi 6*) (either term, 3-0-3/2). Structure, function, and metabolism of carbohydrates, lipids, amino acids, and nucleic acids at the level of the cell and organs. Prerequisites: AUBIO 380 or AUCHE 380. Note: Credit may be obtained for only one of AUBIO 381 and AUCHE 381.

**AUBIO 389 Molecular Biology of the Gene**

★3 (*fi 6*) (either term, 3-0-0). Survey of current knowledge and approaches in the area of structure, expression, and regulation of prokaryote and eukaryote genes. Topics include gene isolation and characterization, gene structure and replication, and transcription and translation processes and their regulation. Recombinant DNA technology and its applications are also introduced. Prerequisite: AUBIO 260.

**AUBIO 390 Animal Behaviour**

★3 (*fi 6*) (either term, 3-0-3). Introduction to key concepts and methods in animal behaviour. Both mechanistic and evolutionary points of view are considered. The student's understanding of scientific thinking is deepened. Topics include instinct, learning, orientation, communication, mating and territoriality, foraging, and social behaviour. Prerequisite: AUBIO 294 or 295.

**AUBIO 397 Vertebrate Physiology**

★3 (*fi 6*) (either term, 3-0-0). Review of the general concepts in animal physiology with an emphasis on structure and function and their adaptive significance to the animal in its environment. Physical, chemical, and functional aspects of animal cells and cardiovascular, respiratory, digestive, osmoregulatory, endocrine, and nervous systems are considered. Bioelectric and contractility phenomena are also included. Prerequisites: AUBIO 230 and 295.

**AUBIO 411 History and Theory of Biology**

★3 (*fi 6*) (either term, 3-0-0). Overview of historical progression in the biological sciences and their associated development in relation to prevailing philosophical, social, and cultural contexts. Prerequisites: AUBIO 260; one of AUBIO 222, 274, 275 (2008), 294, 295; ★6 of Biology at the 300 level; fourth-year standing. AUBIO 338 is strongly recommended. Note: Credit may be obtained for only one of AUBIO 411 and AUBIO 311.

**AUBIO 412 Selected Topics in Biological Science**

★3 (*fi 6*) (either term, 3-0-0). In-depth study of an advanced topic in Biology. Prerequisites: Vary according to topic; third-year standing.

**AUBIO 413 Advanced Topics in Evolutionary Ecology**

★3 (*fi 6*) (either term, 3-0-0). In-depth study of evolutionary processes in natural populations of plants and animals. Selected topics for lectures and seminars address contemporary questions about natural selection, adaptation, speciation, biogeography and the evolution of interaction among species. Prerequisites: AUBIO 253 and ★3 of AUBIO at the 300 level or a cross-listed AUENV or AUGEO equivalent.

**AUBIO 419 Directed Studies**

★3 (*fi 6*) (either term, 1-0-3). Supervised laboratory research project. Prerequisites: AUBIO 318 and consent of the instructor. Notes: Admission to the course normally requires a minimum GPA of 3.0 in Biology. An "Application for Individual Study" must be completed and approved before registration in the course.

**AUBIO 423 Directed Reading in Plant Ecology**

★3 (*fi 6*) (either term, 1-0-0). Supervised and directed readings for developing written assignments in a specific subject area of plant ecology. The course may serve as a base for a complementary independent laboratory studies course. Prerequisite: AUBIO 320 or 321. Notes: Admission to AUBIO 423 normally requires a minimum GPA of 3.0 in Biology. An "Application for Individual Study" must be completed and approved before registration in the course.

**AUBIO 430 Cell Physiology**

★3 (*fi 6*) (either term, 3-0-0). Current topics in energetics, excitable membranes, the cytoskeleton, cell dynamics, and regulation of cell function. Prerequisite: AUBIO 380 or AUCHE 380 plus one of AUBIO 327, 336, 338, 381, 389, 397, or AUCHE 381.

**AUBIO 438 Evolutionary Development Biology**

★3 (fi 6) (either term, 3-0-0). Comparative study of the developmental processes of different organisms in an attempt to determine their ancestral relationships and how developmental processes evolved. Topics include the origin and evolution of embryonic development; how modifications of development and developmental processes lead to the production of novel features; the role of developmental plasticity in evolution; the origin of biodiversity; and the developmental basis of homology. Prerequisites: AUBIO 260 and 338.

**AUBIO 448 Directed Reading in Entomology**

★3 (fi 6) (either term, 1-0-0). Investigation of advanced topics in entomology. Prerequisite: AUBIO 341 or 343. Notes: Admission to AUBIO 448 normally requires a minimum GPA of 3.0 in Biology. An "Application for Individual Study" must be completed and approved before registration in the course.

**AUBIO 459 Field Studies in Tropical Ecology and Conservation**

★3 (fi 6) (second term, 1.5-0-0 2 weeks field work). Field course that addresses problems of biodiversity and conservation in tropical environments. The student participates in field workshops, and designs and conducts his or her own field project to answer questions related to ecological and biological conservation. Prerequisite: AUBIO 350 or AUENV 350, and consent of the instructors based on successful completion of the selection process. Notes: Credit may be obtained for only one of AUBIO 459 and AUENV 459. Students who have received credit for AUBIO 359 or AUENV 359 may enrol in AUBIO 459 or AUENV 459 in a subsequent year based on successful completion of the selection process. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**AUBIO 475 Pathogenic Mechanisms of Microorganisms**

★3 (fi 6) (either term, 3-0-3). Examination of the pathogenic mechanisms used by bacteria, fungi, and protists that cause human diseases. Pathogens will be compared with a focus on the method of entry, colonization and invasion of host tissue used by various microbes and the microbial factors required to cause infection and disease. Epidemiological approaches, antimicrobials and antibiotic resistance will also be presented. Prerequisites: AUBIO 260, 274, 371. Note: Credit may be obtained for only one of AUBIO 275 (2008) and AUBIO 475.

**AUBIO 485 Selected Topics in Biochemistry**

★3 (fi 6) (either term, 3-0-0). In-depth examination of biochemistry. Prerequisites: Fourth-year standing in the Biology program; AUBIO 381 or AUCHE 381; and an additional ★3 of AUBIO at the 300-level. Note: Credit may only be obtained for one of AUBIO 485 and AUCHE 485.

**AUBIO 489 Directed Reading in Lipid Biochemistry**

★3 (fi 6) (either term, 1-0-0). Biochemistry of lipids, lipoproteins, and membranes. The course extends and deepens material covered in AUBIO 381 by examining some of the theories, experiments, and methods used to investigate lipid biochemistry. Prerequisite: AUBIO 381. Notes: It is strongly recommended that AUBIO 389 precede AUBIO 489. Admission to AUBIO 489 normally requires a minimum GPA of 3.0 in Biology. An "Application for Individual Study" must be completed and approved before registration in the course. Credit may be obtained for only one of AUBIO 489 and AUCHE 489.

**AUBIO 493 Directed Reading in Behavioural Ecology**

★3 (fi 6) (either term, 1-0-0). Advanced topics of behavioural ecology. Functional questions in animal behaviour are explored within the framework of three conceptual issues: simple optimality, game theory, and stochastic dynamic modelling. Included are the theoretical foundations and a review of empirical studies to analyze the explanatory and predictive value of the models. Prerequisite: AUBIO 390. Notes: Admission to AUBIO 493 normally requires a minimum GPA of 3.0 in Biology. An "Application for Individual Study" must be completed and approved before registration in the course.

## 231.24 Augustana Faculty - Chemistry, AUCHE

Department of Science  
Augustana Faculty

**Undergraduate Courses****AUCHE 110 General Chemistry I**

★3 (fi 6) (first term, 3-3L/2-3/2). A general introduction to chemistry. Topics include atomic structure; bonding and bonding theories; periodic trends; states of matter and intermolecular forces; and chemical kinetics. Prerequisites: Chemistry 30 and Pure Mathematics 30 or Mathematics 30-1.

**AUCHE 112 General Chemistry II**

★3 (fi 6) (second term, 3-3L/2-3/2). Continuations of AUCHE 110. Topics include thermodynamics, free energy, equilibria, acid-base chemistry, buffers, oxidation-reduction reactions, electrochemistry, and nuclear chemistry. Prerequisite: AUCHE 110.

**AUCHE 210 Chemistry Studies and Information Literacy**

★1 (fi 2) (either term, 1-0-0). Introduction to library research skills in chemistry. Prerequisite: Second-year standing in a Chemistry degree program. Corequisite: Any senior course in Chemistry that requires library research. Notes: The corequisites must be taken concurrently. Credit may be obtained for only one of AUCHE 210, AUBIO 210, AUENV 210, AUGEO 210.

**AUCHE 220 Analytical Chemistry**

★3 (fi 6) (either term, 3-0-3). Theoretical and practical aspects of chemical analysis. Topics include gravimetry, titrimetry, separations, acid-base equilibria, chromatography, and spectrophotometry. Examples emphasize the utility and limitations of analytical techniques. Prerequisite: AUCHE 112. Recommended corequisite: AUMAT 110 or 111.

**AUCHE 222 Instrumental Analysis**

★3 (fi 6) (either term, 3-0-3). Study of the theory and practice of instrumental methods of analysis. Topics include atomic absorption and emission spectroscopy, fluorometry, liquid and gas chromatography, physical separations, and electrochemical methods. Examples include the analysis of chemicals with environmental importance. Prerequisite: AUCHE 220. Recommended corequisite: AUMAT 110 or 111.

**AUCHE 230 Inorganic Chemistry I**

★3 (fi 6) (first term, 3-0-3). Electronic structure of atoms, bonding and molecular structure, ionic bonding, symmetry and point groups, introduction to spectroscopy; infrared and Raman spectroscopy, uv-visible spectroscopy; chemistry of hydrogen, boron hydrides, cyclic boron-nitrogen, phosphorus-nitrogen, and sulfur-nitrogen compounds. Prerequisite: AUCHE 112.

**AUCHE 232 Inorganic Chemistry II**

★3 (fi 6) (second term, 3-0-3). Theory and applications of organometallic chemistry, metal carbonyls, metal nitrosyls, dinitrogen complexes, transition metal organometallic compounds, synergic bonding, organometallic catalysts, fluxional molecules; descriptive chemistry of the s- and p-block elements; fullerenes. Prerequisite: AUCHE 230.

**AUCHE 250 Organic Chemistry I**

★3 (fi 6) (first term, 3-0-3). An introduction to bonding and functionality in organic compounds. Mechanistic approach to solving problems will be emphasized, with discussion of the reactions of alkanes, alkenes, alkynes, and alkyl halides. The three dimensional structure of molecules and the concept of stereochemistry will be examined. Infrared spectroscopy and Nuclear Magnetic Resonance spectroscopy will be applied in both the lecture and the lab. Prerequisite: AUCHE 110; AUCHE 112 is recommended.

**AUCHE 252 Organic Chemistry II**

★3 (fi 6) (second term, 3-0-3). Continuation of AUCHE 250, again emphasizing a mechanistic approach. The chemistry of alcohols, conjugated unsaturated systems, aromatic rings, carbonyl-containing compounds, organic reduction-oxidation reactions, and beta-dicarbonyl compounds will be discussed. Carbohydrate chemistry will be introduced as a way to explore many concepts in a biochemical context. Prerequisite: AUCHE 250.

**AUCHE 277 Introduction to Relativity and Quantum Mechanics**

★3 (fi 6) (either term, 3-0-0). Special relativity; photons and matter waves; Bohr atom model; Heisenberg Uncertainty Principle; Schrödinger equation; one-dimensional systems; hydrogen atom; spin; Pauli Exclusion Principle; many-electron atoms; molecules. Prerequisites: AUCHE 112, AUMAT 112, and AUPHY 120. Corequisite: AUMAT 211. Note: Credit may be obtained for only one of AUCHE 277, AUPHY 260.

**AUCHE 279 Physical Chemistry**

★3 (fi 6) (either term, 3-0-3). Study of the principles and concepts of physical chemistry. Topics include the laws of thermodynamics, chemical equilibrium, phase, equilibria, surface chemistry, chemical kinetics and catalysis and spectroscopy and photochemistry. Prerequisites: AUCHE 112 and AUMAT 110 or 111.

**AUCHE 320 Analytical Chemistry III**

★3 (fi 6) (either term, 3-0-0). Theory and application of nuclear magnetic resonance spectroscopy, infrared spectroscopy and mass spectrometry. Prerequisite: AUCHE 222.

**AUCHE 322 Topics in Analytical Electrochemistry**

★3 (fi 6) (either term, 3-0-0). The study of electrochemistry and electroanalytical techniques. Prerequisite: AUCHE 222.

**AUCHE 330 Transition Metal Chemistry**

★3 (fi 6) (second term, 3-0-3). Ligand field theory, molecular orbital theory, stereochemistry, magnetochemistry, applications of nuclear magnetic resonance to transition metal complexes, isomerism, reaction mechanisms, electronic spectra and ligand field calculations, descriptive chemistry, transition metals in biological systems, the lanthanides and actinides. Prerequisite: AUCHE 230.

**AUCHE 350 Organic Chemistry III**

★3 (fi 6) (either term, 3-0-3). Continuation of the foundation laid in AUCHE 250 and 252, considering in greater depth and breadth various familiar topics (e.g., reactions of carbonyl compounds), and exploring reactions (e.g., free-radical,

enantioselective, green chemistry) and techniques (e.g., use of protecting groups) and investigating classes of compounds (e.g., heterocycles) barely touched upon previously. The laboratory work illustrates and expands upon lecture material, and provides practice in spectroscopic and chromatographic techniques. Prerequisite: AUCHE 252.

#### AUCHE 380 Biochemistry I

★3 (*fi 6*) (either term, 3-0-3/2). The structure and function of proteins and enzymes and the structure, function, and metabolism of carbohydrates. The structure and function of lipids, nucleic acids, and amino acids are introduced. The course focuses on how enzymes catalyze the oxidation of carbohydrates and how the cell conserves this energy in a useful chemical form. Prerequisite: AUCHE 252. Corequisite: AUBIO 230. Note: Credit may be obtained for only one of AUCHE 380 and AUBIO 380.

#### AUCHE 381 Biochemistry II

★3 (*fi 6*) (either term, 3-0-3/2). Structure, function, and metabolism of carbohydrates, lipids, amino acids, and nucleic acids at the level of cells and organs. Prerequisites: AUBIO 380 or AUCHE 380. Note: Credit may be obtained for only one of AUCHE 381 and AUBIO 381.

#### AUCHE 390 Senior Project I

★3 (*fi 6*) (either term, 1-0-6). A research project on a specific topic in chemistry to be determined jointly by the student and professor. Prerequisite: Consent of instructor. Notes: Admission to AUCHE 390 normally requires a minimum GPA of 3.0 in Chemistry. An "Application for Individual Study" must be completed and approved before registration in the course.

#### AUCHE 392 Senior Project II

★3 (*fi 6*) (either term, 1-0-6). A research project on a specific topic in chemistry to be determined jointly by the student and professor. Prerequisite: AUCHE 390. Notes: Admission to AUCHE 392 normally requires a minimum GPA of 3.0 in Chemistry. An "Application for Individual Study" must be completed and approved before registration in the course.

#### AUCHE 397 Directed Reading I

★3 (*fi 6*) (either term, 1-0-0). Supervised literature research project. Prerequisite: Third-year standing. Notes: Admission to AUCHE 397 normally requires a minimum GPA of 3.0 in Chemistry. An "Application for Individual Study" must be completed and approved before registration in the course.

#### AUCHE 399 Directed Reading II

★3 (*fi 6*) (either term, 1-0-0). Supervised literature research project. Prerequisite: AUCHE 397. Notes: Admission to AUCHE 399 normally requires a minimum GPA of 3.0 in Chemistry. An "Application for Individual Study" must be completed and approved before registration in the course.

#### AUCHE 405 Selected Topics in Chemistry

★3 (*fi 6*) (either term, 3-0-0). In-depth examination of selected topics in Chemistry. Prerequisites: Fourth-year standing in Chemistry program and ★6 of Chemistry at the 300 level, ★3 of which must be in the subject area of the particular selected topics course.

#### AUCHE 425 Selected Topics in Analytical Chemistry

★3 (*fi 6*) (either term, 3-0-0). In-depth examination of selected topics in Analytical Chemistry. Prerequisites: Fourth-year standing in Chemistry program and ★6 of Chemistry at the 300 level, 3 of which must be in Analytical Chemistry.

#### AUCHE 435 Selected Topics in Inorganic Chemistry

★3 (*fi 6*) (either term, 3-0-0). In-depth examination of selected topics in Inorganic Chemistry. Prerequisites: Fourth-year standing in Chemistry program and ★6 of Chemistry at the 300 level, ★3 of which must be in Inorganic Chemistry.

#### AUCHE 455 Selected Topics in Organic Chemistry

★3 (*fi 6*) (either term, 3-0-0). In-depth examination of selected topics in Organic Chemistry. Prerequisites: Fourth-year standing in Chemistry program and ★6 of Chemistry at the 300 level, ★3 of which must be in Organic Chemistry.

#### AUCHE 485 Selected Topics in Biochemistry

★3 (*fi 6*) (either term, 3-0-0). In-depth examination of selected topics in Biochemistry. Prerequisites: Fourth-year standing in Chemistry program; ★3 AUCHE 381 or AUBIO 381; and an additional ★3 of AUCHE at the 300-level. Note: Credit may only be obtained for one of AUBIO 485 and AUCHE 485.

#### AUCHE 489 Directed Reading in Lipid Biochemistry

★3 (*fi 6*) (either term, 1-0-0). Biochemistry of lipids, lipoproteins, and membranes. The course extends and deepens material covered in AUCHE 381 by examining some of the theories, experiments, and methods used to investigate lipid biochemistry. Prerequisite: AUCHE 381. It is strongly recommended that AUBIO 389 precede AUCHE 489. Notes: Admission to AUCHE 489 normally requires a minimum GPA of 3.0 in Chemistry. An "Application for Individual Study" must be completed and approved before registration in the course. Credit may be obtained for only one of AUCHE 489 and AUBIO 489.

#### AUCHE 490 Advanced Project I

★3 (*fi 6*) (either term, 1-0-6). A research project on a specific topic in chemistry to be determined jointly by the student and professor. Prerequisite: AUCHE 390. Notes: Admission to AUCHE 490 normally requires a minimum GPA of 3.0 in

Chemistry. An "Application for Individual Study" must be completed and approved before registration in the course.

#### AUCHE 492 Advanced Project II

★3 (*fi 6*) (either term, 1-0-6). A research project on a specific topic in chemistry to be determined jointly by the student and professor. Prerequisite: AUCHE 390. Notes: Admission to AUCHE 492 normally requires a minimum GPA of 3.0 in Chemistry. An "Application for Individual Study" must be completed and approved before registration in the course.

## 231.25 Augustana Faculty - Classical Studies, AUCLA

Department of Humanities  
Augustana Faculty

### Undergraduate Courses

#### AUCLA 100 Greek Civilization

★3 (*fi 6*) (either term, 3-0-0). A survey of the major contributions of the Greeks to Western civilization in art, architecture, education, literature, philosophy, and politics.

#### AUCLA 102 Greek and Roman Mythology

★3 (*fi 6*) (either term, 3-0-0). Survey of classical mythology based on readings in translation from ancient literature. Study of the influence of classical mythology on art, film, literature, and music.

#### AUCLA 193 Selected Topics in Greek and Roman Art and Archaeology

★3 (*fi 6*) (either term, 3-0-0). Selected topics in Greek and Roman art and archaeology. Note: Credit may be obtained for only one of AUCLA 193, 293 or AUART 260.

#### AUCLA 194 Selecting Topics in Greek and Roman Art and Archeology Tour

★3 (*fi 6*) (Spring/Summer, 3 weeks). Three-week studytour of ancient Greek and/or Roman sites. Prerequisite: AUCLA 193, 293 or AUART 260. Note: Tour costs are the responsibility of the student. Credit may be obtained for only one of AUCLA 194, 294 or AUART 265.

#### AUCLA 221 History of Ancient Greece I

★3 (*fi 6*) (either term, 3-0-0). History of Greece from the Bronze Age to the Persian Wars. Note: Credit may be obtained for only one of AUCLA 221 and AUHIS 203.

#### AUCLA 222 History of Ancient Greece II

★3 (*fi 6*) (either term, 3-0-0). History of Greece from the Persian Wars to the end of the Hellenistic Age. Note: Credit may be obtained for only one of AUCLA 222 and AUHIS 204.

#### AUCLA 223 History of the Roman Republic

★3 (*fi 6*) (either term, 3-0-0). History of the Roman Republic from its beginnings to the Battle of Actium in 31 B.C. Note: Credit may be obtained for only one of AUCLA 223 and AUHIS 207.

#### AUCLA 224 History of the Roman Empire

★3 (*fi 6*) (either term, 3-0-0). History of the Roman Empire from the time of Augustus to the fall of the west in the fifth century A.D. Note: Credit may be obtained for only one of AUCLA 224 and AUHIS 208.

#### AUCLA 242 Greek and Roman Epic in Translation

★3 (*fi 6*) (either term, 3-0-0). Study of Greek and Roman epic poetry in English translation, including works of Homer, Hesiod, Apollonius of Rhodes, Vergil, Ovid, and Lucan.

#### AUCLA 243 Greek and Roman Tragedy in Translation

★3 (*fi 6*) (either term, 3-0-0). Study of Greek and Roman tragedy in English translation, including works of Aeschylus, Sophocles, Euripides, and Seneca.

#### AUCLA 244 Greek and Roman Comedy in Translation

★3 (*fi 6*) (either term, 3-0-0). Study of Greek and Roman comedy in English translation, including works of Aristophanes, Menander, Plautus, and Terence.

#### AUCLA 291 Greek Art and Archaeology

★3 (*fi 6*) (either term, 3-0-0). Survey of Greek art, architecture, and archaeology from the Bronze Age to the Hellenistic Age.

#### AUCLA 292 Classics Tour (Greece)

★3 (*fi 6*) (Spring/Summer, 3 weeks). Three-week study tour on selected topics in the archaeology, art, and architecture of ancient Greece. Prerequisite: AUCLA 291 or consent of the instructor. Note: Tour costs are the responsibility of the student.

#### AUCLA 293 Selected Topics in Greek and Roman Art and Archaeology

★3 (*fi 6*) (either term, 3-0-0). Selected topics in Greek and Roman art and archaeology. Note: Credit may be obtained for only one of AUCLA 193, 293 or AUART 260.



**AUCLA 294 Selected Topics in Greek and Roman Art and Archaeology Tour**

★3 (fi 6) (spring/summer, 3 weeks). Three-week study tour of ancient Greek and/or Roman sites. Prerequisite: AUCLA 193, 293 or AUART 260. Note: Tour costs are the responsibility of the student. Credit may be obtained for only one of AUCLA 194, 294 or AUART 265.

**AUCLA 301 Directed Reading I**

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of Classics as defined by the student and a supervising instructor. Prerequisite: Consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUCLA 302 Directed Reading II**

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of Classics as defined by the student and a supervising instructor. Prerequisite: Consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUCLA 303 Directed Reading III**

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of Classics as defined by the student and a supervising instructor. Prerequisite: Consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUCLA 304 Directed Reading IV**

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of Classics as defined by the student and a supervising instructor. Prerequisite: Consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUCLA 305 Directed Reading V**

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of Classics as defined by the student and a supervising instructor. Prerequisite: Consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUCLA 310 Ancient Greek Philosophy**

★3 (fi 6) (either term, 3-0-0). Survey of ancient Greek philosophy from its origins with the Pre-Socratics up to and including Plato and Aristotle. Prerequisites: AUPHI 101 and 102 preferred, but not necessary. Note: Credit may be obtained for only one of AUCLA 310 and AUPHI 311.

**AUCLA 361 Women in Greece and Rome**

★3 (fi 6) (either term, 3-0-0). Survey of the Greek and Roman attitudes toward women as reflected in art, literature, law, and religion.

## 231.26 Augustana Faculty - Community Service Learning, AUCL

Department of Social Sciences  
Augustana Faculty

### Undergraduate Courses

**AUCL 300 Theory and Practice of Community Service-Learning**

★3 (fi 6) (either term, 3-0-0). An in-depth exploration of theories and practices of civic engagement and community change for students who have already completed a course with a CSL component and who wish to extend their volunteer experience. Prerequisite: Completion of a course with a CSL component and consent of instructor. Note: For information about Augustana CSL, consult the Learning and Beyond office. For courses in programs and departments that offer a CSL component, see the link on the Augustana Faculty website [www.augustana.ualberta.ca/csl](http://www.augustana.ualberta.ca/csl).

**AUCL 350 Selected Topics in Community Service-Learning**

★1-6 (variable) (variable, variable). Content varies from year to year. Topics and credit value announced prior to registration period. Prerequisite: consent of the instructor. Corequisite: variable.

**AUCL 360 Community Service-Learning Practicum**

★1-6 (variable) (variable, variable). Content varies from year to year but will include a significant service component. Topics and credit value announced prior to registration period. Prerequisite: consent of the instructor. Corequisite: variable.

**AUCL 480 Directed Study in Community Service-Learning**

★3 (fi 6) (either term, 3-0-0). Individual study opportunity on topics for which no specific course is currently offered. Prerequisite: Consent of the instructor based on completion of a CSL placement (a record of courses and students can be found in the Learning and Beyond office).

## 231.27 Augustana Faculty - Computing Science, AUCL

Department of Science  
Augustana Faculty

### Undergraduate Courses

**AUCSC 110 Introduction to Computing Science**

★3 (fi 6) (first term, 3-0-1.5). Historical overview of the development of modern computers; computer applications and the social implications of information technology; the user interface and system design principles; introduction to programming and the software life cycle; overview of programming languages and introduction to program translation; gates, circuits, and Boolean logic; the architecture of a von Neumann machine; Turing machines and the theory of computation; artificial intelligence; computers and society. Prerequisite: Pure Mathematics 30 or Mathematics 30-1.

**AUCSC 120 Abstraction, Design, and Object-Oriented Programming**

★3 (fi 6) (either term, 3-0-3). Introduction to programming, problem solving, and designing large software systems using an object-oriented programming language (typically Java); objects, classes, methods, messages, parameters, inheritance, encapsulation, binding, polymorphism; algorithmic constructs; basic data structures; overview of software engineering. Prerequisite: Pure Mathematics 30 or Mathematics 30-1 Corequisites: AUMAT 110 or 111, and 120.

**AUCSC 210 Algorithm Analysis and Data Structures**

★3 (fi 6) (first term, 3-0-1.5). Introduction to algorithm analysis and O-notation. Abstract data types (lists, stacks, queues, trees, priority queues, dictionaries, sets), their implementations (linked lists, binary trees, heaps, binary search trees, balanced search trees, hash tables), and associated algorithms (iterators, enumerators, traversal, sorting, searching, retrieval). Prerequisites: AUCSC 120, AUMAT 110 or 111, and 120. Corequisite: AUMAT 250.

**AUCSC 220 Software Engineering and Human-Computer Interfaces**

★3 (fi 6) (first term, 3-0-1.5). Software engineering paradigms, requirements specification, object-oriented design, visual modelling, software verification and maintenance; software environments and software engineering tools; introduction to human-computer communication and interfaces; societal implications such as the cost of failure and professional responsibilities. Corequisite: AUCSC 210.

**AUCSC 250 Computer Organization and Architecture I**

★3 (fi 6) (first term, 3-0-1.5). Introduction to computer systems as multilevel machines. Topics include data representation; the organization and execution cycle of Von Neumann machines; assembly-level programming, addressing modes, control flow, procedure calls, input/output, interrupts, caching; finite state machines, Boolean algebra, logic gates, and digital circuits. Prerequisite: AUCSC 120.

**AUCSC 310 Algorithm Design and Analysis**

★3 (fi 6) (second term, 3-0-1.5). Introduction to graph theory; data structures for the representation of graphs, digraphs, and networks, and their associated algorithms (traversal, connected components, topological sorting, minimum-spanning trees, shortest paths, transitive closure). Dynamic equivalence relations and union-find sets; amortized analysis. String matching. Algorithm design techniques (divide-and-conquer, dynamic programming, the greedy method). NP-completeness. Prerequisites: AUCSC 210 and AUMAT 250.

**AUCSC 315 Theory of Computing**

★3 (fi 6) (second term, 3-0-0). Models of computers including finite automata and Turing machines, computability, basics of formal languages with applications to the syntax of programming languages, unsolvable problems and their relevance to the semantics of programming, and concepts of computational complexity, including algorithm optimality. Prerequisites: AUCSC 110 and AUMAT 250. Note: credit may be obtained for only one of AUCSC 315 and AUMAT 355.

**AUCSC 320 Software Engineering II**

★3 (fi 6) (second term, 0-4.5L-0). Detailed study of software development processes, life cycles, and tools, especially object-oriented methods. Team work is emphasized in the completion of a large software project, from problem definition through to maintenance. Prerequisite: AUCSC 220.

**AUCSC 330 Database Management Systems I**

★3 (fi 6) (second term, 3-0-1.5). Introduction to current database management systems in theory and practice. Topics include relational database design (including entity-relationship modelling, relational schema, and normal forms); relational algebra, use of a query language (typically SQL) and other components of a current database management system; overview of database system architecture, file structures (including B-tree indices), query processing, and transaction management; new directions. Prerequisites: AUCSC 210 and AUMAT 250.

**AUCSC 340 Numerical Methods**

★3 (fi 6) (either term, 3-0-1.5). Computer arithmetic and errors, solution of systems of linear equations, root finding, interpolation, numerical quadrature, and numerical solutions of ordinary differential equations. Applications from physics are included. Prerequisites: AUMAT 120, Corequisite: AUMAT 211; or consent of the instructor. Note: Credit may be obtained for only one of AUCSC 340, AUMAT 340, AUPHY 340.

**AUCSC 350 Computer Organization and Architecture II**

★3 (fi 6) (second term, 3-0-1.5). Architecture of historical and contemporary computer systems, including CPU chips and buses, memory, secondary memory devices, and I/O interfaces. Performance enhancement techniques, including prefetching, pipelining, caching, branch prediction, out-of-order and speculative



execution, explicit parallelism, and predication are discussed. The course also includes the data path and control logic at the microarchitecture level; error detection and correction; floating-point number representation and calculation; fast arithmetic circuits; instruction sets and formats; and an overview of alternative and parallel architectures, including RISC/CISC, SIMD/MIMD, shared memory and message passing architectures. Prerequisite: AUCSC 250.

#### **AUCSC 365 Computer Graphics**

★3 (fi 6) (either term, 3-0-1.5). Overview of the principles and methodologies of computer graphics, including the representation, manipulation, and display of two- and three-dimensional objects. Prerequisites: AUCSC 210, AUMAT 110 or 111, and 120.

#### **AUCSC 368 Digital Multimedia**

★3 (fi 6) (either term, 3-0-1.5). Introduction to multimedia systems, techniques required for distributed multimedia, digital representation of multimedia information, hardware and software technology and tools for multimedia systems design, animation, hypermedia, sound, colour, vector and bitmapped images, three-dimensional graphics, networks and multimedia. Prerequisites: AUCSC 210, AUMAT 110 or 111, and 120.

#### **AUCSC 370 Programming Languages**

★3 (fi 6) (first term, 3-0-1.5). Principles of language design, abstraction, syntax and parsing, operational semantics (declaration, allocation, evaluation, run-time environment, typing, activation), and programming language paradigms (procedural, object-oriented, functional, logic programming). Prerequisites: AUCSC 210 and AUMAT 250. Corequisite: AUCSC 250.

#### **AUCSC 380 Operating Systems Concepts**

★3 (fi 6) (second term, 3-0-1.5). Operating system functions, concurrent process coordination, scheduling and deadlocks, memory management and virtual memory, secondary storage management and file systems, protection. Prerequisites: AUCSC 210 and 250.

#### **AUCSC 395 Directed Study I**

★3 (fi 6) (either term, 1-0-3). Intensive study of a specific area of Computing Science as defined by the student and a supervising instructor, including completion of a software project in the selected area. Prerequisite: ★9 of senior-level Computing Science. Notes: Admission to AUCSC 395 normally requires a minimum GPA of 3.0 in Computing Science. An "Application for Individual Study" must be completed and approved before registration in the course.

#### **AUCSC 398 Selected Topics in Computing Science**

★3 (fi 6) (either term, 3-0-1.5). Advanced study of a selected topic in computing science. The focus and content of each course offering are determined by student and faculty interests, and vary from year to year. Prerequisites: Third-year standing or consent of the instructor; previous course(s) in Computing Science as determined by the instructor.

#### **AUCSC 399 Selected Topics in Computing Science**

★3 (fi 6) (either term, 3-0-1.5). Advanced study of a selected topic in computing science. Focus and content of each course are determined by student and faculty interests, and vary from year to year. Prerequisites: Third-year standing or consent of the instructor; previous course(s) in Computing Science as determined by the instructor.

#### **AUCSC 401 Professional Practicum I**

★3 (fi 6) (variable, variable). Work experience program focused on gaining practical experience in software engineering and/or with computer software and systems as used in the workplace, and an appreciation of the demands and responsibilities of the computing profession. The practicum may be internal, either as part of an on-campus software development team or as a directed self-study (possibly leading to a professional certification), or external in the context of an off-campus work placement in software development or information systems. The practicum includes a seminar directed by a faculty supervisor or by a workplace supervisor, providing opportunity for evaluation, feedback, reflection, and the sharing of experiences and knowledge. Prerequisites: At least ★18 in Computing Science, third-year standing, and consent of the Department. Note: Participation in the practicum is by application only, and is restricted to Computing Science majors.

#### **AUCSC 402 Professional Practicum II**

★3 (fi 6) (variable, variable). Work experience program focused on gaining practical experience in software engineering and/or with computer software and systems as used in the workplace, and an appreciation of the demands and responsibilities of the computing profession. The practicum may be internal, either as part of an on-campus software development team or as a directed self-study (possibly leading to a professional certification), or external in the context of an off-campus work placement in software development or information systems. The practicum includes a seminar directed by a faculty supervisor or by a workplace supervisor, providing opportunity for evaluation, feedback, reflection, and the sharing of experiences and knowledge. Prerequisites: AUCSC 401 and consent of the Department. Note: Participation in the practicum is by application only, and is restricted to Computing Science majors.

#### **AUCSC 410 Advanced Algorithm Analysis and Computational Complexity**

★3 (fi 6) (either term, 3-0-0). Algorithmic optimality. Efficient algorithms for handling

complex data structures. Complexity classes P, NP, and P-Space. NP-completeness. Tractable and intractable problems. Methods for obtaining approximate solutions to intractable problems. Prerequisites: AUCSC 310 and 315.

#### **AUCSC 450 Parallel and Distributed Computing**

★3 (fi 6) (either term, 3-0-1.5). Parallel architectures, programming language constructs for parallel computing, parallel algorithms and complexity. Message-passing, remote procedure call, and shared-memory models. Synchronization and data coherence. Load balancing and scheduling. Appropriate applications. Prerequisites: AUCSC 210 and 350.

#### **AUCSC 455 Computer Communications Networks**

★3 (fi 6) (either term, 3-0-1.5). Current methods and practices in the use of computer networks to enable communication. Physical and architectural elements and information layers of a communication network, including communication protocols, network elements, data link, switching and routing, end-to-end protocols, LANs, and data security. Diagnostic, design, operation, and performance measurement tools that are used to implement, operate and tune a network. Comparison of different network architectures. Prerequisite: AUCSC 350. Corequisite: AUCSC 380.

#### **AUCSC 460 Artificial Intelligence**

★3 (fi 6) (either term, 3-0-1.5). Survey of concepts and applications of artificial intelligence, including knowledge representation, state-space search, heuristic search, expert systems and shells, natural language processing, propositional logic, learning and cognitive models, vision; implementation using an AI language (LISP or PROLOG). Prerequisites: AUCSC 210, 370, and AUMAT 250.

#### **AUCSC 470 Programming Language Translation**

★3 (fi 6) (either term, 3-0-1.5). In-depth study of the principles and design aspects of programming language translation, including lexical analysis, syntactic analysis, type checking, code generation, and optimization. Alternative parsing strategies (top-down, LR, recursive descent). Comparison with respect to space and time tradeoffs. Prerequisites: AUCSC 350 and 370.

#### **AUCSC 480 Operating Systems Project**

★3 (fi 6) (either term, 1-0-3). Implementation and comparison of various algorithms and techniques applicable to operating systems. Prerequisite: AUCSC 380.

#### **AUCSC 490 Social and Ethical Issues for Computing Professionals**

★3 (fi 6) (either term, 3-0-0). Historical and social context of computing; the social and ethical responsibilities of the computing professional; the risks and liabilities that can accompany a computing application; intellectual property. The course includes extensive writing assignments and oral presentations. Prerequisite: At least ★18 in Computing Science, including AUCSC 220 or 330; at least third-year standing.

#### **AUCSC 495 Directed Study II**

★3 (fi 6) (either term, 1-0-3). Intensive study of a specific area of Computing Science as defined by the student and a supervising instructor, including completion of a software project in the selected area. Prerequisite: ★9 in Computing Science at the 300 level. Notes: Admission to AUCSC 495 normally requires a minimum GPA of 3.0 in Computing Science. An "Application for Individual Study" must be completed and approved before registration in the course.

## 231.28 Augustana Faculty - Crime and Community, AUCRI

Department of Social Sciences  
Augustana Faculty

### Undergraduate Courses

#### **AUCRI 160 Introduction to Crime, Correction, and Community**

★3 (fi 6) (either term, 3-0-0). Introduction to crime and correction in Canada. The theory and practice accompanying law enforcement, trial, correctional intervention, and probation and parole are analyzed by drawing from a range of disciplinary traditions such as ethical reflection, psychological theory, social and political thought, and biological understandings of criminality. Note: Credit may be obtained for only one of AUCRI 160 and AUCRI 160.

#### **AUCRI 200 Young Offenders and the Law**

★3 (fi 6) (either term, 3-0-0). Integrative examination of theories of delinquency, the relationship of the young offender to Canadian criminal law, family, drug abuse, child abuse, and recent developments in community-based treatment programs. Note: Credit may be obtained for only one of AUCRI 200 and AUSOC 200.

#### **AUCRI 222 Canadian Social Issues**

★3 (fi 6) (either term, 3-0-0). Introduction to sociological perspectives on social problems. Various theoretical orientations are applied to contemporary Canadian social issues such as poverty, gender issues, aboriginal rights, human sexuality, and regionalism. Note: Credit may be obtained for only one of AUCRI 222 and AUSOC 222.

#### **AUCRI 224 Studies in Deviant Behaviour**

★3 (fi 6) (either term, 3-0-0). Interactionist analysis of processes accompanying

the definition of deviance, subculture formation, careers of involvement in deviant activities, and the formal and informal regulation of deviance. Prerequisite: One of AUCRI 160, AUIDS 160, AUSOC 101, 103, 105. Note: Credit may be obtained for only one of AUCRI 224 and AUSOC 224.

#### **AUCRI 225 Criminology: A Canadian Perspective**

★3 (*fi 6*) (either term, 3-0-0). Examination of anthropological and sociological explanations of crime and criminality, including a cross-cultural analysis of the social processes accompanying criminal activities. The course focuses on criminality as defined under Canadian criminal law and the traditional legal systems of Canada's aboriginal peoples. Prerequisite: One of AUCRI 160, AUIDS 160, AUSOC 101, 103, 105. Note: Credit may be obtained for only one of AUCRI 225 and AUSOC 225.

#### **AUCRI 260 Crime and Community Studies and Information Literacy**

★1 (*fi 2*) (either term, 1-0-0). Introduction to library research and skills in the discipline of Crime and Community. Prerequisite: Second-year standing in an IDS-Crime and Community degree program. Corequisite: Second-year standing in Crime and Community. Any senior course in Crime and Community that requires library research. Notes: The corequisite must be taken concurrently. Credit may be obtained for only one of AUCRI 260, AUPOL 201, AUSOC 231.

#### **AUCRI 327 Crimes of the Powerful**

★3 (*fi 6*) (either term, 3-0-0). Why is it that so much attention is paid to "street crime" while the crimes of the powerful go virtually unpunished and sometimes unnoticed? A comprehensive examination of the prevalence and impact of crime committed by the powerful, including white collar occupational crime, corporate crimes, and crimes committed by the state. Prerequisite: One of AUCRI 160, 224, 225, 353, AUIDS 160, AUPOL 353, AUSOC 224, 225. Note: Credit may be obtained for only one of AUCRI 327, 427, AUSOC 327, 427.

#### **AUCRI 353 Law, Politics, and the Judicial Process**

★3 (*fi 6*) (either term, 3-0-0). Examination of the Canadian judicial branch of government in comparative perspective. The course probes court structures; judicial independence, appointment, discipline, and removal; judicial decision making processes; and courts and the public policy process. Prerequisite: One of AUPOL 103, 104, 221, AUCRI 160, AUIDS 160. Note: Credit may be obtained for only one of AUCRI 353 and AUPOL 353.

#### **AUCRI 422 The Canadian Charter of Rights and Freedoms**

★3 (*fi 6*) (either term, 3-0-0). Study of the Canadian Charter and its effect on Canadian politics and government. The course traces the development of Charter jurisprudence and examines the Charter's effect on federalism, public policy (including criminal law), and political culture. Prerequisite: One of AUPOL 103, 104, 221, AUCRI 160, AUIDS 160. Note: Credit may be obtained for only one of AUCRI 422 and AUPOL 422.

#### **AUCRI 427 Crimes of the Powerful**

★3 (*fi 6*) (either term, 3-0-0). Why is it that so much attention is paid to "street crime" while the crimes of the powerful go virtually unpunished and sometimes unnoticed? A comprehensive examination of the prevalence and impact of crime committed by the powerful, including white collar occupational crime, corporate crimes, and crimes committed by the state. Prerequisite: One of AUCRI 160, 224, 225, 353, AUIDS 160, AUPOL 353, AUSOC 224, 225. Note: Credit may be obtained for only one of AUCRI 327, 427, AUSOC 327, 427.

#### **AUCRI 453 Women and the Law**

★3 (*fi 6*) (either term, 3-0-0). This course explores historical and contemporary relationships between women and the Canadian legal system. The course uses feminist legal theory to explore the evolution of areas of Canadian law of particular interest to women (for example: reproduction, abortion, family law, rape laws, criminal law) and political activism around the law and women's issues. Prerequisites: One of AUCRI 353, AUPOL 353, 355 or AUIDS 230. Notes: Credit may be obtained for only one of AUCRI 453 and AUPOL 453.

#### **AUCRI 488 Law and Forensic Psychology**

★3 (*fi 6*) (either term, 3-0-0). Examination of the psychology of criminal behaviour and the legal system. Topics covered include theories of criminal behaviour, jury selection and decision-making, police interrogations and confessions, eyewitness testimony, and risk assessment and offender intervention programs. Prerequisite: AUPSY 240. Note: Credit may be obtained for only one of AUCRI 488 and AUPSY 488.

instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **AUDRA 123 Introduction to Oral Communication**

★3 (*fi 6*) (either term, 1-2L-0). Study in speech and rhetoric for effective oral communication and interpretation. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **AUDRA 138 Theatre Company**

★3 (*fi 6*) (first term, 0-6L-0). Ensemble production of improvisational or scripted plays. Involves an extensive research component appropriate to the chosen production. Prerequisite: Consent of the instructor, based on audition.

#### **AUDRA 139 Theatre Company**

★3 (*fi 6*) (second term, 0-6L-0). Ensemble production of improvisational or scripted plays. Involves an extensive research component appropriate to the chosen production. Prerequisite: Consent of the instructor, based on audition. Note: Distinct from AUDRA 138 in that it is a separate production with a different director.

#### **AUDRA 141 Introduction to Dramatic Process**

★3 (*fi 6*) (either term, 0-6L-0). Speech and movement improvisation with an emphasis on imaginative development; introduction to the process of acting and to dramatic form.

#### **AUDRA 148 Community Theatre**

★2 (*fi 4*) (two term, 0-4L-0). Two-credit course offered over the full year, including participation in all scheduled performances. Participation in the course is determined by audition - being cast in a significant role in the chosen production. Prerequisite: Consent of the Division. Note: An "Application for Community Theatre Studies" must be completed and approved before registration in the course.

#### **AUDRA 201 History and Critical Analysis of Theatre**

★3 (*fi 6*) (either term, 3-0-0). Survey of crucial works, genres, and styles, within the history of Western theatre along with the critical analysis of contemporary theatrical presentations. Prerequisite: AUDRA 101.

#### **AUDRA 220 Introduction to Voice and Speech for Actors**

★3 (*fi 6*) (either term, 0-6L-0). Introduction to the workings of the human voice and its application to spoken texts.

#### **AUDRA 228 Drama Studies and Information Literacy**

★1 (*fi 2*) (either term, 1-0-0). Introduction to library research skills in the discipline of Drama. Prerequisite: Second-year standing in a Drama degree program. Corequisite: Any senior course in Drama that requires library research. Notes: The corequisites must be taken concurrently. Credit may be obtained for only one of AUDRA 228, AUENG 204, AUFRE 210, AUGER 210, AUSCA 210.

#### **AUDRA 230 Acting Techniques I**

★3 (*fi 6*) (either term, 0-6L-0). Introduction to scene study with an emphasis on character and text analysis. Prerequisites: AUDRA 141, or Drama 30, or consent of the instructor (based on an audition).

#### **AUDRA 238 Theatre Company**

★3 (*fi 6*) (first term, 0-6L-0). Ensemble production of improvisational or scripted plays. Involves an extensive research component appropriate to the chosen production. Prerequisites: AUDRA 141, and consent of the instructor based on audition.

#### **AUDRA 239 Theatre Company**

★3 (*fi 6*) (second term, 0-6L-0). Ensemble production of improvisational or scripted plays. Involves an extensive research component appropriate to the chosen production. Prerequisites: AUDRA 141, and consent of the instructor based on audition. Note: Distinct from AUDRA 238 in that it is a separate production with a different director.

#### **AUDRA 244 Improvisational Workshop**

★3 (*fi 6*) (either term, 0-6L-0). Practice in the preparation and application of improvisational theatre. Prerequisites: AUDRA 141 and consent of the instructor.

#### **AUDRA 248 Community Theatre**

★2 (*fi 4*) (two term, 0-4L-0). Two-credit course offered over the full year, including participation in all scheduled performances. Participation in the course is determined by audition - being cast in a significant role in the chosen production. Prerequisite: Consent of the Division. Note: An "Application for Community Theatre Studies" must be completed and approved before registration in the course.

#### **AUDRA 275 Theatre Management**

★3 (*fi 6*) (either term, 0-6L-0). Instruction and practical experience in stage management, publicity and promotion, fundraising, front of house and lighting and sound operation in a repertory theatre setting. Prerequisite: Second-year standing.

#### **AUDRA 301 Directed Reading I**

★3 (*fi 6*) (either term, 1-0-0). Intensive study of a specific area of Drama to be defined by the student and a supervising instructor. Prerequisite: Consent of the instructor. Notes: An "Application for Individual Study" must be completed and approved before registration in the course. The course is intended for a student with a major in Drama.

## 231.29 Augustana Faculty - Drama, AUDRA

Department of Fine Arts  
Augustana Faculty

### Undergraduate Courses

#### **AUDRA 101 Play Analysis**

★3 (*fi 6*) (either term, 3-0-0). Survey and critical analysis of dramatic literature from ancient Greek to contemporary. Requires payment of additional student

**AUDRA 310 Modern Canadian Drama**

★3 (fi 6) (either term, 3-0-0). Survey of Canadian Drama designed to familiarize students with the dramatic literature and theatrical practices of a representative group of twentieth century Canadian playwrights. Prerequisite: AUDRA 101. Note: Credit may be obtained for only one of AUDRA 310 and AUENG 385.

**AUDRA 312 Shakespeare**

★3 (fi 6) (either term, 3-2L-0). Selected works of Shakespeare. Prerequisites: AUDRA 201. Note: Credit may be obtained for only one of AUDRA 312, AUENG 233, 333.

**AUDRA 320 Vocal Masque**

★3 (fi 6) (either term, 0-6L-0). Exploration, practice, and experimentation in performer-created theatre using the technique of "vocal masque." Prerequisite: AUDRA 230.

**AUDRA 338 Theatre Company**

★3 (fi 6) (first term, 0-6L-0). Ensemble production of improvisational or scripted plays. Involves an extensive research component appropriate to the chosen production. Prerequisites: AUDRA 238 or 239, and consent of the instructor based on audition.

**AUDRA 339 Theatre Company**

★3 (fi 6) (second term, 0-6L-0). Ensemble production of improvisational or scripted plays. Involves an extensive research component appropriate to the chosen production. Prerequisites: AUDRA 238 or 239, and consent of the instructor based on audition. Note: Distinct from AUDRA 338 in that it is a separate production with a different director.

**AUDRA 340 Movement for the Theatre**

★3 (fi 6) (either term, 0-6L-0). Exploration of movement for the performer; study and development toward an awareness of the physical body in space; and study in expression and personal movement patterns. Prerequisite: AUDRA 141 or 230 or consent of the instructor.

**AUDRA 345 Popular Theatre: Theatre for Education and Action**

★3 (fi 6) (either term, 0-6L-0). Study and practice of "social action" and "educational" theatre for special populations. The course explores the many possible ways and means of creating theatre for these audiences, including improvisational methods through collective creation. Prerequisite: Third year standing or consent of the instructor.

**AUDRA 346 Drama in Education**

★3 (fi 6) (either term, 0-6L-0). Study and practice of drama in education and theatre for young audiences, including exploration into developmental and collective theatre techniques that can be directly applied to the classroom. Prerequisites: AUDRA 141 and consent of the instructor. Notes: The course is appropriate for a student who is planning to teach at the elementary school level.

**AUDRA 348 Community Theatre**

★2 (fi 4) (two term, 0-4L-0). Two-credit course offered over the full year, including participation in all scheduled performances. Participation in the course is determined by audition - being cast in a significant role in the chosen production. Prerequisite: Consent of the Division. Note: An "Application for Community Theatre Studies" must be completed and approved before registration in the course.

**AUDRA 350 Introduction to Directing**

★3 (fi 6) (either term, 0-6L-0). Fundamentals of directing explored through practical exercises. Prerequisites: AUDRA 141 and consent of the instructor. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**AUDRA 360 Dramaturgy**

★3 (fi 6) (either term, 3-0-0). Role of the dramaturge, in theory and practice, in professional and amateur theatre. Offers a bridge between the academic (theoretical and historical) and the practical (communicating to an audience) aspects of the discipline. Prerequisite: AUDRA 101 or 201 or consent of the instructor.

**AUDRA 367 Critical Discourse and the Fine Arts**

★3 (fi 6) (either term, 0-3s-0). Introduction to Theory and the Fine Arts. A critical study of historical and contemporary issues in the fine arts with an emphasis on themes common to the disciplines of drama, music and the visual arts as cultural processes. Discussions of various theoretical positions including critical and cultural theory, aesthetic theory, disciplinary history and a history of criticism. Prerequisite: Third-year standing. Note: Credit may be obtained for only one of AUDRA 367, 467, AUART 367, 467, AUMUS 367,467.

**AUDRA 384 Playwriting**

★3 (fi 6) (either term, 0-3s-0). Study of the theory of, and practice in, writing for the stage. Prerequisites: AUDRA 230, or consent of the instructor. Note: Credit may be obtained for only one of AUDRA 384, 484 (2008), AUENG 319.

**AUDRA 395 Canadian Theatre Festivals Tour**

★3 (fi 6) (either term, 1-0-0). Includes 1 week tour. Examination of the significance of two festivals to Canadian theatre history and exploration of the impact of G. B. Shaw and William Shakespeare on Western theatre. This course analyses texts from the current year's festivals and includes a week-long tour to Canada's

two major theatre festivals The Shaw Festival at Niagara-on-the-Lake and the Stratford Festival at Stratford. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**AUDRA 396 Selected Topics**

★3 (fi 6) (either term, 3-0-0). Advanced study of selected topics related to the theory, history, and practice of performance on stage or in secondary visual media. Prerequisite: Consent of the instructor.

**AUDRA 397 Selected Topics**

★3 (fi 6) (either term, 3-0-0). Advanced study of selected topics related to the theory, history, and practice of performance on stage or in secondary visual media. Prerequisite: Consent of the instructor.

**AUDRA 398 Selected Topics**

★3 (fi 6) (either term, 3-0-0). Advanced study of selected topics related to the theory, history, and practice of performance on stage or in secondary visual media. Prerequisite: AUDRA 101.

**AUDRA 399 Selected Topics**

★3 (fi 6) (either term, 3-0-0). Advanced study of selected topics related to the theory, history, and practice of performance on stage or in secondary visual media. Prerequisite: AUDRA 101.

**AUDRA 401 Directed Reading II**

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of concentration for highly advanced students to be defined by the student and a supervising instructor. Prerequisite: AUDRA 301. Notes: An application for Individual Study must be completed and approved before registration in the course. Must have fourth year standing and receive Department Chair approval.

**AUDRA 430 Movement and Physical Theatre**

★3 (fi 6) (either term, 0-6L-0). Introduction to the use of abstract and improvisational movement with a view to creating physical performance pieces. Prerequisite: AUDRA 320 or 340. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**AUDRA 431 Acting for the Camera**

★3 (fi 6) (either term, 0-6L-0). Introduction to the basics of acting for both television and film style productions. Emphasis is placed on truthful acting within the medium of the camera. The course will include live tapings of auditions (including selected scenes and monologues), and cold readings for sitcoms and television dramas. Prerequisites: AUDRA 230 and 244.

**AUDRA 433 Clown and Mask**

★3 (fi 6) (either term, 0-6L-0). Exploration and experimentation in impulse inspired performance using mask, improvisation and clowning techniques. Prerequisite: AUDRA 230 or 244. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**AUDRA 437 Senior Showcase**

★3 (fi 6) (either term, 0-6L-0). Research, rehearsal, production and performance of a play chosen specifically for a senior level acting ensemble. Priority given to fourth year students. Prerequisites: AUDRA 230 and 238 or 239. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**AUDRA 438 Theatre Company**

★3 (fi 6) (first term, 0-6L-0). Ensemble production of improvisational or scripted plays. Involves an extensive research component appropriate to the chosen production. Prerequisites: AUDRA 338 or 339, and consent of the instructor based on audition.

**AUDRA 439 Theatre Company**

★3 (fi 6) (second term, 0-6L-0). Ensemble production of improvisational or scripted plays. Involves an extensive research component appropriate to the chosen production. Prerequisites: AUDRA 338 or 339, and consent of the instructor based on audition. Note: Distinct from AUDRA 438 in that it is a separate production with a different director.

**AUDRA 444 Improvisation Intensive**

★3 (fi 6) (either term, 0-6L-0). Focused on the work of Viola Spolin and Paul Sills, the course will challenge students to find focus - both collectively and as an individual performer. Various problems in theatre will be addressed including how to create a spontaneous performance by applying improvisation to traditional script-acting. Prerequisite: AUDRA 244.

**AUDRA 448 Community Theatre**

★2 (fi 4) (two term, 0-4L-0). Two-credit course offered over the full year, including participation in all scheduled performances. Participation in the course is determined by audition - being cast in a significant role in the chosen production. Prerequisite: Consent of the Department. Note: An "Application for Community Theatre Studies" must be completed and approved before registration in the course.



**AUDRA 467 Critical Discourse and the Fine Arts**

★3 (fi 6) (either term, 0-3s-0). Introduction to Theory and the Fine Arts. A critical study of historical and contemporary issues in the fine arts with an emphasis on themes common to the disciplines of drama, music and the visual arts as cultural processes. Introduction to Theory and the Fine Arts. A critical study of historical and contemporary issues in the fine arts with an emphasis on themes common to the disciplines of drama, music and the visual arts as cultural processes. Discussions of various theoretical positions including critical and cultural theory, aesthetic theory, disciplinary history and a history of criticism. Prerequisite: Third-year standing. Note: Credit may be obtained for only one of AUDRA 367, 467, AUART 367, 467, AUMUS 367, 467.

**AUDRA 538 Theatre Production**

★3 (fi 6) (first term, 0-6L-0). Ensemble production of improvisational or scripted plays. Includes a research component appropriate to the chosen production. Prerequisites: AUDRA 438 and consent of the instructor based on audition.

**AUDRA 539 Theatre Production**

★3 (fi 6) (second term, 0-6L-0). Ensemble production of improvisational or scripted plays. Includes a research component appropriate to the chosen production. Prerequisites: AUDRA 439 and consent of the instructor based on audition.

## 231.30 Augustana Faculty - Economics, AUECO

Department of Social Sciences  
Augustana Faculty

**Undergraduate Courses****AUECO 101 Introduction to Microeconomics**

★3 (fi 6) (either term, 3-0-0). Economic analysis, problems, and policies, with emphasis on the Canadian economy; roles of consumers and firms in competitive and monopolistic markets; foreign ownership in the Canadian economy; distribution of income, inequality, and poverty; use of the environment; government economic policies.

**AUECO 102 Introduction to Macroeconomics**

★3 (fi 6) (either term, 3-0-0). Economic analysis, problems, and policies, with emphasis on the Canadian economy; national income and monetary theory; problems of unemployment and inflation; government monetary and fiscal policies; international trade theory, problems, and government policies. Prerequisite: AUECO 101.

**AUECO 203 Intermediate Microeconomic Analysis I**

★3 (fi 6) (either term, 3-0-0). Theory of consumer behaviour; theory of production and cost; price and output determination under competition, monopoly, and other market structures. Prerequisite: AUECO 101.

**AUECO 204 Intermediate Macroeconomic Analysis I**

★3 (fi 6) (either term, 3-0-0). National income concepts and income determination; theories of aggregate consumption, investment, and employment behaviour; monetary and fiscal policy. Prerequisite: AUECO 102.

**AUECO 206 Mathematics in Economics and Finance**

★3 (fi 6) (either term, 3-0-0). Mathematical analysis of problems arising in economics and finance, including an introduction to economic modelling; simple, compound, and continuous rates of interest; static and comparative-static analysis; optimization; annuities, mortgages, bonds, and other securities; dynamics. Prerequisites: AUECO 101 and one of AUMAT 110, 111. Note: Credit may be obtained for only one of AUECO 206, AUMGT 206, AUMAT 235.

**AUECO 212 Economics Studies and Information Literacy**

★1 (fi 2) (either term, 1-0-0). Introduction to library research skills in the discipline of Economics. Prerequisite: Second-year standing in an Economics degree program. Corequisite: Any senior course in Economics that requires library research. Notes: Credit may be obtained for only one of AUECO 212, AUMGT 212. The corequisite must be taken concurrently.

**AUECO 215 Economic Thought**

★3 (fi 6) (either term, 3-0-0). Survey of the history of economic thought, focusing on the major schools of thought from classical political economy to post-war neoclassicism. Prerequisite: AUECO 101.

**AUECO 220 Thinking Strategically**

★3 (fi 6) (either term, 3-0-0). Introduction to game theory and strategic thinking in economics, business, and related disciplines. Prerequisites: Pure Mathematics 30 or Mathematics 30-1 and AUECO 101.

**AUECO 251 History of Canadian Economic Development**

★3 (fi 6) (either term, 3-0-0). Survey of Canada's economic development from before Confederation until the present. Note: Credit may be obtained for only one of AUECO 251 and AUHIS 262.

**AUECO 252 India Tour Orientation**

★3 (fi 6) (second term, 3-0-0). Examination of the intersection between religion

and development in India. Students research and present on a particular topic relevant to the intersection of religion and development, as well as participate in team building exercises. Issues such as health and safety, travel preparations, dealing with culture shock, and the regional geography of India will be covered. Prerequisite: One of AUREL 100, 283, AUECO 101, consent of the instructor. Note: This is a prerequisite course for the India Tour (AUECO 254/AUREL 266). Costs associated with the India Tour (3-weeks) and applicable tuition are the responsibility of the student. Enrolment is limited to 15 students. This course can only be taken by students who also register in AUECO 254/AUREL 266. Credit may be obtained for only one of AUECO 252, 253 (2007), AUREL 260, 265 (2007).

**AUECO 254 India Tour**

★3 (fi 6) (Spring/Summer, variable). Three-week study tour of India that focuses on a chosen region of India in order to examine the intersection between religious belief and practice and development challenges. Students will be exposed to various development projects as well as an array of religious sites. It is expected that students will gain an in depth understanding of India, its cultural and religious diversity, and the challenges it faces in the 21st century. Students will be exposed to both rural and urban life. Prerequisite: AUECO 252 or AUREL 260. Notes: Costs associated with this India Tour course and applicable tuition are the responsibility of the students. Enrolment is limited to 15 students. Credit may be obtained for only one of AUECO 254 and AUREL 266.

**AUECO 257 The International Economy in Historical Perspective I**

★3 (fi 6) (either term, 3-0-0). Economic analysis of modern economic growth focusing on the Industrial Revolution and its consequences. Critical thinking about why the Industrial Revolution and its related economic growth models can and/or cannot be generalized worldwide is also encouraged.

**AUECO 258 The International Economy in Historical Perspective II**

★3 (fi 6) (either term, 3-0-0). Economic analysis of the international economy during the past century. Topics examined include the disintegration of national and international economies after World War I, the Great Depression, and the fate of national and international economies after World War II. Critical thinking about whether international economic integration has promoted worldwide economic growth and stability is also encouraged.

**AUECO 264 Globalization and Growth**

★3 (fi 6) (first term, 3-0-0). Study of globalization and its role in economic development from a historical perspective. This course will examine the pros and cons of globalization, reasons countries trade, the distributional consequences of trade, and the role of multinational and international organizations. Prerequisite: AUECO 101.

**AUECO 311 Introductory Econometrics**

★3 (fi 6) (either term, 3-0-3). Introduction to the application of econometric methods in economics and business. The focus is on major topics in econometrics with emphasis on applied regression methods. Prerequisites: AUSTA 153 and AUECO 203.

**AUECO 323 Industrial Organization**

★3 (fi 6) (either term, 3-0-0). Exploration of various patterns of internal organization in industries, focusing on the relations among the structure, conduct, and performance of the industries. Prerequisite: AUECO 101. Note: Credit may be obtained for only one of AUECO 323 and AUMGT 323.

**AUECO 333 Money and Banking in Canada**

★3 (fi 6) (either term, 3-0-0). Study of the role of money and of monetary institutions and policy in the framework of Canadian financial institutions. Prerequisite: AUECO 101.

**AUECO 336 Economics of Financial Markets**

★3 (fi 6) (either term, 3-0-0). Examination of economic approaches to financial market activity: the meaning and measurement of risk, portfolio investment choices and market equilibrium, theory of interest and the term structure of interest rates, inter-temporal and macro-policy issues, and debt management. Prerequisite: AUECO 101.

**AUECO 341 Environmental Economics**

★3 (fi 6) (either term, 3-0-0). Examination of the relationships between the economy and the environment. Emphasis is placed on the application of economic analysis to various environmental issues. Prerequisite: AUECO 101. Note: Credit may be obtained for only one of AUECO 341 and AUENV 341.

**AUECO 346 Agricultural Economics**

★3 (fi 6) (either term, 3-0-0). Study of economic theory and policy relating to the agricultural sector of the economy. Emphasis is placed on the economic aspects of agricultural production, marketing, finance, and resource use with particular reference to agricultural policy in Canada and Alberta. Prerequisite: AUECO 101.

**AUECO 360 International Economics**

★3 (fi 6) (either term, 3-0-0). Examination of the theories of international trade and investment, the international monetary system, and the multinational firm. Prerequisite: AUECO 101.

**AUECO 363 International Finance**

★3 (fi 6) (either term, 3-0-0). Examination of the types of international transactions,



exchange rate determination, balance of payments adjustments, macroeconomics in an open economy, and other issues in the international monetary system. Prerequisite: AUECO 102.

#### **AUECO 364 Development Economics**

★3 (fi 6) (either term, 3-0-0). Survey of the major approaches to and problems of economic development in the less-developed nations. Particular emphasis is placed on issues relating to capital accumulation, income distribution, population growth and employment, and international economic relations. Prerequisite: AUECO 101.

#### **AUECO 380 Selected Topics in Economics**

★3 (fi 6) (either term, 3-0-0). This course covers selected topics in Economics. Topics may vary from year to year depending on the instructor and student interest. Prerequisites: AUECO 101 and 102. Notes: Minimum third year standing.

#### **AUECO 381 Selected Topics in Economics**

★3 (fi 6) (either term, 3-0-0). This course covers selected topics in Economics. Topics may vary from year to year depending on the instructor and student interest. Prerequisites: AUECO 101 and 102. Notes: Minimum third year standing.

#### **AUECO 384 Intermediate Microeconomic Analysis II**

★3 (fi 6) (first term, 3-0-0). Designed for majors in Economics, dealing with extensions and applications of microeconomic theory; topics include intertemporal choice, risk, uncertainty and expected utility; oligopoly and game theory; externalities, public goods, adverse selection, moral hazard, and asymmetric information; general equilibrium. Prerequisites: AUECO 203 and AUMAT 110 or equivalent.

#### **AUECO 385 Intermediate Macroeconomic Analysis II**

★3 (fi 6) (second term, 3-0-0). Designed for majors in Economics. Theories of stabilization policy; expectations; the government budget constraint; inflation and unemployment; business cycles and growth; theories of aggregate consumption, investment, money demand and money supply. Prerequisites: AUECO 203, 204 and AUMAT 110 or equivalent.

#### **AUECO 393 Public Sector Economics**

★3 (fi 6) (either term, 3-0-0). Analysis of the use of resources for public purposes by all levels of government, emphasizing the rationale for public expenditures, taxation structures, and public choice mechanisms. Prerequisite: AUECO 102.

#### **AUECO 397 Directed Reading I**

★3 (fi 6) (either term, 3-0-0). Intensive study of a specific area of economics as defined by the student and a supervising instructor. Prerequisite: Consent of the instructor. Notes: An "Application for Individual Study" must be completed and approved before registration in the course. The course is intended primarily for a student planning to pursue graduate studies in economics.

#### **AUECO 398 Directed Reading II**

★3 (fi 6) (either term, 3-0-0). Intensive study of a specific area of economics as defined by the student and a supervising instructor. Prerequisites: AUECO 397 or 497, and consent of the instructor. Notes: An "Application for Individual Study" must be completed and approved before registration in the course. The course is intended primarily for a student planning to pursue graduate studies in economics.

#### **AUECO 422 Industrial Organization and Policy**

★3 (fi 6) (either term, 3-0-0). Examination of oligopoly theory, the economics of mergers and takeovers, competition policy, and industry regulation. Prerequisites: AUECO 203 and AUECO/AUMGT 323. Note: Credit may be obtained for only one of AUECO 422, AUMGT 422.

#### **AUECO 436 Economics of Financial Markets**

★3 (fi 6) (either term, 3-0-0). Examination of economic approaches to financial market activity: the meaning and measurement of risk, portfolio investment choices and market equilibrium, theory of interest and the term structure of interest rates, inter-temporal and macro-policy issues, and debt management. Prerequisite: AUECO 101.

#### **AUECO 449 Economic Methods of Project Evaluation**

★3 (fi 6) (either term, 3-0-0). Analysis of investment projects using various economic methods. Topics include the use of cost-benefit analysis, impact analysis, and methods to examine the relations among economic activity, the environment, and development. Prerequisites: AUECO 203 and 204.

#### **AUECO 463 International Finance**

★3 (fi 6) (either term, 3-0-0). Examination of the types of international transactions, exchange rate determination, balance of payments adjustments, macroeconomics in an open economy, and other issues in the international monetary system. Prerequisite: AUECO 102.

#### **AUECO 465 International Trade Policy and Applications**

★3 (fi 6) (either term, 3-0-0). Examination of various trade models. The application of economic tools to international trade policy; tariffs, quotas, export subsidies, and application of game theory to international trade. Prerequisite: AUECO 203. Note: AUECO 360 is highly recommended.

#### **AUECO 480 Ethics in Economics and Business**

★3 (fi 6) (either term, 3-0-0). Investigation of the relation between ethical reflection and the activities of businesses and economics. Attention is paid to the role of

self-interest and rationality in economic and business discourse, the relation between the price system and human values, and the morality of the market as a means of social organization. Several case studies are used. Prerequisite: At least ★6 at a senior-level in Economics or Management.

#### **AUECO 497 Directed Reading I**

★3 (fi 6) (either term, 3-0-0). Intensive study of a specific area of economics as defined by the student and a supervising instructor. Prerequisite: Consent of the instructor. Notes: An "Application for Individual Study" must be completed and approved before registration in the course. The course is intended primarily for a student planning to pursue graduate studies in economics.

#### **AUECO 498 Directed Reading II**

★3 (fi 6) (either term, 3-0-0). Intensive study of a specific area of economics as defined by the student and a supervising instructor. Prerequisites: AUECO 397 or 497, and consent of the instructor. Notes: An "Application for Individual Study" must be completed and approved before registration in the course. The course is intended primarily for a student planning to pursue graduate studies in economics.

## 231.31 Augustana Faculty - Education Field Experience, AUEFX

Department of Social Sciences  
Augustana Faculty

### Undergraduate Courses

#### **AUEFX 200 Introduction to the Profession of Teaching**

★3 (fi 6) (either term, 2-0-4). Orientation to teaching. For the laboratory component of the course, a student spends half a day per week assisting in a local elementary or secondary school. Note: Credit may be obtained for only one of AUEFX 200 and 201.

#### **AUEFX 201 Orientation to Teaching**

★3 (fi 6) (either term, 2-0-6). Introductory education course with a field experience component for a student intending to teach at the elementary or secondary level. The field experience component consists of two three-hour or three two-hour blocks of time per week assisting in a local school classroom. Notes: The course is designed for a student intending to apply for admission to the Faculty of Education at the University of Lethbridge, which requires a field experience component of at least 60 hours. Credit may be obtained for only one of AUEFX 201 and 200.

## 231.32 Augustana Faculty - Educational Computing, AUEDC

Department of Science  
Augustana Faculty

### Undergraduate Courses

#### **AUEDC 202 Technology Tools for Teaching and Learning**

★3 (fi 6) (either term, 3-0-1.5). Exploration, at both the introductory and more advanced levels, of the most common information technology tools currently used in schools, including tools for internet access, digital media processing, multimedia/hypermedia presentations, spreadsheets, and databases. Prerequisite: Basic computer skills, preferably within a MS Windows environment, including word processing, e-mail, and use of a web browser.

## 231.33 Augustana Faculty - Educational Psychology, AUEPS

Department of Social Sciences  
Augustana Faculty

### Undergraduate Courses

#### **AUEPS 258 Educational Psychology for Teaching**

★3 (fi 6) (either term, 2-0-1). Introduction to the fundamental concepts and issues in educational psychology. The focus is on the child from preschool to adolescence through examination of learning and instruction, individual differences, motivation, assessment, and classroom management. Prerequisite: AUPSY 102.

## 231.34 Augustana Faculty - English, AUENG

Department of Humanities  
Augustana Faculty

## Undergraduate Courses

### AUENG 103 English Literature from the Romantic Period to the Present

★3 (fi 6) (either term, 3-0-0). Examination of works of literature in English from the major literary periods and principal genres from the Romantic period up to the present. British, United States, and Canadian literatures are represented. Prerequisite: ELA 30-1.

### AUENG 104 English Literature from the Middle Ages to the Romantic Period

★3 (fi 6) (either term, 3-0-0). Examination of works of literature in English from the major literary periods and principal genres from the Middle Ages to the end of the eighteenth century. Prerequisite: AUENG 103.

### AUENG 202 Women's Writing and Feminist Theology

★3 (fi 6) (either term, 3-0-0). Several contemporary feminist theological approaches will be used to analyze religious and devotional writings by women from various historical periods and areas of the English-speaking world. Texts in the areas of scripture, systematic theology, ethics, and feminist theory and spirituality will be analyzed to understand the importance of feminist theological practice in dialogue with the Judeo-Christian tradition and women's struggles for justice and well-being. Literary texts will include fiction, poetry, essays and personal narrative by authors such as Toni Morrison, Louise Erdrich, Alice Sebold, Emily Dickinson, Adrienne Rich, and Louise Glück. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 302.

### AUENG 204 English and Information Literacy

★1 (fi 2) (either term, 1-0-0). Introduction to library research skills in the discipline of English. Prerequisite: Second-year standing in an English degree program. Corequisite: Any senior course in English that requires library research. Notes: The corequisite must be taken concurrently. Credit may be obtained for only one of AUENG 204, AUFRE 210, AUDRA 228, AUGER 210 and AUSCA 210.

### AUENG 205 Children's Literature

★3 (fi 6) (either term, 3-0-0). Offers a critical study of literature written for or appropriated by children. The course considers the historical development of children's literature and examines prevailing and changing attitudes toward children. It addresses major themes and issues in children's literature, and studies significant texts representative of important genres and trends in the field. Critical analysis of the literature will be stressed. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 305.

### AUENG 207 Aboriginal/Indigenous Literature

★3 (fi 6) (either term, 3-0-0). Offers a critical study of literature by First Peoples, including narratives from the oral tradition, fiction, poetry, drama, essays, and personal narratives. Themes will include traditional and contemporary perspectives on gender, cultural and political identity, and spirituality. Multiple critical approaches (aesthetic, linguistic, political, historical, and cultural) will be employed in examining this literature, including selections from Native critical texts. Content, period, and national focus will vary. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 307.

### AUENG 208 African Literature

★3 (fi 6) (either term, 3-0-0). Survey of African literature in English from a variety of genres. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 308.

### AUENG 211 The History of the English Language

★3 (fi 6) (either term, 3-0-0). Introduction to the historical development of the English language from its Indo-European roots to its present-day forms, including Canadian English. Prerequisites: AUENG 103 and 104. Formerly part of AUENG 213. Note: Not to be taken by students with credit in AUENG 213, 311 or 313.

### AUENG 212 The English Language

★3 (fi 6) (either term, 3-0-0). Introduction to the structures, varieties, and uses of contemporary English. Prerequisites: AUENG 103 and 104. Formerly part of AUENG 213. Note: Not to be taken by students with credit in AUENG 213, 312 or 313.

### AUENG 213 The English Language

★3 (fi 6) (either term, 3-0-0). Introduction to the structures, varieties and uses of contemporary English, and a survey of its historical development. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 211, 212, 311, 312 or 313.

### AUENG 215 Creative Writing

★3 (fi 6) (either term, 3-0-0). Introduction to the writing of poetry and short fiction. Literary examples are analyzed, and a student is required to write poetry and fiction with attention to specific elements of writing such as imagery, structure, dialogue, and characterization. A central element of the course is peer discussion. Prerequisites: AUENG 103 and 104.

### AUENG 221 Chaucer

★3 (fi 6) (either term, 3-0-0). Selected works by Chaucer, with emphasis on *The Canterbury Tales*. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 321.

### AUENG 225 Middle Ages

★3 (fi 6) (either term, 3-0-0). Old and Middle English literature (excluding

Chaucer) in its social and cultural contexts. Some works are read in translation and some in the original. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 325.

### AUENG 230 The Early English Renaissance

★3 (fi 6) (either term, 3-0-0). Literature of sixteenth-century England, including Shakespeare, showing the influence of Renaissance ideas and literary forms. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 330.

### AUENG 231 The Later English Renaissance

★3 (fi 6) (either term, 3-0-0). Literature of the early seventeenth century (excluding Milton) in relation to the intellectual and historical developments of the period. Representative writers include Donne, Jonson, Herbert, Herrick, Marvell, Bacon, Burton, and Wroth. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 331.

### AUENG 233 Shakespeare

★3 (fi 6) (either term, 3-2L-0). Selected works of Shakespeare. Prerequisites: AUENG 103 and 104. Note: Credit may be obtained for only one of AUENG 233, 333, AUDRA 312.

### AUENG 239 Milton

★3 (fi 6) (either term, 3-0-0). Study of the development and artistry of Milton's poetry and selected prose, with emphasis on *Paradise Lost*, *Paradise Regained*, and *Samson Agonistes*. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 339.

### AUENG 241 The Augustan Age

★3 (fi 6) (either term, 3-0-0). Literature - poetry, prose, drama, and fiction - of the period from 1660 to 1745. The majority of the authors of this period, including Dryden, Wycherley, Behn, Astell, Fyge, Swift, Pope, and Defoe, were above all concerned with a person's relation to other people, the practical questions of ethical behaviour. The predominant mode was satiric. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 341.

### AUENG 243 The Age of Sensibility

★3 (fi 6) (either term, 3-0-0). Literature - poetry, prose, and fiction - of the period between 1745 and 1800. This period saw the rise of the novel as an art form with such acknowledged masters as Fielding and Austen. Initially its poets became more introspective, moving away from the predominantly social concerns of the previous age, though by the end of the period writers fired by revolutionary zeal, like Wolstonecraft, Burns, and Blake, attacked the status quo and the power structures it supported. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 343.

### AUENG 252 The British Romantic Period

★3 (fi 6) (either term, 3-0-0). Representative works of the Romantic poets, and related prose materials. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 352.

### AUENG 254 The Earlier Victorian Age

★3 (fi 6) (either term, 3-0-0). Representative works of three major poets: Tennyson, Browning, and Arnold. As well, one novel by Dickens and one novel by another author are studied. Attention is also given to essays by at least three of the following: T. Carlyle, J. H. Newman, J. S. Mill, J. Ruskin, M. Arnold, and T. H. Huxley. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 354.

### AUENG 255 The Later Victorian Age

★3 (fi 6) (either term, 3-0-0). Representative works of the later Victorians including Hardy, Wilde, and Gissing. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 355.

### AUENG 261 The Modern British Novel

★3 (fi 6) (either term, 3-0-0). Representative works of early twentieth-century British novelists including Joyce, Woolf, and D. H. Lawrence. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 361.

### AUENG 265 Modern and Contemporary Poetry

★3 (fi 6) (either term, 3-0-0). Representative works of British, United States, and other English-speaking poets. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 365.

### AUENG 267 Contemporary Literature

★3 (fi 6) (either term, 3-0-0). Representative literary works of the latter half of the twentieth century, particularly those written within the last two decades. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 367.

### AUENG 268 Women and Environmental Literature

★3 (fi 6) (either term, 3-0-0). Study of women's writing about nature and environment focusing on various themes relevant to environmental literature, primarily the various ways that the natural world is represented in literature, and the relationship between cultural constructions of nature and cultural constructions of gender, class, race, and sexuality. Works include fiction, poetry, and/or nonfiction. An introduction to several ecofeminist theorists provides a critical framework for exploring images and themes in women's environmental literature. Prerequisites:

AUENG 103 and 104. Note: Credit may be obtained for only one of AUENG 268, 368, AUENV 268, 368.

**AUENG 269 The End of the World: Contemporary Apocalyptic Literature**

★3 (fi 6) (either term, 3-0-0). A study of the contemporary speculative creative writers who consider the end of the world as we know it and the relationship of this literature to a growing body of scientific evidence that warns of global collapse if current damaging human practices are not abated. Consideration will be given to these works as cautionary tales, thought experiments, and socio-political satire. Prerequisites: AUENG 103 and 104. Note: Credit may be obtained for only one of AUENG 269, 369, AUENV 269, 369.

**AUENG 270 United States Literature to 1865**

★3 (fi 6) (either term, 3-0-0). Representative works of American literature from discovery and the Puritan migration in the 16th and 17th centuries through the American Civil War (1861-1865). Genres will include poetry, personal narrative, speeches and essays, short stories and novels. Authors will include lesser known writers alongside Hawthorne, Melville, Poe, Stowe, Dickinson and Whitman. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 370.

**AUENG 271 United States Literature since 1865**

★3 (fi 6) (either term, 3-0-0). Representative works of American literature since the American Civil War (1861-1865). Genres will include poetry, personal narrative, speeches and essays, short stories and novels. Authors will include lesser known writers alongside Howells, Wharton, Faulkner, Plath, Pynchon, Morrison, Pinsky, Erdrich, Chabon and DeLillo. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 371.

**AUENG 280 Canadian Literature to 1950**

★3 (fi 6) (either term, 3-0-0). As well as giving a broad sweep of the development of Canadian literature from colonial times to the middle of the twentieth century, the course focuses on three movements: the Confederation poets such as Roberts, Carman, Lampman, and D.C. Scott; the emergence of fictional realism in the works of Grove, Callaghan, MacLennan, and Wilson; and the revolt of the poets of the 1920s, F. R. Scott, Smith, Pratt, Klein, and Livesay. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 380.

**AUENG 281 Canadian Literature since 1950**

★3 (fi 6) (either term, 3-0-0). Development of literature in English in Canada from the middle of the twentieth century to the present, an age that some have termed postmodernist. The course focuses on the rise and fall of realism in fiction and also the emergence of distinctively Canadian voices among our poets. Included are works by Laurence, Atwood, Wiebe, Munro, Davies, Birney, Page, Purdy, and Layton. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 381.

**AUENG 290 History of English Literary Criticism**

★3 (fi 6) (either term, 3-0-0). Survey of major developments in literary criticism in England from the seventeenth through the twentieth century. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 390.

**AUENG 291 Contemporary Criticism**

★3 (fi 6) (either term, 3-0-0). Examination of trends in contemporary criticism such as Marxist, feminist, structuralist, and poststructuralist criticism. Prerequisites: AUENG 103 and 104. Notes: Limited to majors and minors in English.

**AUENG 292 Feminist Critical Theory and Women's Writing**

★3 (fi 6) (either term, 3-0-0). Several contemporary feminist critical approaches will be used to analyze writings by women from various historical periods and areas of the English-speaking world. Prerequisites: AUENG 103 and 104. Note: Not to be taken by students with credit in AUENG 392.

**AUENG 302 Women's Writing and Feminist Theology**

★3 (fi 6) (either term, 3-0-0). Several contemporary feminist theological approaches will be used to analyze religious and devotional writings by women from various historical periods and areas of the English-speaking world. Texts in the areas of scripture, systematic theology, ethics, and feminist theory and spirituality will be analyzed to understand the importance of feminist theological practice in dialogue with the Judeo-Christian tradition and women's struggles for justice and well-being. Literary texts will include fiction, poetry, essays and personal narrative by authors such as Toni Morrison, Louise Erdrich, Alice Sebold, Emily Dickinson, Adrienne Rich, and Louise Glück. Prerequisites: AUENG 103 and 104, and ★6 in English at the 200-level (excluding AUENG 204, 215, 291). Note: Not to be taken by students with credit in AUENG 202.

**AUENG 305 Children's Literature**

★3 (fi 6) (either term, 3-0-0). Offers a critical study of literature written for or appropriated by children. The course considers the historical development of children's literature and examines prevailing and changing attitudes toward children. It addresses major themes and issues in children's literature, and studies significant texts representative of important genres and trends in the field. Critical analysis of the literature will be stressed. Prerequisites: AUENG 103 and 104, and ★6 in English at the 200-level (excluding AUENG 204, 215, 291). Note: Not to be taken by students with credit in AUENG 205.

**AUENG 307 Aboriginal/Indigenous Literature**

★3 (fi 6) (either term, 3-0-0). Offers a critical study of literature by First Peoples,

including narratives from the oral tradition, fiction, poetry, drama, essays, and personal narratives. Themes will include traditional and contemporary perspectives on gender, cultural and political identity, and spirituality. Multiple critical approaches (aesthetic, linguistic, political, historical, and cultural) will be employed in examining this literature, including selections from Native critical texts. Content, period, and national focus will vary. Prerequisites: AUENG 103 and 104, and ★6 in English at the 200-level [excluding AUENG 204, 215, 291]. Note: Not to be taken by students with credit in AUENG 207.

**AUENG 308 African Literature**

★3 (fi 6) (either term, 3-0-0). Survey of African literature in English from a variety of genres. Prerequisites: AUENG 103, 104 and ★6 in English at the 200 level [excluding AUENG 204, 215, 291]. Not to be taken by students with credit in AUENG 208.

**AUENG 311 The History of the English Language**

★3 (fi 6) (either term, 3-0-0). Introduction to the historical development of the English language from its Indo-European roots to its present-day forms, including Canadian English. Prerequisites: AUENG 103 and 104, and ★6 in English at the 200-level [excluding AUENG 204, 215, 291]. Formerly part of AUENG 213. Note: Not to be taken by students with credit in AUENG 211, 213 or 313.

**AUENG 312 The English Language**

★3 (fi 6) (either term, 3-0-0). Introduction to the structures, varieties, and uses of contemporary English. Prerequisites: AUENG 103 and 104, and ★6 in English at the 200-level [excluding AUENG 204, 215, 291]. Formerly part of AUENG 213. Note: Not to be taken by students with credit in AUENG 212, 213 or 313.

**AUENG 313 The English Language**

★3 (fi 6) (either term, 3-0-0). Introduction to the structures, varieties and uses of contemporary English, and a survey of its historical development. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level [excluding AUENG 204, 215, 291]. Note: Not to be taken by students with credit in AUENG 211, 212, 213, 311, or 312.

**AUENG 314 Advanced Creative Writing: Poetry**

★3 (fi 6) (either term, 3-0-0). Continuation of the poetry instruction begun in AUENG 215. The completion of at least a draft of a chapbook-length collection of poems (20 to 48 pages) is required. Prerequisite: AUENG 215 or consent of the instructor.

**AUENG 316 Advanced Creative Writing: Fiction**

★3 (fi 6) (either term, 3-0-0). Continuation of the fiction instruction begun in AUENG 215. The completion of a chapbook-length collection of fiction (20 to 48 pages) is required. Prerequisite: AUENG 215 or consent of the instructor.

**AUENG 317 Expository Writing**

★3 (fi 6) (either term, 3-0-0). Working from a common mode of inquiry, the analysis and criticism of literary texts, the course explores some of the prevailing theories of expository writing while providing extensive practice. Prerequisite: ★6 at a senior level in English (excluding AUENG 204, 205, 206, 211, 212, 215, 311, 312, 314, 316) or consent of the instructor.

**AUENG 318 Advanced Expository Writing**

★3 (fi 6) (either term, 3-0-0). Continuation of AUENG 317. Prerequisite: AUENG 317.

**AUENG 319 Playwriting**

★3 (fi 6) (either term, 0-4L-0). Study of the theory of, and practice in, writing for the stage. Prerequisites: AUENG 215, or consent of the instructor. Notes: Credit may be obtained for only one of AUENG 319, AUDRA 384, 484 (2008).

**AUENG 321 Chaucer**

★3 (fi 6) (either term, 3-0-0). Selected works by Chaucer, with emphasis on The Canterbury Tales. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level [excluding AUENG 204, 215, 291]. Note: Not to be taken by students with credit in AUENG 221.

**AUENG 325 Middle Ages**

★3 (fi 6) (either term, 3-0-0). Old and Middle English literature (excluding Chaucer) in its social and cultural contexts. Some works are read in translation and some in the original. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level [excluding AUENG 204, 215, 291]. Note: Not to be taken by students with credit in AUENG 225.

**AUENG 330 The Early English Renaissance**

★3 (fi 6) (either term, 3-0-0). Literature of sixteenth-century England, including Shakespeare, showing the influence of renaissance ideas and literary forms. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level (excluding AUENG 204, 215, 291). Note: Not to be taken by students with credit in AUENG 230.

**AUENG 331 The Later English Renaissance**

★3 (fi 6) (either term, 3-0-0). Literature of the early seventeenth century (excluding Milton) in relation to the intellectual and historical developments of the period. Representative writers include Donne, Jonson, Herbert, Herrick, Marvell, Bacon, Burton, and Wroth. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level (excluding AUENG 204, 215, 291). Note: Not to be taken by students with credit in AUENG 231.



**AUENG 333 Shakespeare**

★3 (fi 6) (either term, 3-2L-0). Selected works of Shakespeare. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level (excluding AUENG 204, 215, 291). Note: Credit may be obtained for only one of AUENG 333, 233, AUDRA 312.

**AUENG 339 Milton**

★3 (fi 6) (either term, 3-0-0). Study of the development and artistry of Milton's poetry and selected prose, with emphasis on *Paradise Lost*, *Paradise Regained*, and *Samson Agonistes*. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level [excluding AUENG 204, 215, 291]. Note: Not to be taken by students with credit in AUENG 239.

**AUENG 341 The Augustan Age**

★3 (fi 6) (either term, 3-0-0). Literature - poetry, prose, drama, and fiction - of the period from 1660 to 1745. The majority of the authors of this period, including Dryden, Wycherley, Behn, Astell, Fyge, Swift, Pope, and Defoe, were above all concerned with a person's relation to other people, the practical questions of ethical behaviour. The predominant mode was satiric. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level (excluding AUENG 204, 215, 291). Note: Not to be taken by students with credit in AUENG 241.

**AUENG 343 The Age of Sensibility**

★3 (fi 6) (either term, 3-0-0). Literature - poetry, prose, and fiction - of the period between 1745 and 1800. This period saw the rise of the novel as an art form with such acknowledged masters as Fielding and Austen. Initially its poets became more introspective, moving away from the predominantly social concerns of the previous age, though by the end of the period writers fired by revolutionary zeal, like Wolstonecraft, Burns, and Blake, attacked the status quo and the power structures it supported. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level (excluding AUENG 204, 215, 291). Note: Not to be taken by students with credit in AUENG 243.

**AUENG 352 The British Romantic Period**

★3 (fi 6) (either term, 3-0-0). Representative works of the Romantic poets, and related prose materials. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level (excluding AUENG 204, 215, 291). Note: Not to be taken by students with credit in AUENG 252.

**AUENG 354 The Earlier Victorian Age**

★3 (fi 6) (either term, 3-0-0). Representative works of three major poets: Tennyson, Browning, and Arnold. As well, one novel by Dickens and one novel by another author are studied. Attention is also given to essays by at least three of the following: T. Carlyle, J. H. Newman, J. S. Mill, J. Ruskin, M. Arnold, and T. H. Huxley. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level (excluding AUENG 204, 215, 291). Note: Not to be taken by students with credit in AUENG 254.

**AUENG 355 The Later Victorian Age**

★3 (fi 6) (either term, 3-0-0). Representative works of the later Victorians including Hardy, Wilde, and Gissing. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level (excluding AUENG 204, 215, 291). Note: Not to be taken by students with credit in AUENG 255.

**AUENG 361 The Modern British Novel**

★3 (fi 6) (either term, 3-0-0). Representative works of early twentieth-century British novelists including Joyce, Woolf, and D. H. Lawrence. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level (excluding AUENG 204, 215, 291). Note: Not to be taken by students with credit in AUENG 261.

**AUENG 365 Modern and Contemporary Poetry**

★3 (fi 6) (either term, 3-0-0). Representative works of British, United States, and other English-speaking poets. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level (excluding AUENG 204, 215, 291). Note: Not to be taken by students with credit in AUENG 265.

**AUENG 367 Contemporary Literature**

★3 (fi 6) (either term, 3-0-0). Representative literary works of the latter half of the twentieth century, particularly those written within the last two decades. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level (excluding AUENG 204, 215, 291). Note: Not to be taken by students with credit in AUENG 267.

**AUENG 368 Women and Environmental Literature**

★3 (fi 6) (either term, 3-0-0). Study of women's writing about nature and environment focusing on various themes relevant to environmental literature, primarily the various ways that the natural world is represented in literature, and the relationship between cultural constructions of nature and cultural constructions of gender, class, race, and sexuality. Works include fiction, poetry, and/or nonfiction. An introduction to several ecofeminist theorists provides a critical framework for exploring images and themes in women's environmental literature. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level (excluding AUENG 204, 215, 291). Note: Credit may be obtained for only one of AUENG 268, 368, AUENV 268, 368.

**AUENG 369 The End of the World: Contemporary Apocalyptic Literature**

★3 (fi 6) (either term, 3-0-0). A study of the contemporary speculative creative writers who consider the end of the world as we know it and the relationship

of this literature to a growing body of scientific evidence that warns of global collapse if current damaging human practices are not abated. Consideration will be given to these works as cautionary tales, thought experiments, and socio-political satire. Prerequisites: AUENG 103 and 104 and ★6 in English at the 200 level (excluding AUENG 204, 215, 291). Note: Credit may be obtained for only one of AUENG 269, 369, AUENV 269, 369.

**AUENG 370 United States Literature to 1865**

★3 (fi 6) (either term, 3-0-0). Representative works of American literature from discovery and the Puritan migration in the 16th and 17th centuries through the American Civil War (1861-1865). Genres will include poetry, personal narrative, speeches and essays, short stories and novels. Authors will include lesser known writers alongside Hawthorne, Melville, Poe, Stowe, Dickinson and Whitman. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level (excluding AUENG 204, 215, 291). Note: Not to be taken by students with credit in AUENG 270.

**AUENG 371 United States Literature since 1865**

★3 (fi 6) (either term, 3-0-0). Representative works of American literature since the American Civil War (1861-1865). Genres will include poetry, personal narrative, speeches and essays, short stories and novels. Authors will include lesser known writers alongside Howells, Wharton, Faulkner, Plath, Pynchon, Morrison, Pinsky, Erdrich, Chabon and DeLillo. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level [excluding AUENG 204, 215, 291]. Note: Not to be taken by students with credit in AUENG 271.

**AUENG 380 Canadian Literature to 1950**

★3 (fi 6) (either term, 3-0-0). As well as giving a broad sweep of the development of Canadian literature from colonial times to the middle of the twentieth century, the course focuses on three movements: the Confederation poets such as Roberts, Carman, Lampman, and D.C. Scott; the emergence of fictional realism in the works of Grove, Callaghan, MacLennan, and Wilson; and the revolt of the poets of the 1920s, F. R. Scott, Smith, Pratt, Klein, and Livesay. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level (excluding AUENG 204, 215, 291). Note: Not to be taken by students with credit in AUENG 280.

**AUENG 381 Canadian Literature since 1950**

★3 (fi 6) (either term, 3-0-0). Development of literature in English in Canada from the middle of the twentieth century to the present, an age that some have termed postmodernist. The course focuses on the rise and fall of realism in fiction and also the emergence of distinctive Canadian voices among our poets. Included are works by Laurence, Atwood, Wiebe, Munro, Davies, Birney, Page, Purdy, and Layton. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level (excluding AUENG 204, 215, 291). Note: Not to be taken by students with credit in AUENG 281.

**AUENG 385 Modern Canadian Drama**

★3 (fi 6) (either term, 3-0-0). This is a survey course in Canadian Drama designed to familiarize students with the dramatic literature and theatrical practices of a representative group of twentieth century Canadian playwrights. Prerequisite: AUENG 103 and 104. Note: Credit may be obtained for only one of AUENG 385 and AUDRA 310.

**AUENG 390 History of English Literary Criticism**

★3 (fi 6) (either term, 3-0-0). Survey of major developments in literary criticism in England from the seventeenth through the twentieth century. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level (excluding AUENG 204, 215, 291). Note: Not to be taken by students with credit in AUENG 290.

**AUENG 392 Feminist Critical Theory and Women's Writing**

★3 (fi 6) (either term, 3-0-0). Several contemporary feminist critical approaches will be used to analyze writings by women from various historical periods and areas of the English-speaking world. Prerequisites: AUENG 103 and 104, and ★6 in English at the 200-level (excluding AUENG 204, 215, 291). Note: Not to be taken by students with credit in AUENG 292.

**AUENG 401 Directed Reading I**

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of English as defined by the student and a supervising instructor. Prerequisites: ★15 at a senior level in English, including at least ★3 at the 300 level, and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

**AUENG 402 Directed Reading II**

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of English as defined by the student and a supervising instructor. Prerequisites: AUENG 401 and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

**AUENG 410 Contemporary Issues in Renaissance Literature**

★3 (fi 6) (either term, 3-0-0). Study of some of the recent theoretical developments in the field of Renaissance literature. Topics may include cultural poetics, the relationship between "literary" and "nonliterary" texts, canon formation, gender studies, feminist approaches, the presence of ideology within texts, and the political contexts for literary production and circulation. Prerequisites: AUENG 103 and 104; and one of AUENG 230, 231, 233, 239, 291, 330, 331, 333, 339.



**AUENG 411 Historiographic Metafiction**

★3 (*fi 6*) (either term, 3-0-0). Examination of several postmodern literary texts that self-consciously question how past reality may be adequately known or represented. Such literature exposes the ideological assumptions underlying traditional portrayals of history, portrayals often accepted as natural, apolitical, and universal. In the process, this literature suggests the ways in which the supposedly separable categories of fiction and nonfiction may be seen to interpenetrate. Prerequisites: AUENG 103 and 104.

**AUENG 412 Selected Topics in English Studies**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, works, periods, and critical approaches. Focus and content of each course are determined by student and faculty interests, and vary from year to year. Prerequisites: Fourth-year standing or consent of the instructor; previous course(s) in English as determined by the instructor.

**AUENG 420 Selected Topics in English Studies**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, works, periods, and critical approaches. Focus and content of each course are determined by student and faculty interests, and vary from year to year. Prerequisites: Fourth-year standing or consent of the instructor; previous course(s) in English as determined by the instructor.

**AUENG 421 Selected Topics in English Studies**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, works, periods, and critical approaches. Focus and content of each course are determined by student and faculty interests, and vary from year to year. Prerequisites: Fourth-year standing or consent of the instructor; previous course(s) in English as determined by the instructor.

**AUENG 430 Selected Topics in English Studies**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, works, periods, and critical approaches. Focus and content of each course are determined by student and faculty interests, and vary from year to year. Prerequisites: Fourth-year standing or consent of the instructor; previous course(s) in English as determined by the instructor.

**AUENG 431 Selected Topics in English Studies**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, works, periods, and critical approaches. Focus and content of each course are determined by student and faculty interests, and vary from year to year. Prerequisites: Fourth-year standing or consent of the instructor; previous course(s) in English as determined by the instructor.

**AUENG 440 Selected Topics in English Studies**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, works, periods, and critical approaches. Focus and content of each course are determined by student and faculty interests, and vary from year to year. Prerequisites: Fourth-year standing or consent of the instructor; previous course(s) in English as determined by the instructor.

**AUENG 441 Selected Topics in English Studies**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, works, periods, and critical approaches. Focus and content of each course are determined by student and faculty interests, and vary from year to year. Prerequisites: Fourth-year standing or consent of the instructor; previous course(s) in English as determined by the instructor.

**AUENG 450 Selected Topics in English Studies**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, works, periods, and critical approaches. Focus and content of each course are determined by student and faculty interests, and vary from year to year. Prerequisites: Fourth-year standing or consent of the instructor; previous course(s) in English as determined by the instructor.

**AUENG 451 Selected Topics in English Studies**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, works, periods, and critical approaches. Focus and content of each course are determined by student and faculty interests, and vary from year to year. Prerequisites: Fourth-year standing or consent of the instructor; previous course(s) in English as determined by the instructor.

**AUENG 460 Selected Topics in English Studies**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, works, periods, and critical approaches. Focus and content of each course are determined by student and faculty interests, and vary from year to year. Prerequisites: Fourth-year standing or consent of the instructor; previous course(s) in English as determined by the instructor.

**AUENG 461 Selected Topics in English Studies**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, works, periods, and critical approaches. Focus and content of each course are determined by student and faculty interests, and vary from year to year. Prerequisites: Fourth-year standing or consent of the instructor; previous course(s) in English as determined by the instructor.

**231.35 Augustana Faculty - English for Academic Purposes, AUEAP**

Department of Humanities  
Augustana Faculty

**Undergraduate Courses****AUEAP 103 English for Academic Purposes I**

★3 (*fi 6*) (either term, 4-1L-0). Review of complex grammar and structures; reading strategies for advanced comprehension; composition with paragraph review, essay writing, and information organizing; listening and speaking strategies. Prerequisite: TOEFL score of at least 500 or consent of the instructor. Notes: The course is not open to a student whose first language is English. The course is designed for a student with a very advanced knowledge of English as a second language, yet who lacks the fine-tuning necessary for ease in successful use of the language. The course does not count toward the English major or minor.

**AUEAP 104 English for Academic Purposes II**

★3 (*fi 6*) (either term, 4-1L-0). Continuation of AUEAP 103. Prerequisite: AUEAP 103 or consent of the instructor. Notes: The course is not open to a student whose first language is English. The course does not count toward the English major or minor.

**231.36 Augustana Faculty - Environmental Studies, AUENV**

Department of Science  
Augustana Faculty

**Undergraduate Courses****AUENV 120 Human Activities and the Natural Environment**

★3 (*fi 6*) (either term, 3-0-0). Introductory analysis of the interrelationships between society and the natural world, environmental consequences, and human perceptions. The characteristics and interactions of physical environmental systems and various facets of resource management (including forestry, agriculture, fisheries, protected areas, endangered species, and pollution) are described and analyzed. Note: Credit may be obtained for only one of AUENV 120 and AUGEO 120.

**AUENV 210 Environmental Studies and Information Literacy**

★1 (*fi 2*) (either term, 1-0-0). Introduction to library research skills in the discipline of Environmental Studies. Prerequisite: Second-year standing in an Environmental degree program. Corequisite: Any senior course in Environmental Studies that requires library research. Notes: The corequisite must be taken concurrently. Credit may be obtained for only one of AUENV 210, AUBIO 210, AUCHE 210, AUGEO 210.

**AUENV 260 Environmental Studies Practicum**

★3 (*fi 6*) (either term, 1-3s-0). Practicum placement in a government, industry, or non-governmental organization to gain awareness and experience in an environmental field. Prerequisite: AUENV 120 or AUGEO 120. Notes: Open only to a student with a major in Environmental Studies/Science. Credit may be obtained for only one of AUENV 260 and AUIDS 260.

**AUENV 268 Women and Environmental Literature**

★3 (*fi 6*) (either term, 3-0-0). Study of women's writing about nature and environment focusing on various themes relevant to environmental literature, primarily the various ways that the natural world is represented in literature, and the relationship between cultural constructions of nature and cultural constructions of gender, class, race, and sexuality. Works include fiction, poetry, and/or nonfiction. An introduction to several ecofeminist theorists provides a critical framework for exploring images and themes in women's environmental literature. Prerequisites: AUENG 103 and 104. Note: Credit may be obtained for only one of AUENV 268, 368, AUENG 268, 368.

**AUENV 269 The End of the World: Contemporary Apocalyptic Literature**

★3 (*fi 6*) (either term, 3-0-0). A study of the contemporary speculative creative writers who consider the end of the world as we know it and the relationship of this literature to a growing body of scientific evidence that warns of global collapse if current damaging human practices are not abated. Consideration will be given to these works as cautionary tales, thought experiments, and socio-political satire. Prerequisites: AUENG 103 and 104. Note: Credit may be obtained for only one of AUENV 269, 369, AUENG 269, 369.

**AUENV 301 Directed Studies**

★3 (*fi 6*) (either term, 1-0-0). Supervised research project and intensive study of a specific area in environmental science as defined by the student and supervising instructor. Prerequisites: ★6 in Environmental Science. Notes: Admission to the course normally requires a minimum GPA of 3.0 in Environmental Studies/Science. An "Application for Individual Study" must be completed and approved before registration in the course. AUENV 301 is classified as a science course.

**AUENV 302 Directed Reading**

★3 (*fi 6*) (either term, 1-0-0). Supervised research project and intensive study of a specific area in environmental studies as defined by the student and a supervising instructor. Prerequisites: ★6 in Environmental Studies. Notes: Admission to the course normally requires a minimum GPA of 3.0 in Environmental Studies. An "Application for Individual Study" must be completed and approved before registration in the course. AUENV 302 is classified as an arts course.

**AUENV 320 Parks and Wilderness**

★3 (*fi 6*) (either term, 3-0-0). Examination of scientific principles and concepts underlying parks, wilderness and other protected area systems with emphasis on Canada. Topics include history, philosophy, conceptual frameworks, roles in sustainability, and types of biological and geographic designations. Prerequisite: One of AUBIO 253, AUENV 120, AUGEO 120, consent of the instructor. Note: Credit may be obtained for only one of AUENV 320, 420, AUGEO 320, 420.

**AUENV 322 Economic Botany**

★3 (*fi 6*) (either term, 3-0-0). Biological properties, geographical distribution, application/utilization, and history of vascular and nonvascular plants that are economically important in agriculture industry and medicine. Corequisite: AUBIO 222. Notes: Credit may be obtained for only one of AUENV 322 and AUBIO 322.

**AUENV 324 Resource and Environmental Management**

★3 (*fi 6*) (either term, 3-0-0). Integration of both physical and human phenomena in understanding natural resources, their dimensions and boundaries. Basic concepts in resource analysis and management: the decision-making process, management frameworks and strategies, legislation and regulation, impact assessment, the role of perceptions, attitudes and behaviour, and the impact of public participation/interest groups in the development of natural resources. Prerequisite: One of AUBIO 253, AUENV 120, AUGEO 120, 230, 231, consent of the instructor. Note: Credit may be obtained for only one of AUENV 324 and AUGEO 324.

**AUENV 328 Environmental Politics**

★3 (*fi 6*) (either term, 3-0-0). Examination of contemporary debates in, and the evolution of, environmental policy and politics. This course will focus on Canadian issues in a comparative perspective, exploring topics such as environmental political theory, the policy cycle, social movements, international issues, and related case studies. Prerequisite: ★3 in either Environmental Studies/Science or Political Studies. Note: Credit may be obtained for only one of AUENV 328 and AUPOL 328.

**AUENV 341 Environmental Economics**

★3 (*fi 6*) (either term, 3-0-0). Examination of the relationships between the economy and the environment. Emphasis is placed on the application of economic analysis to various environmental issues. Prerequisite: AUECO 101. Note: Credit may be obtained for only one of AUENV 341 and AUECO 341.

**AUENV 344 Environmental Psychology**

★3 (*fi 6*) (either term, 3-0-0). Systematic study of the dynamic interchange between people and their social and physical environmental contexts. Topics include theories of environmental perception, the effects of crowding, the impact of natural/urban settings, the effects of building design and colours, and managing limited resources. Prerequisites: AUPSY 102; third-year standing. Note: Credit may be obtained for only one of AUENV 344 and AUPSY 344.

**AUENV 345 Religion and Ecology**

★3 (*fi 6*) (either term, 3-0-0). Examination of the relationship between ecology and religion from Christian and non-Christian perspectives. The course looks at ecological spirituality, ecotheology, animal rights, deep ecology, ecoactivism, and ecofeminism. It also devotes substantial time to ecological themes in Asian (Hindu, Buddhist, and Chinese) and traditional (native American and Australian aboriginal) religions. Note: Credit may be obtained for only one of AUENV 345 and AUREL 345.

**AUENV 350 Conservation Theory and Biodiversity in Tropical Systems**

★3 (*fi 6*) (first term, 3-0-1). Introduction to the basic concepts of conservation biology. The scope of conservation biology and levels of biodiversity are explored, as are aspects of tropical ecology related to conservation. Prerequisite: One of AUBIO 253, 294, or 295, and consent of the instructor(s) based on successful completion of the selection process. Note: This course is intended to be taken in sequence with AUBIO 459 or AUENV 459. Credit may be obtained for only one of AUENV 350, 450, AUBIO 350, 450.

**AUENV 354 Freshwater Ecology and Management**

★3 (*fi 6*) (first term, 3-0-3). Introduction to the biological, chemical and physical features of freshwater ecosystems, and how they relate to ecological processes in and adjacent to aquatic systems. The course will examine the role of ecological patterns in lakes, ponds, rivers and streams, with an emphasis on freshwater systems and their management in western Canada. Prerequisite: AUBIO 253. Notes: Credit may be obtained for only one of AUENV 354, AUBIO 354, and AUGEO 354. The course requires participation in a field trip.

**AUENV 355 Philosophy, Technology, and the Environment**

★3 (*fi 6*) (either term, 3-0-0). Investigation of the philosophical and social issues related to technology and the environment. The natural/artificial distinction, different senses of "environment" and the ways we understand, package, and manage nature form the foundation of the course. Issues in environmental ethics are also

addressed. Thinkers may include Marx, Heidegger, Marcel, Borgmann, Winner, Singer, Regan, and others. Prerequisite: None, but AUPHI 350 would be useful. Note: Credit may be obtained for only one of AUENV 355 and AUPHI 355.

**AUENV 358 Environmental Sociology**

★3 (*fi 6*) (either term, 3-0-0). Theoretical and empirical examination of the connection between the natural environment and the social world. This involves inquiry into the sociological dimensions of some major contemporary environmental problems, including air, water and soil pollution, decreased biodiversity, deforestation, climate change, and ozone depletion. Particular attention is paid to the social and political connections among issues of industrialization, development, globalization, inequality, gender, social change and environmental destruction. Prerequisites: Third-year standing and AUENV 120 (or its cross-listed equivalent). Note: Credit may be obtained for only one of AUENV 358, 458 and AUSOC 358, 458.

**AUENV 368 Women and Environmental Literature**

★3 (*fi 6*) (either term, 3-0-0). Study of women's writing about nature and environment focusing on various themes relevant to environmental literature, primarily the various ways that the natural world is represented in literature, and the relationship between cultural constructions of nature and cultural constructions of gender, class, race, and sexuality. Works include fiction, poetry, and/or nonfiction. An introduction to several ecofeminist theorists provides a critical framework for exploring images and themes in women's environmental literature. Prerequisites: AUENG 103, 104, and ★6 in English at the 200 level (excluding AUENG 204, 215, 291). Note: Credit may be obtained for only one of AUENV 268, 368, AUENG 268, 368.

**AUENV 369 The End of the World: Contemporary Apocalyptic Literature**

★3 (*fi 6*) (either term, 3-0-0). A study of the contemporary speculative creative writers who consider the end of the world as we know it and the relationship of this literature to a growing body of scientific evidence that warns of global collapse if current damaging human practices are not abated. Consideration will be given to these works as cautionary tales, thought experiments, and socio-political satire. Prerequisites: AUENG 103 and 104 and ★6 in English at the 200 level (excluding AUENG 204, 215, 291). Note: Credit may be obtained for only one of AUENV 269, 369, AUENG 269, 369.

**AUENV 375 Canadian Environmental History**

★3 (*fi 6*) (either term, 3-0-0). Historical examination of the dynamic interrelationships between the natural world and humans, with a focus on Canadian issues within a North American context. Topics and perspectives will include: Aboriginal peoples, colonization, fur trade, exploration, settlement, western agriculture, science, and the conservation movement. Note: Credit may be obtained for only one of AUENV 375, 475, AUHIS 375, 475.

**AUENV 401 Directed Studies**

★3 (*fi 6*) (either term, 1-0-3). Supervised research project and intensive study of a specific area in environmental science as defined by the student and supervising instructor. Prerequisites: ★6 in Environmental Studies. Notes: Admission to the course normally requires a minimum GPA of 3.0 in Environmental Studies/Science. An "Application for Individual Study" must be completed and approved before registration in the course. AUENV 401 is classified as a science courses.

**AUENV 402 Directed Reading**

★3 (*fi 6*) (either term, 1-0-0). Supervised research project and intensive study of a specific area in environmental studies as defined by the student and a supervising instructor. Prerequisites: ★6 in Environmental Studies. Notes: Admission to the course normally requires a minimum GPA of 3.0 in Environmental Studies. An "Application for Individual Study" must be completed and approved before registration in the course. AUENV 402 is classified as an arts course.

**AUENV 410 Selected Topics in Environmental Studies**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of a selected topic in environmental studies. Focus and content of each course are determined by student and faculty interests, and vary from year to year. Prerequisites: Third-year standing or consent of the instructor; previous course(s) in Environmental Studies and other disciplines as determined by the instructor.

**AUENV 420 Parks and Wilderness**

★3 (*fi 6*) (either term, 3-0-0). Examination of scientific principles and concepts underlying parks, wilderness, and other protected area systems with emphasis on Canada. Topics include history, philosophy, conceptual frameworks, roles in sustainability, and types of biological and geographical designations. Prerequisite: One of AUBIO 253, AUENV 120, AUGEO 120; and one of AUBIO 350, 351, 353, 359, 450, 459, AUENV 324, 350, 353, 359, 450, 459, AUGEO 324, 351. Note: Credit may be obtained for only one of AUENV 320, 420, AUGEO 320, 420.

**AUENV 421 Environmental Science: History and Impacts**

★3 (*fi 6*) (either term, 3-0-0). Overview of the historical developments, past and current impacts, and changing roles of the field of environmental science. Prerequisites: One of AUBIO 350, 353, 450; AUENV 320, 324, 350, 353, 450; AUGEO 320, 324 and at least fourth-year standing. Note: Credit may be obtained for only one of AUENV 421 and AUGEO 421.

**AUENV 425 Environmental Impact Assessment**

★3 (*fi 6*) (either term, 3-0-0). History and theory of environmental impact

assessment; legislative and policy frameworks; role in resource planning; methods and techniques for the assessment of impacts; future directions. Prerequisites: One of AUENV 324, AUGEO 324, and AUBIO 253. Note: Credit may be obtained for only one of AUENV 425, 325 (2009), AUGEO 325 (2009), 425.

#### **AUENV 459 Field Studies in Tropical Ecology and Conservation**

★3 (fi 6) (second term, 1.5-0-0 2 weeks field work). Field course that addresses problems of biodiversity and conservation in tropical environments. The student participates in field workshops, and designs and conducts his or her own field project to answer questions related to ecological and biological conservation. Prerequisite: AUBIO 350 or AUENV 350, and consent of the instructors based on successful completion of the selection process. Notes: Credit may be obtained for only one of AUBIO 459 and AUENV 459. Students who have received credit for AUBIO 359 or AUENV 359 may enrol in AUBIO 459 or AUENV 459 in a subsequent year based on successful completion of the selection process. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **AUENV 475 Canadian Environmental History**

★3 (fi 6) (either term, 3-0-0). Historical examination of the dynamic interrelationships between the natural world and humans, with a focus on Canadian issues within a North American context. Topics and perspectives will include: Aboriginal peoples, colonization, fur trade, exploration, settlement, western agriculture, science, and the conservation movement. Prerequisite: One of AUHIS 260, 261. Note: Credit may be obtained for only one of AUENV 375, 475, AUHIS 375, 475.

## 231.37 Augustana Faculty - French, AUFRE

Department of Humanities  
Augustana Faculty

### Undergraduate Courses

#### **AUFRE 101 Beginners' French I**

★3 (fi 6) (first term, 4-0-0). AUFRE 101 and 102 are designed to develop ability in reading and writing French, with a strong emphasis on the development of comprehension and oral communication skills. During this process the student participates in a wide variety of interactive activities and is also exposed to contemporary francophone culture. These two courses not only encourage the student to think critically about the principles of grammar as they relate to the French language, but also stimulate an in-depth understanding of the principles by which language functions in general. These two courses also lead the student through the steps of reflective learning as he or she considers and discusses language learning strategies. Notes: The course is not open to a student with credit in French 20, or to a student with French 30 or equivalent. AUFRE 101 does not count toward the major in Modern Languages or the minor in French.

#### **AUFRE 102 Beginners' French II**

★3 (fi 6) (second term, 4-0-0). Continuation of AUFRE 101. Prerequisite: French 20 or AUFRE 101 or consent of the instructor. Notes: The course is not open to a student with French 30 or equivalent. AUFRE 102 does not count toward the major in Modern Languages or the minor in French.

#### **AUFRE 201 Intermediate French I**

★3 (fi 6) (first term, 4-0-0). Intensive training in spoken and written French. The major focus is on communication. Prerequisite: French 30 or AUFRE 102. Notes: A student wishing to register in AUFRE 201 must first take an on-line placement test. The purpose of the test is to advise the student of the appropriate level at which to begin university French.

#### **AUFRE 202 Intermediate French II**

★3 (fi 6) (second term, 4-0-0). Further development of the speaking, reading, and writing skills acquired in AUFRE 201. The major focus is on formal grammar. Prerequisite: One of AUFRE 201; French 31a or 31b or 31c, with a sufficient score on the on-line placement test; French Language Arts 20 or 30 (equal to French immersion), with a sufficient score on the on-line placement test; consent of the instructor.

#### **AUFRE 210 French Studies and Information Literacy**

★1 (fi 2) (either term, 1-0-0). Introduction to library research skills in the discipline of French. Prerequisite: Second-year standing in a Modern Languages degree program. Corequisite: Any senior course in French that requires library research. Notes: The corequisite must be taken concurrently. Credit may be obtained for only one of AUFRE 210, AUENG 204, AUDRA 228, AUGER 210, AUSCA 210.

#### **AUFRE 222 French Pronunciation and Phonetics**

★3 (fi 6) (either term, 3-0-0). Study of the French Phonetic System to improve French pronunciation. Prerequisite: AUFRE 201. Corequisite: AUFRE 202.

#### **AUFRE 234 Selected Topics in French Language**

★3 (fi 6) (either term, 3-0-0). Study of selected topics in French language studies. Focus and content of each course will vary from year to year.

#### **AUFRE 235 Selected Topics in French Language**

★3 (fi 6) (either term, 3-0-0). Study of selected topics in French language studies. Focus and content of each course will vary from year to year.

#### **AUFRE 237 Selected Topics in French Literature**

★3 (fi 6) (either term, 3-0-0). Study of selected topics in French literature. Focus and content of each course will vary from year to year.

#### **AUFRE 239 Selected Topics in French Literature**

★3 (fi 6) (either term, 3-0-0). Study of selected topics in French literature. Focus and content of each course will vary from year to year.

#### **AUFRE 301 Advanced French I**

★3 (fi 6) (first term, 4-0-0). As a normal sequel to AUFRE 202, the course develops further the speaking, reading, and writing skills acquired at the Intermediate level. The major focus is on formal grammar. Prerequisite: One of AUFRE 202; French 31a or 31b or 31c, with a sufficient score on the on-line placement test; French Language Arts 20 or 30 (equal to French immersion), with a sufficient score on the on-line placement test; consent of the instructor.

#### **AUFRE 305 Aspects of Civilization and Culture of France I**

★3 (fi 6) (either term, 3-0-0). French civilization and culture up to the French Revolution as seen from historical, geographical, social, and cultural points of view. The course aims at improving the student's command of oral and written French. Prerequisite: One of AUFRE 202; Français 20 or 30, with a sufficient score on the on-line placement test; French 31a or 31b or 31c, with a sufficient score on the on-line placement test; French Language Arts 20 or 30 (equal to French immersion), with a sufficient score on the on-line placement test; consent of the instructor.

#### **AUFRE 306 Aspects of Civilization and Culture of France II**

★3 (fi 6) (either term, 3-0-0). French civilization and culture of modern France as seen from historical, geographical, social, and cultural points of view. The course aims at improving the student's command of oral and written French. Prerequisite: One of AUFRE 202; Français 20 or 30 or French 31a or 31b or 31c, with a sufficient score on the on-line placement test; French Language Arts 20 or 30 (equal to French immersion) with a sufficient score on the on-line placement test; consent of the instructor.

#### **AUFRE 307 Topics in the History and Culture of Southern France**

★3 (fi 6) (second term, 3-0-0). Aspects of the social, political and religious history, as well as the arts, architecture and literature of Southern France. All lectures and readings are in English. Note: Credit may be obtained for only one of AUFRE 307 and AUHIS 329.

#### **AUFRE 308 Tour of Southern France**

★2 (fi 4) (Spring/Summer, 2 weeks). Tour of Southern France: History and culture. To complement the topics covered in AUFRE 307. Prerequisite: AUFRE 305 or 307. Notes: Enrolment limited to a maximum of 10 students. Credit may be obtained for only one of AUFRE 308 and AUHIS 333. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **AUFRE 310 Advanced Translation: French into English**

★3 (fi 6) (either term, 3-0-0). For students having a fair knowledge of French and the total fluency in English. The aim of the course is to improve the student's ability to understand and render into idiomatic English complex constructions, nuances of meaning, and stylistic devices. The translation of texts by Francophone authors forms the basis of class activity. Prerequisite: AUFRE 202.

#### **AUFRE 311 Advanced Translation: English into French**

★3 (fi 6) (either term, 3-0-0). Intensive training in translation into French of contemporary texts written in English. Prerequisite: AUFRE 301.

#### **AUFRE 317 Business French**

★3 (fi 6) (either term, 2-0-1). Study of the French language (oral and written) as used in the francophone business milieu and in the administrative sector. A student is introduced to the technical vocabulary required to function competently in situations revolving around business life. Prerequisite: AUFRE 301 or consent of the instructor.

#### **AUFRE 331 French-Canadian Literature**

★3 (fi 6) (either term, 3-0-0). Introduction to the literature of French Canada through a study of representative texts. Included are works by Louis Hémon, Gabrielle Roy, Anne Hébert, Gérard Bessette, Marie-Claire Blais, Emile Nelligan, and Michel Tremblay or Marcel Dubé. Prerequisite: AUFRE 392 or 393.

#### **AUFRE 332 Introduction to French-Canadian Short Stories**

★3 (fi 6) (either term, 3-0-0). Introduction to short stories of twentieth-century French Canada. Prerequisite: One of AUFRE 202; Français 20 or 30, with a sufficient score on the on-line placement test; French 31a or 31b or 31c, with a sufficient score on the on-line placement test; French Language Arts 20 or 30 (equal to French immersion), with a sufficient score on the on-line placement test; consent of the instructor.

#### **AUFRE 333 Aspects of French-Canadian Civilization and Culture**

★3 (fi 6) (either term, 3-0-0). Evolution of political, economic, and social patterns in Québec. Documentary sources from the mass media and artistic productions are



studied as expressions of lifestyles, ideas, and values. Prerequisite: One of AUFRE 202, Français 20, 30, French 31a or 31b or 31c, consent of the instructor.

#### **AUFRE 334 Selected Topics in French Language**

★3 (*fi 6*) (either term, 3-0-0). Study of selected topics in French language studies. Focus and content of each course will vary from year to year.

#### **AUFRE 335 Selected Topics in French Language**

★3 (*fi 6*) (either term, 3-0-0). Study of selected topics in French language studies. Focus and content of each course will vary from year to year.

#### **AUFRE 337 Selected Topics in French Literature**

★3 (*fi 6*) (either term, 3-0-0). Study of selected topics in French literature. Focus and content of each course will vary from year to year.

#### **AUFRE 339 Selected Topics in French Literature**

★3 (*fi 6*) (either term, 3-0-0). Study of selected topics in French literature. Focus and content of each course will vary from year to year.

#### **AUFRE 341 Children's Literature in French**

★3 (*fi 6*) (either term, 3-0-0). The critical analysis of selected children's literature written in French. These works will be examined in their historical perspective. Prerequisite: AUFRE 392 or 393 or consent of the instructor.

#### **AUFRE 342 Francophone Women's Writing**

★3 (*fi 6*) (either term, 3-0-0). The study of selected works by Francophone women writers. Feminist literary theory is employed to analyze the texts. Prerequisite: AUFRE 392 or 393.

#### **AUFRE 355 French Literature of the Seventeenth Century**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the literature and society of the century of Louis XIV through a study of representative texts including works from what is generally regarded as the golden age of French drama. Prerequisite: AUFRE 392 or 393.

#### **AUFRE 370 French Literature of the Nineteenth Century**

★3 (*fi 6*) (either term, 3-0-0). Introduction to French literature of the nineteenth century through a study of representative texts which are analyzed in depth. Prerequisite: AUFRE 392 or 393.

#### **AUFRE 380 French Literature of the Twentieth Century**

★3 (*fi 6*) (either term, 3-0-0). Introduction to French literature of the twentieth century through a study of representative texts which are analyzed in depth. Prerequisite: AUFRE 392 or 393.

#### **AUFRE 390 Introduction to French Literature I**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the study of French literature as a discipline. Texts chosen from different periods and genres of French literature are situated in their socio-historical context and studied not only for their own intrinsic value, but also for their specific value in assisting a student to master techniques of textual analysis. The course focuses on the postrevolutionary era and is taught in French. Assignments are submitted in English. Prerequisite: AUFRE 202 or consent of the instructor. Note: Credit may be obtained for only one of AUFRE 390 and 392.

#### **AUFRE 391 Introduction to French Literature II**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the study of French literature as a discipline. Texts chosen from different periods and genres of French literature are situated in their socio-historical context and studied not only for their own intrinsic value, but also for their specific value in assisting a student to master techniques of textual analysis. The course focuses on the prerevolutionary era and is taught in French. Assignments are submitted in English. Prerequisite: AUFRE 202 or consent of the instructor. Note: Credit may be obtained for only one of AUFRE 391 and 393.

#### **AUFRE 392 Introduction to French Literature I**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the study of French literature as a discipline. Texts chosen from different periods and genres of French literature are located in their socio-historical context and studied not only for their own intrinsic value, but also for their specific value in assisting a student to master techniques of textual analysis. The course focuses on the postrevolutionary period. Prerequisite: AUFRE 202 or consent of the instructor. Note: Credit may be obtained for only one of AUFRE 390 and 392.

#### **AUFRE 393 Introduction to French Literature II**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the study of French literature as a discipline. Texts chosen from different periods and genres of French literature are located in their socio-historical context and studied not only for their own intrinsic value, but also for their specific value in assisting a student to master techniques of textual analysis. The course focuses on the prerevolutionary era. Prerequisite: AUFRE 202 or consent of the instructor. Note: Credit may be obtained for only one of AUFRE 391 and 393.

#### **AUFRE 402 Directed Study: Language**

★3 (*fi 6*) (either term, 1-0-0). Intensive study of the French language. Prerequisite: AUFRE 301 or consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

#### **AUFRE 403 Directed Reading**

★3 (*fi 6*) (either term, 1-0-0). Intensive study of a specific area of French literature and/or civilization as defined by the student and the instructor. Prerequisite: AUFRE 301. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

#### **AUFRE 496 Selected Topics in French Literature**

★3 (*fi 6*) (either term, 3-0-0). Study of selected authors, periods, works, methodologies, etc. Focus and content of each course are determined by the individual instructor in the light of student needs, and vary from year to year. Prerequisite: Fourth-year standing or consent of the instructor.

#### **AUFRE 497 Selected Topics in French Literature**

★3 (*fi 6*) (either term, 3-0-0). Study of selected authors, periods, works, methodologies, etc. Focus and content of each course are determined by the individual instructor in the light of student needs, and vary from year to year. Prerequisite: Fourth-year standing or consent of the instructor.

#### **AUFRE 498 Selected Topics in French Literature**

★3 (*fi 6*) (either term, 3-0-0). Study of selected authors, periods, works, methodologies, etc. Focus and content of each course are determined by the individual instructor in the light of student needs, and vary from year to year. Prerequisite: Fourth-year standing or consent of the instructor.

#### **AUFRE 499 Selected Topics in French Literature**

★3 (*fi 6*) (either term, 3-0-0). Study of selected authors, periods, works, methodologies, etc. Focus and content of each course are determined by the individual instructor in the light of student needs, and vary from year to year. Prerequisite: Fourth-year standing or consent of the instructor.

## 231.38 Augustana Faculty - Geography, AUGEO

Department of Science  
Augustana Faculty

### Undergraduate Courses

#### **AUGEO 120 Human Activities and the Natural Environment**

★3 (*fi 6*) (either term, 3-0-0). Introductory analysis of the interrelationships between society and the natural world, environmental consequences, and human perceptions. The characteristics and interactions of physical environmental systems and various facets of resource management (including forestry, agriculture, fisheries, protected areas, endangered species, and pollution) are described and analyzed. Note: Credit may be obtained for only one of AUGEO 120 and AUENV 120.

#### **AUGEO 210 Geography and Information Literacy**

★1 (*fi 2*) (either term, 1-0-0). Introduction to library research skills in the discipline of Geography. Prerequisite: Second-year standing in a Geography minor. Corequisite: Any senior course in Geography that requires library research. Notes: The corequisite must be taken concurrently. Credit may be obtained for only one of AUGEO 210, AUBIO 210, AUCHE 210, AUENV 210.

#### **AUGEO 218 Introduction to Geographic Information Systems**

★3 (*fi 6*) (either term, 3-0-3). Introduction to fundamentals and applications of Geographic Information Systems. Topics include the nature of geographic data, geo-referencing systems, geographic modelling, data collection and management, and spatial analysis. Practical applications of GIS will be emphasized with the use of appropriate computer software. Prerequisite: Any 100-level science course.

#### **AUGEO 230 Geomorphology**

★3 (*fi 6*) (either term, 3-0-3). Analysis of (1) geomorphological processes and agents (such as movement of the earth's crust, volcanism, water, glaciers, waves, currents, wind, and gravity) that create and modify the earth's surface and (2) landforms.

#### **AUGEO 231 Climatology**

★3 (*fi 6*) (either term, 3-0-3). Study of (1) elements and processes of climate and weather; (2) distributions and regional patterns of climates; and (3) interrelationships among climates, plants, animals, and people. Note: AUGEO 230 need not precede AUGEO 231.

#### **AUGEO 242 Cultural Geography of Scandinavia**

★3 (*fi 6*) (either term, 3-0-0). Survey of Scandinavian life and achievement, past and present, with emphasis on social and cultural conditions against a geographical and historical background. All lectures and readings are in English. Note: Credit may be obtained for only one of AUGEO 242 and AUSCA 231.

#### **AUGEO 301 Directed Studies**

★3 (*fi 6*) (either term, 1-0-3). Supervised research project and intensive study of a specific area of geography as defined by the student and a supervising instructor. Prerequisite: ★6 in Geography. Admission to the course normally requires a minimum GPA of 3.0 in Geography. An "Application for Individual Study" must



be completed and approved before registration in the course. AUGEO 301 is classified as a science course.

#### **AUGEO 302 Directed Reading**

★3 (fi 6) (either term, 1-0-0). Supervised research project and intensive study of a specific area of geography as defined by the student and a supervising instructor. Prerequisite: ★6 in Geography. Admission to the course normally requires a minimum GPA of 3.0 in Geography. An "Application for Individual Study" must be completed and approved before registration in the course. AUGEO 302 is classified as an arts course.

#### **AUGEO 320 Parks and Wilderness**

★3 (fi 6) (either term, 3-0-0). Examination of scientific principles and concepts underlying parks, wilderness, and other protected area systems with emphasis on Canada. Topics include history, philosophy, conceptual frameworks, roles in sustainability, and types of biological and geographical designations. Prerequisite: One of AUBIO 253, AUENV 120, AUGEO 120, consent of the instructor. Note: Credit may be obtained for only one of AUGEO 320, 420, AUENV 320, 420.

#### **AUGEO 324 Resource and Environmental Management**

★3 (fi 6) (either term, 3-0-0). Integration of both physical and human phenomena in understanding natural resources, their dimensions and boundaries. Basic concepts in resource analysis and management are explored: the decision making process, management frameworks and strategies, legislation and regulation, impact assessment, the role of perceptions, attitudes and behaviour, and the impact of public participation/interest groups in the development of natural resources. Prerequisite: One of AUBIO 253, AUENV 120, AUGEO 120, 230, 231, consent of the instructor. Note: Credit may be obtained for only one of AUGEO 324 and AUENV 324.

#### **AUGEO 341 Geography of the Canadian North**

★3 (fi 6) (either term, 3-0-0). Examination of the biophysical environments, resources, economics, and settlements of northern regions of Canada. Prerequisites: One of AUPED 184, 286; ★3 in Geography and consent of the instructor. Notes: This course is intended to be taken in sequence with AUGEO 343 or AUPED 388. Credit may be obtained for only one of AUGEO 341, 342, and AUPED 387. AUGEO 341 is classified as an arts course.

#### **AUGEO 342 Geography of the Canadian North**

★3 (fi 6) (either term, 3-0-0). Examination of the biophysical environments, resources, economics, and settlements of northern regions of Canada. Prerequisites: One of AUPED 184, 286; ★3 in Geography and consent of the instructor. Notes: This course is intended to be taken in sequence with AUGEO 343 or AUPED 388. Credit may be obtained for only one of AUGEO 341, 342, and AUPED 387. AUGEO 342 is classified as a science course.

#### **AUGEO 343 Expedition in the Canadian North**

★3 (fi 6) (Spring/Summer, variable). Examination, involving a three- to four-week expedition in the summer, of the biophysical environments, resources, economics, and settlements of northern regions of Canada. Prerequisites: AUGEO 341, 342 or AUPED 387, and consent of the instructor(s). Notes: Expedition costs, as well as course tuition, are the student's responsibility. Credit may be obtained for only one of AUGEO 343 and AUPED 388.

#### **AUGEO 351 Biogeography**

★3 (fi 6) (either term, 3-0-3). Analysis of the spatial patterns of biotic systems and species. The course examines their past and present distribution patterns in the context of biological and ecological processes and human impacts. The course employs several methods of analysis, including geographic information systems. Prerequisite: AUBIO 253. Note: Credit may be obtained for only one of AUGEO 351 and AUBIO 351.

#### **AUGEO 354 Freshwater Ecology and Management**

★3 (fi 6) (first term, 3-0-3). Introduction to the biological, chemical and physical features of freshwater ecosystems, and how they relate to ecological processes in and adjacent to aquatic systems. The course will examine the role of ecological patterns in lakes, ponds, rivers and streams, with an emphasis on freshwater systems and their management in western Canada. Prerequisite: AUBIO 253. Notes: Credit may be obtained for only one of AUGEO 354, AUBIO 354, and AUENV 354. The course requires participation in a field trip.

#### **AUGEO 401 Directed Studies**

★3 (fi 6) (either term, 1-0-3). Supervised research project and intensive study of a specific area of geography as defined by the student and a supervising instructor. Prerequisite: ★6 in science Geography. Notes: Admission to the course normally requires a minimum GPA of 3.0 in Geography. An "Application for Individual Study" must be completed and approved before registration in the course. AUGEO 401 is classified as a science course.

#### **AUGEO 402 Directed Reading**

★3 (fi 6) (either term, 1-0-0). Supervised research project and intensive study of a specific area of geography as defined by the student and a supervising instructor. Prerequisite: ★6 in Geography. Notes: Admission to the course normally requires a minimum GPA of 3.0 in Geography. An "Application for Individual Study" must be completed and approved before registration in the course. AUGEO 402 is classified as an arts course.

#### **AUGEO 410 Selected Topics in Geography**

★3 (fi 6) (either term, 3-0-0). Advanced study of a selected topic in geography. Focus and content of each course are determined by student and faculty interests, and vary from year to year. Prerequisites: Third-year standing or consent of the instructor; previous course(s) in Geography and other disciplines as determined by the instructor.

#### **AUGEO 420 Parks and Wilderness**

★3 (fi 6) (either term, 3-0-0). Examination of scientific principles and concepts underlying parks, wilderness, and other protected area systems with emphasis on Canada. Topics include history, philosophy, conceptual frameworks, roles in sustainability, and types of biological and geographical designations. Prerequisite: One of AUBIO 253, AUENV 120, AUGEO 120; and one of AUBIO 350, 351, 353, 359, 450, 459, AUENV 324, 350, 351, 353, 359, 450, 459, AUGEO 324. Note: Credit may be obtained for only one of AUGEO 320, 420, AUENV 320, 420.

#### **AUGEO 421 Environmental Science: History and Impacts**

★3 (fi 6) (either term, 3-0-0). Overview of the historical developments, past and current impacts, and changing roles of the field of environmental science. Prerequisites: One of AUBIO 350, 353, 450; AUENV 320, 324, 350, 353, 450; AUGEO 320, 324 and at least fourth-year standing. Note: Credit may be obtained for only one of AUGEO 421 and AUENV 421.

#### **AUGEO 425 Environmental Impact Assessment**

★3 (fi 6) (either term, 3-0-0). History and theory of environmental impact assessment; legislative and policy frameworks; role in resource planning; methods and techniques for the assessment of impacts; future directions. Prerequisites: One of AUENV 324, AUGEO 324, and AUBIO 253. Note: Credit may be obtained for only one of AUENV 425, 325 (2009), AUGEO 325 (2009), 425.

## 231.39 Augustana Faculty - German, AUGER

Department of Humanities  
Augustana Faculty

### Undergraduate Courses

#### **AUGER 101 Beginners' German I**

★3 (fi 6) (first term, 4-0-0). German 101 and 102 are designed to develop ability in reading and writing German, with a strong emphasis on the development of comprehension and oral communication skills. During this process, the student participates in a wide variety of interactive activities and is also exposed to contemporary culture of German-speaking countries. These two courses not only encourage the student to think critically about the principles of grammar as they relate to the German language, but also stimulate an in-depth understanding of the principles by which language functions in general. These two courses also lead the student through the steps of reflective learning as he or she considers and discusses language learning strategies. Notes: The course is not open to a student with credit in German 30. AUGER 101 does not count toward the major in Modern Languages or the minor in German.

#### **AUGER 102 Beginners' German II**

★3 (fi 6) (second term, 4-0-0). Continuation of AUGER 101. Prerequisite: AUGER 101. Notes: The course is not open to a student with credit in German 30. AUGER 102 does not count toward the major in Modern Languages or the minor in German.

#### **AUGER 200 Intermediate German I and II**

★6 (fi 12) (Spring/Summer, variable). Intensive course designed to develop further the comprehension, speaking, writing, reading skills acquired in Beginners' German through classroom instruction, excursions, and immersion experience, including living in a German home. Improvement in overall fluency, enhanced knowledge of the culture of the German-speaking countries and review of key grammatical concepts are integral to the course. Prerequisite: One of AUGER 102, demonstration of AUGER 102 equivalency by means of a placement exam administered by the instructor, one year Beginners' German at a Canadian university. Note: Credit may be obtained for only one of AUGER 200, 201, 202. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **AUGER 201 Intermediate German I**

★3 (fi 6) (first term, 4-0-0). Designed to develop fluency in speaking, with emphasis on comprehension and writing skills. The essential rules of grammar are studied. Prerequisite: One of AUGER 102, demonstration of AUGER 102 equivalency by means of a placement examination administered by the instructor. Note: Credit may be obtained for only one of AUGER 200, 201.

#### **AUGER 202 Intermediate German II**

★3 (fi 6) (second term, 4-0-0). Continuation of AUGER 201. Prerequisite: AUGER 201. Note: Credit may be obtained for only one of AUGER 202, 200.

**AUGER 210 German Studies and Information Literacy**

★1 (*fi 2*) (either term, 1-0-0). Introduction to library research skills in the discipline of German. Prerequisite: Second-year standing in a Modern Languages degree program. Corequisite: Any senior course in German that requires library research. Notes: The corequisites must be taken concurrently. Credit may be obtained for only one of AUGER 210, AUENG 204, AUDRA 228, AUFRE 210, AUSCA 210.

**AUGER 214 German Media Language: Comprehension and Translation**

★3 (*fi 6*) (either term, 3-1s-0). Intensive course in German media language acquisition through aural, visual, and written comprehension and translation exercises. Translation includes lyrics and radio plays (on cassettes) and videos on German/European history, geography, political science, economics, and philosophy. Prerequisite: AUGER 202.

**AUGER 230 Selected Topics in German Language**

★3 (*fi 6*) (either term, 3-0-0). Study of selected topics in German language studies. Focus and content of each course will vary from year to year.

**AUGER 231 German Culture and Civilization I**

★3 (*fi 6*) (either term, 3-0-0). Introduction to German culture and civilization, taught in English. Major cultural trends and movements from early times to 1800 are studied. Notes: The course does not count toward the minor in German or the major in Modern Languages. Credit may be obtained for only one of AUGER 231 and 233.

**AUGER 233 German Culture and Civilization I**

★3 (*fi 6*) (either term, 3-0-0). Introduction to German culture and civilization, taught in English. Major cultural trends and movements from early times to 1800 are studied. All assignments for the course are submitted in German. Prerequisite: AUGER 302. Note: Credit may be obtained for only one of AUGER 233 and 231.

**AUGER 235 Selected Topics in German Language**

★3 (*fi 6*) (either term, 3-0-0). Study of selected topics in German language studies. Focus and content of each course will vary from year to year.

**AUGER 236 German Culture and Civilization II**

★3 (*fi 6*) (either term, 3-0-0). Introduction to German culture and civilization, taught in English. Major cultural trends and movements from 1800 to the present time are studied. Notes: The course does not count toward the minor in German or the major in Modern Languages. Credit may be obtained for only one of AUGER 236 and 238.

**AUGER 237 Selected Topics in German Literature**

★3 (*fi 6*) (either term, 3-0-0). Study of selected topics in German literature. Focus and content of each course will vary from year to year.

**AUGER 238 German Culture and Civilization II**

★3 (*fi 6*) (either term, 3-0-0). Introduction to German culture and civilization, taught in English. Major cultural trends and movements from 1800 to the present time are studied. All assignments for the course are submitted in German. Prerequisite: AUGER 200 or 202. Note: Credit may be obtained for only one of AUGER 238 and 236.

**AUGER 239 Selected Topics in German Literature**

★3 (*fi 6*) (either term, 3-0-0). Study of selected topics in German literature. Focus and content of each course will vary from year to year.

**AUGER 291 German Drama in Translation**

★3 (*fi 6*) (either term, 3-0-0). Analysis of German drama in English translation from the eighteenth century to the present.

**AUGER 292 German Fiction in Translation**

★3 (*fi 6*) (either term, 3-0-0). Analysis of German prose fiction in English translation from the eighteenth century to the present.

**AUGER 293 Women and German Literature in Translation**

★3 (*fi 6*) (either term, 3-0-0). Analysis of German literature in English translation written by women, and the role of women in German literature in general. Feminist literary theory is employed to analyze the texts.

**AUGER 300 Advanced German I and II**

★6 (*fi 12*) (Spring/Summer, variable). Intensive course designed to develop further the comprehension, speaking, writing, reading skills acquired in Intermediate German through classroom instruction, excursions, and immersion experience, including living in a German home. Improvement in overall fluency, enhanced knowledge of the culture of the German-speaking countries and review of key grammatical concepts are integral to the course. Prerequisite: AUGER 200 or 202; or two years of German study at a Canadian university, including one year Beginners' level and one year Intermediate level. Note: Credit may be obtained for only one of AUGER 300, 301 and 302. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**AUGER 301 Advanced German I**

★3 (*fi 6*) (first term, 4-0-0). Thorough review of German grammar and study of refined stylistics and idioms as represented in selections of twentieth-century short stories. Colloquial expressions presently in use are studied through discussion

and audiovisual presentation. Prerequisite: AUGER 200 or 202. Note: Credit may be obtained for only one of AUGER 301, 300.

**AUGER 302 Advanced German II**

★3 (*fi 6*) (second term, 4-0-0). Continuation of AUGER 301. Prerequisite: AUGER 301. Note: Credit may be obtained for only one of AUGER 302, 300.

**AUGER 313 Advanced German Grammar and Stylistics: Journalistic Literature**

★3 (*fi 6*) (either term, 3-0-1.5). Theoretical and practical study of the more complex areas of grammar, style, and idiomatic usage in journalistic writings. Emphasis is on contemporary media language. Prerequisite: AUGER 301 or consent of the instructor.

**AUGER 314 Advanced Translation**

★3 (*fi 6*) (either term, 3-0-0). Theory and practice of translation of texts in contemporary German writing. Prerequisite: AUGER 302.

**AUGER 317 Business German**

★3 (*fi 6*) (either term, 3-0-0). Study of the German language (oral and written) as used in the German business milieu and in the administrative sector. The student is introduced to the technical vocabulary required to function competently in situations revolving around business life. Prerequisite: AUGER 302 or consent of the instructor.

**AUGER 321 Survey of Literary Periods I**

★3 (*fi 6*) (either term, 3-0-0). Introduction to German literary periods from the beginning of recorded German literature to the Romantic period (ca. 1800). Prerequisite: AUGER 300 or 301. Corequisite: AUGER 302.

**AUGER 322 Survey of Literary Periods II**

★3 (*fi 6*) (either term, 3-0-0). Introduction to German literary periods from "Biedermeier" (ca. 1830) to the present. Prerequisite: AUGER 300 or 301. Corequisite: AUGER 302.

**AUGER 334 Selected Topics in German Language**

★3 (*fi 6*) (either term, 3-0-0). Study of selected topics in German language studies. Focus and content of each course will vary from year to year.

**AUGER 335 Selected Topics in German Language**

★3 (*fi 6*) (either term, 3-0-0). Study of selected topics in German language studies. Focus and content of each course will vary from year to year.

**AUGER 337 Selected Topics in German Literature**

★3 (*fi 6*) (either term, 3-0-0). Study of selected topics in German literature. Focus and content of each course will vary from year to year.

**AUGER 339 Selected Topics in German Literature**

★3 (*fi 6*) (either term, 3-0-0). Study of selected topics in German literature. Focus and content of each course will vary from year to year.

**AUGER 351 Eighteenth-Century Literature**

★3 (*fi 6*) (either term, 3-0-0). Analysis of selected representative works by poets of the following literary periods: Enlightenment, "Empfindsamkeit", "Sturm und Drang", classicism, and romanticism. Prerequisite: AUGER 300 or 301. Corequisite: AUGER 302.

**AUGER 361 Nineteenth-Century Literature**

★3 (*fi 6*) (either term, 3-0-0). Analysis of selected representative works of Biedermeier, realism, and naturalism. Prerequisite: AUGER 300 or 301. Corequisite: AUGER 302.

**AUGER 371 Twentieth-Century Literature**

★3 (*fi 6*) (either term, 3-0-0). Analysis of selected representative works by writers of the following periods: expressionism, post-World War I, World War II, up to the end of the century. Prerequisite: AUGER 300 or 301. Corequisite: AUGER 302

**AUGER 400 Advanced German III and IV**

★6 (*fi 12*) (Spring/Summer, variable). Intensive course designed to develop further the comprehension, speaking, writing, reading skills acquired in Advanced German through classroom instruction, excursions, and immersion experience, including living in a German home. Improvement in overall fluency, enhanced knowledge of the culture of the German-speaking countries and review of key grammatical concepts are integral to the course. Prerequisite: AUGER 300 or 302; or three years of German study at a Canadian university, including one year Beginners' level, one year Intermediate level and one year Advanced level. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**AUGER 401 Selected Topics in German Literature**

★3 (*fi 6*) (either term, 1-0-0). Content varies from year to year, but in general it introduces a specific literary period, or the selected works of some prominent authors who are significant because of their role in the emergence of a new literary genre or a new philosophy. Prerequisite: One of AUGER 300, 302, or 313, consent of the instructor.

**AUGER 402 Directed Study: Translation Techniques**

★3 (*fi 6*) (either term, 1.5-0-0). Intensive study in translation techniques (German-

English, English-German). Specific literature (e.g., reports, sermons, essays, philosophical or business writings) is chosen by the student and a supervising instructor. Prerequisites: AUGER 302 and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

#### **AUGER 403 Directed Reading**

★3 (*fi 6*) (either term, 1.5-0-0). Intensive study of a specific area of German as defined by the student and a supervising instructor. Prerequisites: AUGER 322 and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

## 231.40 Augustana Faculty - Global and Development Studies, AUGDS

Department of Social Sciences  
Augustana Faculty

### Undergraduate Courses

#### **AUGDS 103 Introduction to Global and Political Studies**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the ideas and key concepts that comprise the vocabulary of global and political studies. The course considers such ideas as democracy, order, power, authority, justice, freedom, development, globalization and equality. Notes: Credit may be obtained for only one of AUGDS 103 and AUPOL 103.

#### **AUGDS 122 Development Studies Seminar (México)**

★6 (*fi 12*) (either term, 0-6s-0). Integrative study of development issues and strategies based on work experiences in rural communities in an African, Asian, or Latin American country (currently México). Prerequisite: Consent of the selection committee. Credit may be obtained for only one of AUGDS 122, 222, 322, AUIDS 122 (2009), 222 (2009), 322 (2009), AUSPA 240, 340.

#### **AUGDS 123 Development Studies Practicum (México)**

★3 (*fi 6*) (either term, 0-0-6). By working in an African, Asian, or Latin American country (currently México) in projects dealing with such issues as health care, water aid, sustainable farming, developing co-operatives, and education, the student becomes familiar with various aspects of an integrated approach to development. Prerequisite: Consent of the selection committee. Note: Credit may be obtained for only one of AUGDS 123, 223, 323, AUIDS 123 (2009), 223 (2009), 323 (2009), AUSPA 241, 341.

#### **AUGDS 124 Development Studies Seminar (Canada)**

★6 (*fi 12*) (first term, 0-6s-0). Integrative study of development issues and strategies based on work experiences in rural communities in Canada. Prerequisite: Consent of the selection committee. Credit may be obtained for only one of AUGDS 124, 224, 324, AUIDS 124 (2009), 224 (2009), 324 (2009).

#### **AUGDS 125 Development Studies Practicum (Canada)**

★3 (*fi 6*) (first term, 0-0-6). By working in Canada in development projects dealing with such issues as health care, water aid, sustainable farming, developing cooperatives, and education, the student becomes familiar with various aspects of an integrated approach to development. Prerequisite: Consent of the selection committee.

#### **AUGDS 222 Development Studies Seminar (México)**

★6 (*fi 12*) (either term, 0-6s-0). Integrative study of development issues and strategies based on work experiences in rural communities in an African, Asian, or Latin American country (currently México). Prerequisite: Consent of the selection committee. Note: Credit may be obtained for only one of AUGDS 122, 222, 322, AUIDS 122 (2009), 222 (2009), 322 (2009), AUSPA 240, 340.

#### **AUGDS 223 Development Studies Practicum (México)**

★3 (*fi 6*) (either term, 0-0-6). By working in an African, Asian, or Latin American country (currently México) in projects dealing with such issues as health care, water aid, sustainable farming, developing co-operatives, and education, the student becomes familiar with various aspects of an integrated approach to development. Prerequisite: Consent of the selection committee. Note: Credit may be obtained for only one of AUGDS 123, 223, 323, AUIDS 123 (2009), 223 (2009), 323 (2009), AUSPA 241, 341.

#### **AUGDS 224 Development Studies Seminar (Canada)**

★6 (*fi 12*) (first term, 0-6s-0). Integrative study of development issues and strategies based on work experiences in rural communities in Canada. Prerequisite: Consent of the selection committee. Credit may be obtained for only one of AUGDS 124, 224, 324, AUIDS 124 (2009), 224 (2009), 324 (2009).

#### **AUGDS 225 Development Studies Practicum (Canada)**

★3 (*fi 6*) (first term, 0-0-6). By working in Canada in development projects dealing with such issues as health care, water aid, sustainable farming, developing cooperatives, and education, the student becomes familiar with various aspects of an integrated approach to development. Prerequisite: Consent of the selection committee.

#### **AUGDS 322 Development Studies Seminar (México)**

★6 (*fi 12*) (either term, 0-6s-0). Integrative study of development issues and strategies based on work experiences in rural communities in an African, Asian, or Latin American country (currently México). Prerequisite: Consent of the selection committee. Notes: Credit may be obtained for only one of AUGDS 122, 222, 322, AUIDS 122 (2009), 222 (2009), 322 (2009), AUSPA 240, 340.

#### **AUGDS 323 Development Studies Practicum (México)**

★3 (*fi 6*) (either term, 0-0-6). By working in an African, Asian, or Latin American country (currently México) in projects dealing with such issues as health care, water aid, sustainable farming, developing co-operatives, and education, the student becomes familiar with various aspects of an integrated approach to development. Prerequisite: Consent of the selection committee. Note: Credit may be obtained for only one of AUGDS 123, 223, 323, AUIDS 123 (2009), 223 (2009), 323 (2009), AUSPA 241, 341.

#### **AUGDS 325 Development Studies Practicum (Canada)**

★3 (*fi 6*) (first term, 0-0-6). By working in Canada in development projects dealing with such issues as health care, water aid, sustainable farming, developing cooperatives, and education, the student becomes familiar with various aspects of an integrated approach to development. Prerequisite: Consent of the selection committee.

#### **AUGDS 427 Senior Global and Development Studies Research Seminar I**

★3 (*fi 6*) (either term, 3-0-0). Preparation of a literature review, and research proposal, and presentation. Research may be participatory, qualitative, quantitative, archival, community-based, and may include a practical component. Classes will provide supportive and critical analysis throughout students research process and examine issues, theories, and practices central to global and development studies and social change. This course integrates the varied disciplinary approaches and practices experienced throughout the program. Prerequisite: Third or fourth-year standing. Only open to majors in IDS-Global and Development Studies. Note: This course can only be taken by students also registered in AUGDS 428. Credit may be obtained for only one of AUGDS 427 and AUIDS 427 (2009).

#### **AUGDS 428 Senior Global and Development Studies Research Seminar II**

★3 (*fi 6*) (either term, 3-0-0). Continuation of AUGDS 427. This course involves implementing research, presentation of results, and a final project. Research may be participatory, qualitative, quantitative, archival, community-based, and may include a practical component. Classes will provide supportive and critical analysis throughout students research process and examine issues, theories, and practices central to global and development studies and social change. This course integrates the varied disciplinary approaches and practices experienced throughout the program. Prerequisites: AUGDS 427 and third or fourth-year standing. Only open to majors in AUIDS-Global and Development Studies. Note: Credit may be obtained for only one of AUGDS 428 and AUIDS 428 (2009).

## 231.41 Augustana Faculty - Greek, AUGRE

Department of Humanities  
Augustana Faculty

### Undergraduate Courses

#### **AUGRE 101 Beginners' Hellenistic Greek I**

★3 (*fi 6*) (first term, 4-0-0). Introduction to the basic grammar and vocabulary of Hellenistic Greek.

#### **AUGRE 102 Beginners' Hellenistic Greek II**

★3 (*fi 6*) (second term, 4-0-0). Continuation of AUGRE 101. Prerequisite: AUGRE 101.

#### **AUGRE 203 Intermediate Greek I (Hellenistic)**

★3 (*fi 6*) (either term, 3-0-0). Readings in the Hellenistic Greek of the New Testament, Septuagint, Apostolic Fathers, and other Hellenistic works. Review of Greek grammar. Prerequisite: AUGRE 102.

#### **AUGRE 204 Intermediate Greek II (Classical)**

★3 (*fi 6*) (either term, 3-0-0). Selected readings in classical Greek literature. Classical Greek is introduced through prose composition. Prerequisite: AUGRE 203.

#### **AUGRE 298 Directed Reading I**

★3 (*fi 6*) (either term, 1.5-0-0). Readings from a specific area of Hellenistic or classical Greek to be defined by the student and a supervising instructor. Prerequisites: AUGRE 203 for Hellenistic Greek texts, AUGRE 204 for classical Greek texts, and consent of the instructor. An "Application for Individual Study" must be completed and approved before registration in each of these courses.

#### **AUGRE 299 Directed Reading II**

★3 (*fi 6*) (either term, 1.5-0-0). Readings from a specific area of Hellenistic or classical Greek to be defined by the student and a supervising instructor. Prerequisites: AUGRE 203 for Hellenistic Greek texts, AUGRE 204 for classical Greek texts, and consent of the instructor. An "Application for Individual Study" must be completed and approved before registration in each of these courses.



**AUGRE 303 Directed Reading III**

★3 (fi 6) (either term, 1.5-0-0). Readings from a specific area of Hellenistic or classical Greek as defined by the student and a supervising instructor. Prerequisites: AUGRE 298 for Hellenistic Greek texts, AUGRE 299 for classical Greek texts, and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUGRE 304 Directed Reading IV**

★3 (fi 6) (either term, 1.5-0-0). Readings from a specific area of Hellenistic or classical Greek as defined by the student and a supervising instructor. Prerequisites: AUGRE 298 for Hellenistic Greek texts, AUGRE 299 for classical Greek texts, and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUGRE 305 Directed Reading V**

★3 (fi 6) (either term, 1.5-0-0). Readings from a specific area of Hellenistic or classical Greek as defined by the student and a supervising instructor. Prerequisites: AUGRE 298 for Hellenistic Greek texts, AUGRE 299 for classical Greek texts, and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUGRE 306 Directed Reading VI**

★3 (fi 6) (either term, 1.5-0-0). Readings from a specific area of Hellenistic or classical Greek as defined by the student and a supervising instructor. Prerequisites: AUGRE 298 for Hellenistic Greek texts, AUGRE 299 for classical Greek texts, and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUGRE 307 Directed Reading VII**

★3 (fi 6) (either term, 1.5-0-0). Readings from a specific area of Hellenistic or classical Greek as defined by the student and a supervising instructor. Prerequisites: AUGRE 298 for Hellenistic Greek texts, AUGRE 299 for classical Greek texts, and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUGRE 308 Directed Reading VIII**

★3 (fi 6) (either term, 1.5-0-0). Readings from a specific area of Hellenistic or classical Greek as defined by the student and a supervising instructor. Prerequisites: AUGRE 298 for Hellenistic Greek texts, AUGRE 299 for classical Greek texts, and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUGRE 309 Directed Reading IX**

★3 (fi 6) (either term, 1.5-0-0). Readings from a specific area of Hellenistic or classical Greek as defined by the student and a supervising instructor. Prerequisites: AUGRE 298 for Hellenistic Greek texts, AUGRE 299 for classical Greek texts, and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUGRE 310 Directed Reading X**

★3 (fi 6) (either term, 1.5-0-0). Readings from a specific area of Hellenistic or classical Greek as defined by the student and a supervising instructor. Prerequisites: AUGRE 298 for Hellenistic Greek texts, AUGRE 299 for classical Greek texts, and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

## 231.42 Augustana Faculty - History, AUHIS

Department of Social Sciences  
Augustana Faculty

### Undergraduate Courses

**AUHIS 104 World History: The West**

★3 (fi 6) (either term, 3-0-0). Introduction to understanding our world: aspects of European, North American, and Islamic history.

**AUHIS 105 World History: The East and the South**

★3 (fi 6) (either term, 3-0-0). Introduction to understanding our world: aspects of Asian, African, and Latin American history.

**AUHIS 190 The Historian's Craft: Research Skills and Tools**

★3 (fi 6) (either term, 3-0-0). Introduction to the skills and methods needed for the study of history. The course familiarizes students with the specialized vocabulary of the discipline. It guides students through all the steps necessary to write a research paper: the choice and delineation of a research topic, the elaboration of the thesis, the collection of data and the treatment of the information, the outline and the writing of the paper. Note: This course is only open to students with a major or a minor in History.

**AUHIS 201 European History I: Fall of the Roman Empire to the French Revolution**

★3 (fi 6) (either term, 3-0-0). Major themes in the development of European

society from the fall of the Roman Empire in the West to the eve of the French Revolution.

**AUHIS 202 European History II: French Revolution to the Present**

★3 (fi 6) (either term, 3-0-0). Survey of the social, political, and military history of Europe from the French Revolution to the present. Topics include the causes and results of revolutions, strategy and diplomacy of the two World Wars, and the emergence of a new postwar Europe.

**AUHIS 203 History of Ancient Greece I**

★3 (fi 6) (either term, 3-0-0). History of Greece from the Bronze Age to the Persian Wars. Note: Credit may be obtained for only one of AUHIS 203 and AUCLA 221.

**AUHIS 204 History of Ancient Greece II**

★3 (fi 6) (either term, 3-0-0). History of Greece from the Persian Wars to the end of the Hellenistic Age. Note: Credit may be obtained for only one of AUHIS 204 and AUCLA 222.

**AUHIS 207 History of the Roman Republic**

★3 (fi 6) (either term, 3-0-0). History of the Roman Republic from its beginnings to the Battle of Actium in 31 B.C. Note: Credit may be obtained for only one of AUHIS 207 and AUCLA 223.

**AUHIS 208 History of the Roman Empire**

★3 (fi 6) (either term, 3-0-0). History of the Roman Empire from the time of Augustus to the fall of the West in the fifth century A.D. Note: Credit may be obtained for only one of AUHIS 208 and AUCLA 224.

**AUHIS 212 Sport, Physical Activity, and the Body: Historical Perspectives**

★3 (fi 6) (either term, 3-0-0). Examination of major themes in the history of sport, physical activity, and the body. Beginning with the ancient civilizations of Greece and Rome, the course explores the social, cultural, political, philosophical, religious, and economic factors that have influenced sport, physical education, and attitudes toward the body in various time periods. Note: Credit may be obtained for only one of AUHIS 212 and AUPED 262.

**AUHIS 242 British History to 1688**

★3 (fi 6) (either term, 3-0-0). Introduction to the salient features of British history from the Roman conquest to 1688.

**AUHIS 243 British History since 1688**

★3 (fi 6) (either term, 3-0-0). Introduction to the salient features of British history from 1688 to the present.

**AUHIS 250 United States History to 1865**

★3 (fi 6) (either term, 3-0-0). Survey of the social, political, and military history of the United States from Colonial times to the Civil War. Topics include European settlement, the War of Independence, making a new country, westward expansion, slavery, and the disruption of the Union.

**AUHIS 251 United States History since 1865**

★3 (fi 6) (either term, 3-0-0). Survey of the social, political, and military history of the United States from the Civil War to the present. Topics include Reconstruction, industrial and economic development, Indian wars, the Great Depression, World Wars and the Cold War, and early twenty-first century American exceptionalism.

**AUHIS 260 An Introduction to the Study of Canadian History to 1867**

★3 (fi 6) (either term, 3-0-0). Canada's political, social and economic development from life before European Contact to Confederation. Lectures, assigned readings, films and discussions will provide factual background on Canadian history and stimulate critical thinking.

**AUHIS 261 An Introduction to the Study of Canadian History, 1867 to the Present**

★3 (fi 6) (either term, 3-0-0). Political, social, economic and cultural questions of Canada since 1867. Taking a thematic approach, lectures, assigned readings, films and discussions will provide factual background on Canadian history and stimulate critical thinking.

**AUHIS 262 History of Canadian Economic Development**

★3 (fi 6) (either term, 3-0-0). Survey of Canada's economic development from before Confederation until the present. Note: Credit may be obtained for only one of AUHIS 262 and AUCEO 251.

**AUHIS 271 The History of Women in Canadian Society**

★3 (fi 6) (either term, 3-0-0). History of Canadian women from the seventeenth century to the present, looking at how Canadian women were affected by, and how they contributed to, changes in Canadian society. Corequisite: AUHIS 260 or 261 or consent of the instructor.

**AUHIS 285 Historical Studies and Information Literacy**

★1 (fi 2) (either term, 1-0-0). Introduction to library research skills in the discipline of History. Prerequisite: Second year standing in a History degree program. Corequisite: Any senior course in History that requires library research. Notes: The corequisites must be taken concurrently. Credit may be obtained for only one of AUHIS 285, AUART 228, AUPHI 228, AUREL 228.

**AUHS 291 Cuban History Since 1895**

★3 (fi 6) (second term, 3-0-0). Study of Cuban history from the War of Independence (1895-1898) to the present. Note: Credit may be obtained for only one of AUSPA 251 and AUHS 291. The course is available only as part of the Augustana-in-Cuba Program.

**AUHS 312 The Modern Olympic Games**

★3 (fi 6) (either term, 3-0-0). Examination of the historical development of the modern Olympic Games. Topics include politics, nationalism, culture, commercialism, media, gender, race and identity. Note: Credit may be obtained for only one of AUHS 312 and AUPED 369.

**AUHS 316 Europe in the Eighteenth Century**

★3 (fi 6) (either term, 3-0-0). Royal absolutism from Russia to France, the Enlightenment, and the French Revolution. Prerequisite: None, but AUHS 201 and 202 would be useful.

**AUHS 322 Nineteenth-Century Europe to 1849**

★3 (fi 6) (either term, 3-0-0). Restoration, liberalism, nationalism, and revolution. Prerequisite: None, but AUHS 202 would be useful.

**AUHS 323 Nineteenth-Century Europe since 1849**

★3 (fi 6) (first term, 3-0-0). Industrialization and modernization of continental Europe; origins of World War I. Prerequisite: None, but AUHS 202 would be useful.

**AUHS 325 Twentieth-Century Europe**

★6 (fi 12) (two term, 3-0-0). Social, economic, national, intellectual, and military development of Europe from World War I to the end of the twentieth century. Prerequisite: None, but AUHS 202 would be useful. Note: Credit may be obtained for only one of AUHS 325 and 425.

**AUHS 328 Germany since Frederick the Great**

★3 (fi 6) (either term, 3-0-0). Survey of modern German history from Frederick the Great (1740) to the defeat of Hitler in 1945.

**AUHS 329 Topics in the History and Culture of Southern France**

★3 (fi 6) (either term, 3-0-0). Aspects of the social, political and religious history, as well as the arts, architecture and literature of Southern France. All lectures and readings are in English. Note: Credit may be obtained for only one of AUHS 329 and AUFRE 307.

**AUHS 332 Eastern Europe since World War I**

★3 (fi 6) (either term, 3-0-0). Independent East European states, Nazi domination, Soviet conquest, "real-socialism." Prospects for the future are considered.

**AUHS 333 Tour of Southern France**

★2 (fi 4) (Spring/Summer, variable). Tour of Southern France: History and culture. To complement the topics covered in AUHS 329. Prerequisite: AUHS 329. Notes: Enrolment limited to a maximum of 10 students. Credit may be obtained for only one of AUHS 333 and AUFRE 308. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**AUHS 337 History of the Soviet Union, 1917 to 1941**

★3 (fi 6) (either term, 3-0-0). Historical survey of Soviet domestic and foreign policy from 1917 to 1941.

**AUHS 338 History of the Soviet Union, 1941 to 1991**

★3 (fi 6) (either term, 3-0-0). Historical survey of Soviet domestic and foreign policy from 1941 to 1991.

**AUHS 347 The Industrial Revolution in Britain**

★3 (fi 6) (either term, 3-0-0). Intellectual, social, and economic history of Britain, ca. 1750 to 1850. Prerequisite: AUHS 243 or consent of the instructor.

**AUHS 356 History of the United States West**

★3 (fi 6) (either term, 3-0-0). Study of the western United States from the late eighteenth through the twentieth century. Special emphasis is given to the west's integration into the industrial and urban life of the nation. Prerequisite: AUHS 251 or consent of the instructor.

**AUHS 358 History of United States Foreign Relations to 1914**

★3 (fi 6) (either term, 3-0-0). Survey of United States foreign relations from 1774 to 1914, the problems of winning and maintaining independence, a century of expansion at home and overseas, Civil War diplomacy, the emergence of the United States as a world power. Prerequisite: AUHS 250 or consent of the instructor.

**AUHS 359 History of United States Foreign Relations since 1914**

★3 (fi 6) (either term, 3-0-0). Emphasis upon United States leadership in world affairs in the twentieth century, United States relations with the Far East and Latin America, the breakdown of neutrality in the two World Wars, the search for collective security. Prerequisite: AUHS 251 or consent of the instructor.

**AUHS 360 Selected Topics in Canadian History**

★3 (fi 6) (variable, 3-0-0). Seminar course which deals with selected topics in Canadian history. Topics vary from year to year. They are announced before registration. Subjects are selected from, but not limited to, politics, labour,

education, ideas, family, the legal system, regional issues, ethnicity. Prerequisite: One of AUHS 260, 261.

**AUHS 361 Selected Topics in Canadian History**

★3 (fi 6) (either term, 3-0-0). Seminar course which deals with selected topics in Canadian history. Topics vary from year to year. They are announced before registration. Subjects are selected from, but not limited to, politics, labour, education, ideas, family, the legal system, regional issues, ethnicity. Prerequisite: One of AUHS 260, 261.

**AUHS 362 Selected Topics in Canadian History**

★3 (fi 6) (either term, 3-0-0). Seminar course which deals with selected topics in Canadian history. Topics vary from year to year. They are announced before registration. Subjects are selected from, but not limited to, politics, labour, education, ideas, family, the legal system, regional issues, ethnicity. Prerequisite: One of AUHS 260, 261.

**AUHS 363 Selected Topics in Canadian History**

★3 (fi 6) (either term, 3-0-0). Seminar course which deals with selected topics in Canadian history. Topics vary from year to year. They are announced before registration. Subjects are selected from, but not limited to, politics, labour, education, ideas, family, the legal system, regional issues, ethnicity. Prerequisite: One of AUHS 260, 261.

**AUHS 366 History of The Canadian West**

★3 (fi 6) (either term, 3-0-0). Economic, political and social development of western Canada. The course will compare and contrast the Canadian West with the American West, discussing the two distinct western myths. The seminar starts with the First Peoples and concludes with an assessment of western Canadian regionalism and "alienation" in present day. Prerequisite: AUHS 261 or consent of the instructor.

**AUHS 368 History of Sport in Canada**

★3 (fi 6) (either term, 3-0-0). Examination of the history of sport in Canadian society, from colonial times to the present. The course links developments in sport to wider changes in Canadian society and social relations. Note: Credit may be obtained for only one of AUHS 368 and AUPED 368.

**AUHS 369 History of Canada's Aboriginal Peoples**

★3 (fi 6) (either term, 3-0-0). Examination of the history of Aboriginal Canada from the beginning of human occupation of what is now Canada to the present. Special attention is paid to the period after European contact, and to the relationship between Native peoples and the French, British, and Canadian governments. Prerequisite: One of AUHS 260, 261, consent of the instructor.

**AUHS 372 History of Quebec**

★3 (fi 6) (either term, 3-0-0). A general history of Quebec from the French Regime to the present-day. Lectures and tutorials will place particular emphasis on the development of French Canadian nationalism, and the relationship between Quebec and Canada. Prerequisite: AUHS 260 or 261.

**AUHS 375 Canadian Environmental History**

★3 (fi 6) (either term, 3-0-0). Historical examination of the dynamic interrelationships between the natural world and humans, with a focus on Canadian issues within a North American context. Topics and perspectives will include: Aboriginal peoples, colonization, fur trade, exploration, settlement, western agriculture, science, and the conservation movement. Note: Credit may be obtained for only one of AUHS 375, 475, AUENV 375, 475.

**AUHS 378 Twentieth-Century Canada**

★3 (fi 6) (either term, 3-0-0). Social, political, economic, and intellectual developments in twentieth-century Canada. Prerequisite: One of AUHS 260, 261, consent of the instructor.

**AUHS 401 Directed Reading I**

★3 (fi 6) (variable, 1-0-0). Intensive study of a specific area of history as defined by the student and a supervising instructor. Prerequisites: Fourth-year standing and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

**AUHS 402 Directed Reading II**

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of history as defined by the student and a supervising instructor. Prerequisites: AUHS 401 and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

**AUHS 416 Europe in the Sixteenth Century**

★3 (fi 6) (either term, 3-0-0). Intellectual and social history of the Renaissance and Reformation. Prerequisite: ★3 at a senior level in European history.

**AUHS 425 Twentieth-Century Europe**

★6 (fi 12) (two term, 3-0-0). Social, economic, national, intellectual, and military development of Europe from World War I to the end of the twentieth century. Prerequisite: ★9 in European history. Note: Credit may be obtained for only one of AUHS 425 and 325.

**AUHS 454 The United States Civil War Era, 1846 to 1877**

★3 (fi 6) (either term, 3-0-0). Political, military, and socio-economic history of

the United States Civil War: its causes, prosecution, and aftermath. Prerequisite: AUHIS 250.

#### **AUHIS 460 Selected Topics in Canadian History**

★3 (*fi 6*) (variable, 3-0-0). Seminar course which deals with selected topics in Canadian history. Topics vary from year to year. They are announced before registration. Subjects are selected from, but not limited to, politics, labour, education, ideas, family, the legal system, regional issues, ethnicity. Prerequisite: One of AUHIS 366, 369, 372, 378.

#### **AUHIS 461 Selected Topics in Canadian History**

★3 (*fi 6*) (either term, 3-0-0). Seminar course which deals with selected topics in Canadian history. Topics vary from year to year. They are announced before registration. Subjects are selected from, but not limited to, politics, labour, education, ideas, family, the legal system, regional issues, ethnicity. Prerequisite: One of AUHIS 366, 369, 372, 378.

#### **AUHIS 462 Selected Topics in Canadian History**

★3 (*fi 6*) (either term, 3-0-0). Seminar course which deals with selected topics in Canadian history. Topics vary from year to year. They are announced before registration. Subjects are selected from, but not limited to, politics, labour, education, ideas, family, the legal system, regional issues, ethnicity. Prerequisite: One of AUHIS 366, 369, 372, 378.

#### **AUHIS 463 Selected Topics in Canadian History**

★3 (*fi 6*) (either term, 3-0-0). Seminar course which deals with selected topics in Canadian history. Topics vary from year to year. They are announced before registration. Subjects are selected from, but not limited to, politics, labour, education, ideas, family, the legal system, regional issues, ethnicity. Prerequisite: One of AUHIS 366, 369, 372, 378.

#### **AUHIS 467 The Collaborative Research Seminar: Selected Topics in Canadian History**

★6 (*fi 12*) (two term, 3-0-0). This research seminar explores a field of Canadian history (to be determined by the professor). The course has three main components: critical reading and discussion of a specialized field of Canadian history writing, an historiographical research paper, as well as a collaborative research paper done from archival material and written jointly by members of the seminar. Prerequisites: AUHIS 260 and AUHIS 261.

#### **AUHIS 470 Selected Topics in Canadian Social History**

★3 (*fi 6*) (either term, 3-0-0). Senior-level seminar for those already possessing a general knowledge of Canadian social history. Prerequisite: ★3 at a senior level in Canadian history.

#### **AUHIS 475 Canadian Environmental History**

★3 (*fi 6*) (either term, 3-0-0). Historical examination of the dynamic interrelationships between the natural world and humans, with a focus on Canadian issues within a North American context. Topics and perspectives will include: Aboriginal peoples, colonization, fur trade, exploration, settlement, western agriculture, science, and the conservation movement. Prerequisite: One of AUHIS 260, 261. Note: Credit may be obtained for only one of AUHIS 375, 475, AUENV 375, 475.

#### **AUHIS 480 The Historian's Craft: Historiography**

★3 (*fi 6*) (variable, 3-0-0). How do historians do history? Problems of evidence, interpretation, methodologies, and various paradigms are investigated in the course as the student explores how historians research and write about the past. Prerequisite: ★6 in History.

## 231.43 Augustana Faculty - Interdisciplinary Studies, AUIDS

Department of Social Sciences  
Augustana Faculty

### Undergraduate Courses

#### **AUIDS 121 Introduction to Development Studies**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the political, economic, literary, cultural, gender, and spiritual aspects of development work and to various development paradigms. Note: Credit may be obtained for only one of AUIDS 121, 221 and AUSOC 218.

#### **AUIDS 160 Introduction to Crime, Correction, and Community**

★3 (*fi 6*) (either term, 3-0-0). Introduction to crime and correction in Canada. The theory and practice accompanying law enforcement, trial, correctional intervention, and probation and parole are analyzed by drawing from a range of disciplinary traditions such as ethical reflection, psychological theory, social and political thought, and biological understandings of criminality. Note: Credit may be obtained for only one of AUIDS 160 and AUCRI 160.

#### **AUIDS 221 Introduction to Development Studies**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the political, economic, literary,

cultural, gender, and spiritual aspects of development work and to various development paradigms. Note: Credit may be obtained for only one of AUIDS 121, 221 and AUSOC 218.

#### **AUIDS 230 Introduction to Women's Studies**

★3 (*fi 6*) (either term, 3-0-0). Survey and analysis of issues concerning women's lives, both historically and in the present; an account of the development of feminist theories and critiques, and an assessment of the contribution this new scholarship has made in transforming perceived knowledge in a variety of disciplines.

#### **AUIDS 260 Environmental Studies Practicum**

★3 (*fi 6*) (either term, 1-0-3). Practicum placement in a government, industry, or non-governmental organization to gain awareness and experience in an environmental field. Prerequisite: AUENV 120 or AUGEO 120. Notes: The course is open only to a student with a major in Environmental Studies/Science. Credit may be obtained for only one of AUIDS 260 and AUENV 260.

#### **AUIDS 270 Topics in Integrative Studies**

★3 (*fi 6*) (either term, 3-0-0). Selected topics on the integration of knowledge between different disciplinary perspectives. The focus and content of each course are determined by student and faculty interests, and vary from year to year. Each course is team-taught by faculty from at least two distinct disciplines. Note: Even-numbered courses in this series are classified as arts courses; odd-numbered courses are classified as science courses. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **AUIDS 276 Topics in Integrative Studies**

★3 (*fi 6*) (either term, 3-0-0). Selected topics on the integration of knowledge between different disciplinary perspectives. The focus and content of each course are determined by student and faculty interests, and vary from year to year. Each course is team-taught by faculty from at least two distinct disciplines. Note: Even-numbered courses in this series are classified as arts courses; odd-numbered courses are classified as science courses.

#### **AUIDS 278 Topics in Integrative Studies**

★3 (*fi 6*) (two term, 1.5-0-0). Selected topics on the integration of knowledge between different disciplinary perspectives. The focus and content of each course are determined by student and faculty interests, and vary from year to year. Each course is team-taught by faculty from at least two distinct disciplines. Note: Even-numbered courses in this series are classified as arts courses; odd-numbered courses are classified as science courses.

#### **AUIDS 290 Directed Reading**

★3 (*fi 6*) (either term, 1-0-0). Intensive study of a specific area to be defined by the student and a supervising instructor. Prerequisite: Consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in one of these courses.

#### **AUIDS 291 Directed Reading**

★3 (*fi 6*) (either term, 1-0-0). Intensive study of a specific area to be defined by the student and a supervising instructor. Prerequisite: Consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in one of these courses.

#### **AUIDS 292 Integrative Studies (Cuba)**

★3 (*fi 6*) (second term, 3-0-0). This is a mandatory course for all students attending the Augustana in Cuba program. The course will integrate various disciplinary considerations with the student's experiences while living and studying for a semester in Cuba. Themes will include: Cuban society and culture, Cuba in a Latin American context, Cuba and the world. Note: Credit may be obtained for only one of AUIDS 292 and AUSPA 250. The course is available only as part of the Augustana-in-Cuba Program.

#### **AUIDS 378 Topics in Integrative Studies**

★3 (*fi 6*) (two term, 1.5-0-0). Selected topics on the integration of knowledge between different disciplinary perspectives. The focus and content of each course are determined by student and faculty interests, and vary from year to year. Each course is team-taught by faculty from at least two distinct disciplines. Note: Even-numbered courses in this series are classified as arts courses; odd-numbered courses are classified as science courses.

#### **AUIDS 390 Directed Reading**

★3 (*fi 6*) (either term, 1-0-0). Intensive study of a specific area to be defined by the student and a supervising instructor. Prerequisite: Consent of the instructor; at least third-year standing or ★3 at a senior level in Interdisciplinary Studies. Note: An "Application for Individual Study" must be completed and approved before registration in one of these courses.

#### **AUIDS 391 Directed Reading**

★3 (*fi 6*) (either term, 1-0-0). Intensive study of a specific area to be defined by the student and a supervising instructor. Prerequisite: Consent of the instructor; at least third-year standing or ★3 at a senior level in Interdisciplinary Studies. Note: An "Application for Individual Study" must be completed and approved before registration in one of these courses.



## 231.44 Augustana Faculty - Language Studies, AULAN

Department of Social Sciences  
Augustana Faculty

### Undergraduate Courses

#### AULAN 101 Introduction to Linguistic Analysis

★3 (fi 6) (first term, 3-0-0). Central concepts of linguistics: linguistic categories and structure (phonetics, phonology, morphology, syntax, semantics). Notes: May not be taken by students with credit in AULAN 200 (2010).

## 231.45 Augustana Faculty - Latin, AULAT

Department of Humanities  
Augustana Faculty

### Undergraduate Courses

#### AULAT 101 Beginners' Latin I

★3 (fi 6) (first term, 4-0-0). Introduction to the basic grammar and vocabulary of Latin.

#### AULAT 102 Beginners' Latin II

★3 (fi 6) (second term, 4-0-0). Continuation of AULAT 101. Prerequisite: AULAT 101.

#### AULAT 203 Intermediate Latin I

★3 (fi 6) (either term, 3-0-0). Selected readings in Latin literature. A review of Latin grammar. Prerequisite: AULAT 102.

#### AULAT 204 Intermediate Latin II

★3 (fi 6) (either term, 3-0-0). Selected readings in Latin literature. Prose composition. Prerequisite: AULAT 203.

## 231.46 Augustana Faculty - Management, AUMGT

Department of Social Sciences  
Augustana Faculty

### Undergraduate Courses

#### AUMGT 100 Introduction to Business

★3 (fi 6) (either term, 3-0-0). Survey of the competitive landscape of Canadian and Global businesses to provide students with the basic information about the different facets of business organizations.

#### AUMGT 200 Introduction to Management

★3 (fi 6) (either term, 3-0-0). Introduction to the basic concepts of management. Topics include the origins of management, functional areas of management, levels of management structure, relationship between structure and function of the organization. Prerequisite: AUMGT 100.

#### AUMGT 206 Mathematics in Economics and Finance

★3 (fi 6) (either term, 3-0-0). Mathematical analysis of problems arising in economics and finance, including an introduction to economic modelling, simple, compound, and continuous rates of interest; statics and comparative-static analysis; optimization; annuities, mortgages, bonds, and other securities; dynamics. Prerequisites: AUECO 101 and one of AUMAT 110, 111. Note: Credit may be obtained for only one of AUMGT 206, AUECO 206, AUMAT 235.

#### AUMGT 212 Business Studies and Information Literacy

★1 (fi 2) (either term, 1-0-0). Introduction to Library research skills in the discipline of Business Studies. Prerequisite: Second-year standing in the Management Program. Corequisite: Any senior course in Management that requires library research. Notes: Credit may be obtained for only one of AUMGT 212 and AUECO 212. The corequisite must be taken concurrently.

#### AUMGT 310 Corporate Finance

★3 (fi 6) (either term, 3-0-0). Introduction to the institutional environment of corporate finance. Topics include corporate financial analysis, planning and control, management of assets, time value of money, capital budgeting; short, medium, and long term financing; mergers, and reorganization/acquisitions. Prerequisites: AUSTA 153, AUACC 311 and AUMGT 200.

#### AUMGT 320 Business Law

★3 (fi 6) (either term, 3-0-0). Examines aspects of business/commercial law as it relates to business. Principles of law and its application to typical business situations are discussed. Prerequisites: AUMGT 200.

#### AUMGT 323 Industrial Organization

★3 (fi 6) (either term, 3-0-0). Exploration of various patterns of internal organization in industries, focusing on the relations among the structure, conduct, and performance of the industries. Prerequisite: AUECO 101. Note: Credit may be obtained for only one of AUMGT 323 and AUECO 323.

#### AUMGT 330 Introduction to Marketing

★3 (fi 6) (either term, 3-0-0). Introduction to the theory of marketing and its practice. The role of marketing within the business environment is discussed. Topics include the product design and management, national and international marketing strategies, consumer behaviour, product distribution and pricing, and market research. Prerequisites: AUMGT 200.

#### AUMGT 340 Organizational Behaviour

★3 (fi 6) (either term, 3-0-0). Study of individuals and groups in an organizational setting. The course will help the student develop an understanding of the organizational behaviour concepts and the interaction between individual determinants of behaviour and group dynamics. Prerequisite: AUMGT 200.

#### AUMGT 360 Hockey: Culture and Commerce

★3 (fi 6) (either term, 3-0-0). Examination of the cultural and business aspects of the sport of hockey, historically and in the present. The course explores such topics as fan identities, cultural memory and tradition, race and ethnicity, gender and youth culture, labour relations and free agency, salary caps and revenue sharing, minor hockey, audiences and the mass media, fighting and violence, league expansion and franchise relocations, and arena construction. Prerequisites: AUMGT 200 or consent of the instructor, third-year standing. Note: Credit may be obtained for only one of AUMGT 360 and AUPED 360.

#### AUMGT 380 Selected Topics in Management

★3 (fi 6) (either term, 3-0-0). This course covers selected topics in Management. Topics may vary from year to year depending on the instructor and student interest. Prerequisites: AUMGT 200 or consent of instructor. Notes: Minimum third year standing.

#### AUMGT 381 Selected Topics in Management

★3 (fi 6) (either term, 3-0-0). This course covers selected topics in Management. Topics may vary from year to year depending on the instructor and student interest. Prerequisites: AUMGT 200 or consent of instructor. Notes: Minimum third year standing.

#### AUMGT 399 Management Internship

★6 (fi 12) (two term, 3-0-0). Students will combine work experience with academic study through the development and completion of an internship program related to management. As part of the internship, students are required to complete a major project related to their work. Prerequisites: AUMGT 200, third year standing and consent of the instructor.

#### AUMGT 422 Industrial Organization and Policy

★3 (fi 6) (either term, 3-0-0). Examination of oligopoly theory, the economics of mergers and takeovers, competition policy, and industry regulation. Prerequisites: AUECO 203 and one of AUECO 323 and AUMGT 323. Note: Credit may be obtained for only one of AUMGT 422 and AUECO 422.

#### AUMGT 490 Business Policy and Strategy

★3 (fi 6) (either term, 3-0-0). Capstone course for the Management in Business Economics program. The course helps the student develop overall directions of an organization and mobilize human and other resources to accomplish strategic goals. The skills, concepts, and tools learned in various courses form the framework for making strategic decision. Prerequisite: Completion of all other courses in the Management Foundations, or consent of program adviser. Notes: Open only to a student in the Bachelor of Management in Business Economics Program.

## 231.47 Augustana Faculty - Mathematics, AUMAT

Department of Science  
Augustana Faculty

### Undergraduate Courses

#### AUMAT 107 Higher Arithmetic

★3 (fi 6) (either term, 3-0-0). Elementary number theory, numeration systems, number systems, sets, logic, and elementary probability theory. Prerequisite: One of Pure Mathematics 30, Applied Mathematics 30 or Mathematics 30-1, consent of the instructor. Notes: The course does not count toward the major in Mathematics and Physics or the minor in Mathematics. Credit may not be obtained for AUMAT 107 if credit has already been obtained for AUMAT 250.

#### AUMAT 110 Elementary Calculus I

★3 (fi 6) (either term, 4,5-0-0). Limits; differentiation and integration of algebraic, trigonometric, exponential, and logarithmic functions; applications. Prerequisite: Pure Mathematics 30 or Mathematics 30-1. Notes: The course is normally not

open to a student with credit in Mathematics 31. Credit may be obtained for only one of AUMAT 110 and 111.

#### **AUMAT 111 Elementary Calculus I**

★3 (*fi 6*) (first term, 3-0-0). Limits; differentiation and integration of algebraic, trigonometric, exponential, and logarithmic functions; applications. Prerequisites: Pure Mathematics 30 or Mathematics 30-1 and Mathematics 31. Note: Credit may be obtained for only one of AUMAT 111 and 110.

#### **AUMAT 112 Elementary Calculus II**

★3 (*fi 6*) (second term, 3-0-0). Fundamental Theorem, inverse trigonometric functions and their derivatives, indeterminate forms, improper integrals, techniques of integration, applications. Prerequisite: AUMAT 110 or 111.

#### **AUMAT 120 Linear Algebra I**

★3 (*fi 6*) (either term, 3-0-0). Vector and matrix algebra, determinants, linear systems of equations, vector spaces, eigenvalues and eigenvectors, applications. Prerequisite: Pure Mathematics 30 or Mathematics 30-1.

#### **AUMAT 211 Intermediate Calculus I**

★3 (*fi 6*) (either term, 3-0-0). Infinite series, plane curves, polar coordinates, vectors and three-dimensional analytic geometry, cylindrical and spherical coordinates, elements of linear differential equations. Prerequisite: AUMAT 112.

#### **AUMAT 212 Intermediate Calculus II**

★3 (*fi 6*) (either term, 3-0-0). Functions of several variables, partial derivatives, integration in two and three dimensions, vector functions, space curves, arc length, line integrals, Green's theorem, surface integrals, Stokes' theorem, the divergence theorem. Prerequisite: AUMAT 211.

#### **AUMAT 220 Linear Algebra II**

★3 (*fi 6*) (either term, 3-0-0). Vector spaces, bases, linear transformations, change of bases, eigenvectors, characteristic polynomials, diagonalization, inner products and Gram-Schmidt orthogonalization, orthogonal and unitary operators. Prerequisites: AUMAT 110 or 111, and 120.

#### **AUMAT 229 Introduction to Group Theory**

★3 (*fi 6*) (either term, 3-0-0). Groups as a measure of symmetry. Groups of rigid motions. Frieze groups, and finite groups in two and three dimensions. Groups of matrices. Group actions with application to counting problems. Permutation groups. Subgroups, cosets, and Lagrange's Theorem. Quotient groups and homomorphisms. Prerequisites: AUMAT 110 or 111, and 120.

#### **AUMAT 235 Mathematics in Economics and Finance**

★3 (*fi 6*) (either term, 3-0-0). Mathematical analysis of problems arising in economics and finance, including an introduction to economic modelling; simple, compound, and continuous rates of interest; static and comparative-static analysis; optimization; annuities, mortgages, bonds, and other securities; and dynamics. Prerequisites: AUECO 101 and one of AUMAT 110, 111. Note: Credit may be obtained for only one of AUMAT 235, AUECO 206, AUMGT 206.

#### **AUMAT 250 Discrete Mathematics**

★3 (*fi 6*) (first term, 3-0-0). Sets, functions, elementary propositional and predicate logic, Boolean algebra, elementary graph theory, proof techniques (including induction and contradiction), and combinatorics. Prerequisites: AUMAT 110 or 111, and 120.

#### **AUMAT 260 Topics in Geometry**

★3 (*fi 6*) (either term, 3-0-0). Axiomatic systems and finite geometries; Euclidean geometry and modern synthetic geometry, including Euclid's and Hilbert's axioms, Menelaus' and Ceva's theorems, the nine-point circle, and Morley's theorem; constructions; isometries of the plane and groups of transformations; non-Euclidean geometry; applications. Prerequisite: AUMAT 120 or consent of the instructor.

#### **AUMAT 315 Complex Variables**

★3 (*fi 6*) (either term, 3-0-0). Complex numbers, functions of a complex variable, analytic functions, Cauchy and related theorems, Taylor and Laurent expansions, the residue calculus and applications, harmonic functions, conformal mapping, applications. Prerequisite: AUMAT 212.

#### **AUMAT 330 Ordinary Differential Equations**

★3 (*fi 6*) (second term, 3-0-0). First- and higher-order equations; methods of solution, including complex variable techniques; series solutions; elementary transform techniques; oscillation theory; applications to biology and physics. Prerequisite: AUMAT 211.

#### **AUMAT 332 Mathematical Ecology and Dynamical Systems**

★3 (*fi 6*) (either term, 3-0-0). Mathematical analysis of problems associated with ecology, including models of population growth (e.g., discrete, continuous, age-structured, limited carrying capacity), the population dynamics of ecosystems, the spread of epidemics, the transport of pollutants, and the sustainable harvesting of vegetation and animal populations. Fundamental concepts of discrete and continuous dynamical systems, both linear and nonlinear. Prerequisites: AUMAT 120 and 211.

#### **AUMAT 340 Numerical Methods**

★3 (*fi 6*) (either term, 3-0-1.5). Computer arithmetic and errors, solution of systems of linear equations, root finding, interpolation, numerical quadrature, and

numerical solutions of ordinary differential equations. Applications from physics are included. Prerequisites: AUMAT 120, Corequisite AUMAT 211; or consent of the instructor. Note: Credit may be obtained for only one of AUMAT 340, AUCSC 340, AUPHY 340.

#### **AUMAT 355 Theory of Computing**

★3 (*fi 6*) (second term, 3-0-0). Models of computers including finite automata and Turing machines, computability, basics of formal languages with applications to the syntax of programming languages, unsolvable problems and their relevance to the semantics of programming, and concepts of computational complexity, including algorithm optimality. Prerequisite: AUCSC 110 and AUMAT 250. Note: Credit may be obtained for only one of AUMAT 355 and AUCSC 315.

#### **AUMAT 395 Directed Study**

★3 (*fi 6*) (either term, 1-0-3). Intensive study of a specific mathematical problem or other area of mathematics as defined by the student and a supervising instructor. Notes: Admission to AUMAT 395 normally requires a minimum GPA of 3.0 on the major in Mathematics and Physics. An "Application for Individual Study" must be completed and approved before registration in the course.

#### **AUMAT 480 History of Mathematics and Physics**

★3 (*fi 6*) (either term, 3-0-0). Integrated history of mathematics and physics, emphasizing the scientific revolution and the subsequent development of mathematics and physics as distinct disciplines. Prerequisite: AUMAT 211 and one of AUMAT 220, 229, 250. Note: Credit may be obtained for only one of AUMAT 480, 380, AUPHY 380, 480.

#### **AUMAT 495 Directed Study**

★3 (*fi 6*) (either term, 1-0-3). Intensive study of a specific problem or area of mathematics as defined by the student and a supervising instructor. Prerequisite: Fourth-year standing. Notes: Admission to AUMAT 495 normally requires a minimum GPA of 3.0 on the major in Mathematics and Physics. An "Application for Individual Study" must be completed and approved before registration in the course.

## 231.48 Augustana Faculty - Music, AUMUS

Department of Fine Arts  
Augustana Faculty

### Undergraduate Courses

#### **AUMUS 100 Introduction to Music Theory**

★3 (*fi 6*) (either term, 3-0-0). Fundamentals of music, including notation, rudiments, and elementary harmonic progressions. Prerequisite: Completion of the Music Theory Placement Examination (MTPE) or consent of the instructor. Notes: The course is not open to a student scoring 70% or more on the MTPE. The course does not count toward any major, or minor in Music.

#### **AUMUS 127 Voice Class**

★2 (*fi 4*) (either term, 0-1.5L-0). Fundamental vocal and performance skills for those with little or no training. A weekly group lesson over two terms. Prerequisite: Consent of the Department. Notes: A fee is assessed; group lesson rate applies.

#### **AUMUS 140 Augustana Choir**

★1.5 (*fi 3*) (second term, 0-4.5L-0). Performance of choral music for mixed choir, including required participation in a performance tour which may follow the winter term. Prerequisite: Consent of Instructor based on audition. Notes: a ★1.5 course over the winter term.

#### **AUMUS 141 The Augustana Choir**

★3 (*fi 6*) (two term, 0-4.5L-0). Performance of choral music for mixed choir, including required participation in a performance tour which may follow the winter term. Prerequisite: Consent of the instructor, based on audition. Notes: Not open to a part-time student who has less than one year of the degree program completed. A ★3 course over the full year. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **AUMUS 142 Choral Ensemble**

★1 (*fi 2*) (first term, 0-2L-0). Performance of choral music. Prerequisite: Consent of Instructor. Notes: a ★1 course over the fall term. The course does not require participation in a performance tour.

#### **AUMUS 143 Choral Ensemble**

★1 (*fi 2*) (second term, 0-2L-0). Performance of choral music. Prerequisite: Consent of the instructor. Notes: A ★1 course over the winter term. The course does not require participation in a performance tour.

#### **AUMUS 144 Choral Ensemble**

★2 (*fi 4*) (two term, 0-2L-0). Performance of choral music. Prerequisite: Consent of the instructor. Notes: A ★2 course over the full year. The course does not require participation in a performance tour.

#### **AUMUS 145 Encore**

★2 (*fi 4*) (two term, 0-3L-0). Performance of traditional chamber and vocal jazz music for small mixed choir including required participation in scheduled

mini-tour(s) which may occur during spring break. Prerequisite: Consent of the instructor, based on audition. Corequisite: AUMUS 141. Note: A ★2 course over the full year.

#### **AUMUS 147 Chamber Ensemble**

★3 (*fi 6*) (two term, 0-0.5L-0). Varies in constitution (e.g., voice and piano, woodwind trio, brass quartet) from year to year. The repertoire to be performed is decided by the students and instructor. The ensemble prepares and performs under the guidance of the instructor. Prerequisite: Consent of the Department. Notes: An "Application for Chamber Ensemble Studies" must be completed and approved before registration in the course. A ★3 course over the full year.

#### **AUMUS 149 Instrumental Ensemble**

★2 (*fi 4*) (two term, 0-1.5L-0). Includes participation in all scheduled concert events. Prerequisite: Consent of the Department. Notes: An "Application for Instrumental Ensemble Studies" must be completed and approved before registration in the course. A ★2 course over the full year.

#### **AUMUS 160 Theoretical and Analytical Studies I**

★3 (*fi 6*) (either term, 3-0-0). Study of common-practice harmony: scales and modes, intervals, triads, figured bass, cadences, nonharmonic tones, harmonic progression and rhythm, part-writing, seventh chords, diatonic modulation. Prerequisites: AUMUS 100 or a score higher than 70% in the Music Theory Placement Examination (MTPE), and completion of the Keyboard Skills Interview (KSI). Corequisite: AUMUS 162.

#### **AUMUS 162 Aural and Sight Singing Skills I**

★1.5 (*fi 3*) (either term, 2-1L-0). Development of listening and reading skills integral to the internalization of concepts covered in AUMUS 160. Prerequisites: AUMUS 100 or a score higher than 70% in the Music Theory Placement Examination (MTPE), and completion of the Keyboard Skills Interview (KSI). Corequisite: AUMUS 160.

#### **AUMUS 170 Tuning In: An Introduction to Music**

★3 (*fi 6*) (first term, 3-0-0). Development of listening approaches and techniques for understanding and appreciating a variety of Western and non-Western music, and an examination of the ideologies that prompt the sampling of such music. Music studied includes Western art music, African music, First Nations music, North Indian music, and popular music.

#### **AUMUS 188 Concerto**

★4 (*fi 8*) (two term, 0-1L-0). Private lessons in instrument or voice and the presentation of a partial concerto or, for singers, a work or group of works normally performed with orchestra; one-hour weekly lesson offered over two terms. Prerequisite: Consent of the Department. Note: Restricted to Piano and Voice performance majors in their first year. A student should consult the Department of Fine Arts before registering.

#### **AUMUS 189 Service Playing**

★2 (*fi 4*) (two term, 0-0.5L-0). Private keyboard lessons in the playing of hymns and chants, liturgies, conducting from the keyboard, transcription, improvisations, and transposition; a half-hour lesson weekly over two terms. Prerequisite: Consent of the Department. Notes: Restricted to Liturgical Arts majors. A student should consult the Fine Arts Department before registering.

#### **AUMUS 190 Applied Music**

★1 (*fi 2*) (either term, 0-0.5L-0). Private lessons in instrument or voice; a half-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to International Program students. A student should consult the Fine Arts Department before registering.

#### **AUMUS 191 Applied Music**

★2 (*fi 4*) (two term, 0-0.5L-0). Private lessons in instrument or voice; a half-hour weekly lesson over two terms. Prerequisite: Consent of the Department. Notes: A student should consult the Fine Arts Department before registering.

#### **AUMUS 192 Applied Music**

★1.5 (*fi 3*) (either term, 0-0.75L-0). Private lessons in instrument or voice; a three-quarter-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to International Program students. A student should consult the Fine Arts Department before registering.

#### **AUMUS 193 Applied Music**

★3 (*fi 6*) (two term, 0-0.75L-0). Private lessons in instrument or voice; a three-quarter-hour weekly lesson over two terms. Prerequisite: Consent of the Department. Notes: A student should consult the Fine Arts Department before registering.

#### **AUMUS 194 Applied Music**

★2 (*fi 4*) (either term, 0-1L-0). Private lessons in instrument or voice; a one-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to International Program students. A student should consult the Fine Arts Department before registering.

#### **AUMUS 195 Applied Music**

★4 (*fi 8*) (two term, 0-1L-0). Private lessons in instrument or voice; a one-hour weekly lesson over two terms. Prerequisite: Consent of the Department. Notes: A student should consult the Fine Arts Department before registering.

#### **AUMUS 196 Applied Music**

★3 (*fi 6*) (first term, 0-2.5L-0). Private lessons in instrument or voice; a one-hour weekly lesson in the fall term for a student exhibiting advanced abilities in music performance. Participation in group master classes is required. Prerequisite: Consent of the Department. Notes: A student should consult the Fine Arts Department before registering. The following courses must be taken in consecutive fall/winter terms: AUMUS 196 and 197.

#### **AUMUS 197 Applied Music**

★3 (*fi 6*) (second term, 0-2.5L-0). Private lessons in instrument or voice; a one-hour weekly lesson in the winter term for a student exhibiting advanced abilities in music performance. Participation in group master classes is required. Prerequisite: Consent of the Department. Notes: A student should consult the Fine Arts Department before registering. The following courses must be taken in consecutive fall/winter terms: AUMUS 196 and 197.

#### **AUMUS 198 Fundamental Keyboard Skills**

★1 (*fi 2*) (either term, 0-0.5L-0). Private piano lessons; a half-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to students who want to develop specific skills required to pass the Keyboard Skills Proficiency Examination (KSPE), and to International Program students. A student should consult the Fine Arts Department before registering.

#### **AUMUS 199 Fundamental Keyboard Skills**

★2 (*fi 4*) (two term, 0-0.5L-0). Private piano lessons; a half-hour weekly lesson over two terms. Prerequisite: Consent of the Department. Notes: Restricted to students who want to develop specific skills required to pass the Keyboard Skills Proficiency Examination (KSPE). A student should consult the Fine Arts Department before registering.

#### **AUMUS 223 Music of the Caribbean**

★3 (*fi 6*) (second term, 3-0-0). Study of selected musical traditions within the Caribbean. How musical styles are shaped by their interactions with language, religion, economy, other arts, and the whole fabric of social life are explored. Prerequisite: AUMUS 170 or consent of the instructor. Note: The course is available only as part of the Augustana-in-Cuba Program.

#### **AUMUS 224 Medieval and Renaissance Music**

★3 (*fi 6*) (either term, 3-0-0). Study of Western European art music through the medieval and Renaissance periods. Prerequisite: AUMUS 170 or consent of the instructor.

#### **AUMUS 225 Baroque and Classical Music**

★3 (*fi 6*) (either term, 3-0-0). Examination of Western European art music of the seventeenth and eighteenth centuries in the context of general cultural history. Prerequisite: AUMUS 170 or consent of the instructor.

#### **AUMUS 226 Romantic and Twentieth-Century Music**

★3 (*fi 6*) (either term, 3-0-0). Music from early Romanticism to the present. Both musicological and interdisciplinary analytical approaches are emphasized. Prerequisite: AUMUS 170 or consent of the instructor.

#### **AUMUS 227 History of Vocal Literature**

★3 (*fi 6*) (either term, 3-0-0). Survey of vocal literature from the seventeenth century to the present.

#### **AUMUS 228 Music Studies and Information Literacy**

★1.5 (*fi 3*) (either term, 1.5-0-0). Introduction to music research skills by a librarian with a graduate degree in Library and Information Studies. The course examines on-line catalogues, periodical indexes, the internet, general research skills, traditional library resources, style manuals, bibliography creation, plagiarism, and evolving technological issues in research. Implementing critical thinking skills to gain access to, evaluate, and use information is emphasized. Prerequisite: Second-year status in a Music degree program or consent of the instructor. Corequisite: Any senior course in Music that requires library research. Note: The corequisite must be taken concurrently.

#### **AUMUS 229 History of Piano Literature**

★3 (*fi 6*) (either term, 3-0-0). Survey of piano literature from the seventeenth century to the present.

#### **AUMUS 235 Introduction to Conducting**

★3 (*fi 6*) (either term, 3-0-0). Fundamental conducting techniques as applied to instrumental and vocal music. Prerequisite: AUMUS 160 and 162, or consent of the instructor.

#### **AUMUS 236 Introduction to Choral Techniques, Literature, and Interpretation**

★3 (*fi 6*) (either term, 3-0-0). Introduction to choral techniques, interpretation, and choral literature. Prerequisite: AUMUS 235 or consent of the instructor.

#### **AUMUS 238 Piano Pedagogy**

★3 (*fi 6*) (either term, 3-0-0). Principles, methods, and techniques for teaching piano with a survey of various pedagogical schools of thought. Prerequisite: AUMUS 160 or consent of the instructor.

#### **AUMUS 239 Vocal Pedagogy**

★3 (*fi 6*) (either term, 2-1L-0). Comprehensive study of the voice and how it functions,



survey of current methods, and supervised practical instruction. Prerequisite: Applied music in voice at the 200 level, or consent of the instructor.

#### **AUMUS 240 Augustana Choir**

★1.5 (*fi 3*) (second term, 0-4.5L-0). Performance of choral music for mixed choir, including required participation in a performance tour which may follow the winter term. Prerequisite: Consent of Instructor based on audition. Notes: a ★1.5 course over the winter term.

#### **AUMUS 241 The Augustana Choir**

★3 (*fi 6*) (two term, 0-4.5L-0). Performance of choral music for mixed choir, including required participation in a performance tour which may follow the winter term. Prerequisite: Consent of the instructor, based on audition. Notes: Not open to a part-time student who has less than one year of the degree program completed. A ★3 course over the full year. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **AUMUS 242 Choral Ensemble**

★1 (*fi 2*) (first term, 0-2L-0). Performance of choral music. Prerequisite: Consent of Instructor. Notes: a ★1 course over the fall term. The course does not require participation in a performance tour.

#### **AUMUS 243 Choral Ensemble**

★1 (*fi 2*) (second term, 0-2L-0). Performance of choral music. Prerequisite: Consent of the instructor. Notes: A ★1 course over the winter term. The course does not require participation in a performance tour.

#### **AUMUS 244 Choral Ensemble**

★2 (*fi 4*) (two term, 0-2L-0). Performance of choral music. Prerequisite: Consent of the instructor. Notes: A ★2 course over the full year. The course does not require participation in a performance tour.

#### **AUMUS 245 Encore**

★2 (*fi 4*) (two term, 0-3L-0). Performance of traditional chamber and vocal jazz music for small mixed choir including required participation in scheduled mini-tour(s) which may occur during spring break. Prerequisite: Consent of the instructor, based on audition. Corequisite: AUMUS 241. Note: A ★2 course over the full year.

#### **AUMUS 247 Chamber Ensemble**

★3 (*fi 6*) (two term, 0-0.5L-0). Varies in constitution (e.g., voice and piano, woodwind trio, brass quartet) from year to year. The repertoire to be performed is decided by the students and instructor. The ensemble prepares and performs under the guidance of the instructor. Prerequisite: Consent of the Department. Notes: An "Application for Chamber Ensemble Studies" must be completed and approved before registration in the course. A ★3 course over the full year.

#### **AUMUS 249 Instrumental Ensemble**

★2 (*fi 4*) (two term, 0-1.5L-0). Includes participation in all scheduled concert events. Prerequisite: Consent of the Department. Notes: An "Application for Instrumental Ensemble Studies" must be completed and approved before registration in the course. A ★2 course over the full year.

#### **AUMUS 260 Theoretical and Analytical Studies II**

★3 (*fi 6*) (either term, 3-0-0). Continuation of the study of common-practice harmony, including secondary dominants, borrowed chords, chromatic and enharmonic modulations, and extended chords. Prerequisite: AUMUS 160. Corequisite: AUMUS 262.

#### **AUMUS 261 Theoretical and Analytical Studies III**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of common-practice harmony, including Neapolitan sixths, augmented sixths, altered dominants, and chromatically altered chords; modulations to foreign keys and third-relation harmony; polychords, modal mixture, and extended chromaticism. Prerequisite: AUMUS 260. Corequisite: AUMUS 263.

#### **AUMUS 262 Aural and Sight Singing Skills II**

★1.5 (*fi 3*) (either term, 2-1L-0). Development of listening and reading skills integral to the internalization of concepts covered in AUMUS 260. Prerequisite: AUMUS 162. Corequisite: AUMUS 260.

#### **AUMUS 263 Aural and Sight Singing Skills III**

★1.5 (*fi 3*) (either term, 2-1L-0). Development of listening and reading skills integral to the internalization of concepts covered in AUMUS 261. Prerequisites: AUMUS 260 and 262. Corequisite: AUMUS 261.

#### **AUMUS 265 Introduction to Composition**

★3 (*fi 6*) (two term, 0-1.5L-0). Exploration, through written exercises and assignments, of the development of compositional systems, processes, and techniques related to twentieth-century musical idioms. Prerequisite: AUMUS 160 or consent of the instructor. Note: A ★3 course offered over the full year.

#### **AUMUS 270 Liturgical Arts I**

★3 (*fi 6*) (either term, 3-0-0). Introduction to ritual and its role within Christian celebration. An examination of the liturgical year, liturgies and hymns, contemporary styles of worship, ecumenism, cultural diversity, inclusive language, instruments in the service, and professional concerns of the church musician. Current rural,

urban, English, French, multicultural, and First Nations communities are addressed, including their respective histories and futures within Canada. Projects include the designing of liturgies and composing of music for diverse communities. Prerequisite: AUMUS 260 or consent of the instructor.

#### **AUMUS 271 Liturgical Arts II**

★3 (*fi 6*) (either term, 3-0-0). Continuation of topics and projects introduced in AUMUS 270. Prerequisite: AUMUS 270.

#### **AUMUS 288 Concerto**

★4 (*fi 8*) (two term, 0-1L-0). Private lessons in instrument or voice and the presentation of a partial concerto or, for singers, a work or group of works normally performed with orchestra; one-hour weekly lesson offered over two terms. Prerequisite: Consent of the Department. Note: Restricted to Piano and Voice performance majors in their second year. A student should consult the Department of Fine Arts before registering.

#### **AUMUS 289 Service Playing**

★2 (*fi 4*) (two term, 0-0.5L-0). Private keyboard lessons in the playing of hymns and chants, liturgies, conducting from the keyboard, transcription, improvisations, and transposition; a half-hour lesson weekly over two terms. Prerequisite: Consent of the Department. Notes: Restricted to Liturgical Arts majors. A student should consult the Fine Arts Department before registering.

#### **AUMUS 290 Applied Music**

★1 (*fi 2*) (either term, 0-0.5L-0). Private lessons in instrument or voice; a half-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to International Program students. A student should consult the Fine Arts Department before registering.

#### **AUMUS 291 Applied Music**

★2 (*fi 4*) (two term, 0-0.5L-0). Private lessons in instrument or voice; a half-hour weekly lesson over two terms. Prerequisite: Consent of the Department. Notes: A student should consult the Fine Arts Department before registering.

#### **AUMUS 292 Applied Music**

★1.5 (*fi 3*) (either term, 0-0.75L-0). Private lessons in instrument or voice; a three-quarter-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to International Program students. A student should consult the Fine Arts Department before registering.

#### **AUMUS 293 Applied Music**

★3 (*fi 6*) (two term, 0-0.75L-0). Private lessons in instrument or voice; a three-quarter-hour weekly lesson over two terms. Prerequisite: Consent of the Department. Notes: A student should consult the Fine Arts Department before registering.

#### **AUMUS 294 Applied Music**

★2 (*fi 4*) (either term, 0-1L-0). Private lessons in instrument or voice; a one-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to International Program students. A student should consult the Fine Arts Department before registering.

#### **AUMUS 295 Applied Music**

★4 (*fi 8*) (two term, 0-1L-0). Private lessons in instrument or voice; a one-hour weekly lesson over two terms. Prerequisite: Consent of the Department. Notes: A student should consult the Fine Arts Department before registering.

#### **AUMUS 296 Applied Music**

★3 (*fi 6*) (either term, 0-2.5L-0). Private lessons in instrument or voice; a one-hour weekly lesson in the fall term for a student exhibiting advanced abilities in music performance. Participation in group master classes is required. Prerequisite: Consent of the Department. Notes: A student should consult the Fine Arts Department before registering. The following courses must be taken in consecutive fall/winter terms: AUMUS 296 and 297.

#### **AUMUS 297 Applied Music**

★3 (*fi 6*) (either term, 0-2.5L-0). Private lessons in instrument or voice; a one-hour weekly lesson in the winter term for a student exhibiting advanced abilities in music performance. Participation in group master classes is required. Prerequisite: Consent of the Department. Notes: A student should consult the Fine Arts Department before registering. The following courses must be taken in consecutive fall/winter terms: AUMUS 296 and 297.

#### **AUMUS 298 Fundamental Keyboard Skills**

★1 (*fi 2*) (either term, 0-0.5L-0). Private piano lessons; a half-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to students who want to develop specific skills required to pass the Keyboard Skills Proficiency Examination (KSPE), and to International Program students. A student should consult the Fine Arts Department before registering.

#### **AUMUS 299 Fundamental Keyboard Skills**

★2 (*fi 4*) (two term, 0-0.5L-0). Private piano lessons; a half-hour weekly lesson over two terms. Prerequisite: Consent of the Department. Notes: Restricted to students who want to develop specific skills required to pass the Keyboard Skills Proficiency Examination (KSPE). A student should consult the Fine Arts Department before registering.

**AUMUS 320 Music and the Canadian Identity**

★3 (*fi 6*) (either term, 0-3s-0). Critical examination of four centuries of ways in which Canadians identify “themselves” and relate to “others”, as revealed through music and other artifacts of music making. Traditional musicological perspectives are integrated with those from ethnomusicology and post-colonial studies. Art music, country, pop, folk, and First Nations music in Canada are examined. Prerequisite: AUMUS 361 or consent of the instructor.

**AUMUS 321 Music and Gender**

★3 (*fi 6*) (either term, 0-3s-0). Criticism of Western art music has undergone a profound change as new modes of critical thought reveal new areas of meaning in the traditional repertoire. Well-known examples of Western art music and of issues related to this tradition are examined through the perspectives of feminist theory and queer theory (gay and lesbian studies). Prerequisite: AUMUS 170 or consent of the instructor.

**AUMUS 322 Rethinking Music: From Mozart to Madonna**

★3 (*fi 6*) (either term, 0-3s-0). Introduction to current issues in musicological thought. The course examines traditional ways of thinking about music, and considers issues such as the role of the symbol in language and music, cultural studies, ethnomusicology, the scholarly devaluation of popular music, feminist theory, and analyses of rock videos. Prerequisite: ★6 from AUMUS 224, 225, 226; or consent of the instructor. Note: Students from a variety of musical backgrounds (popular or classical) are encouraged to enrol.

**AUMUS 327 History of Vocal Literature**

★3 (*fi 6*) (either term, 3-0-0). Survey of vocal literature from the seventeenth century to the present.

**AUMUS 329 History of Piano Literature**

★3 (*fi 6*) (either term, 3-0-0). Survey of piano literature from the seventeenth century to the present.

**AUMUS 330 Selected Topics in Music**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected topics related to music history, music theory, and ethnomusicology. Topics vary from year to year and may include such diverse areas as world music, cultural and critical theory, popular music, music video, jazz, Eurowestern style periods, genres, composers, performers, audiences, set theory, and Schenkerian analysis. Prerequisites: AUMUS 261 and ★6 from AUMUS 224, 225, 226; or consent of the instructor.

**AUMUS 331 Selected Topics in Music**

★3 (*fi 6*) (two term, 1.5-0-0). Advanced study of selected topics related to music history, music theory, and ethnomusicology. Topics vary from year to year and may include such diverse areas as world music, cultural and critical theory, popular music, music video, jazz, Eurowestern style periods, genres, composers, performers, audiences, set theory, and Schenkerian analysis. Prerequisites: AUMUS 261 and ★6 from AUMUS 224, 225, 226; or consent of the instructor.

**AUMUS 332 Selected Topics in Music**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected topics related to music history, music theory, and ethnomusicology. Topics vary from year to year and may include such diverse areas as world music, cultural and critical theory, popular music, music video, jazz, Eurowestern style periods, genres, composers, performers, audiences, set theory, and Schenkerian analysis. Prerequisites: AUMUS 261 and ★6 from AUMUS 224, 225, 226; or consent of the instructor.

**AUMUS 333 Selected Topics in Music**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected topics related to music history, music theory, and ethnomusicology. Topics vary from year to year and may include such diverse areas as world music, cultural and critical theory, popular music, music video, jazz, Eurowestern style periods, genres, composers, performers, audiences, set theory, and Schenkerian analysis. Prerequisites: AUMUS 261 and ★6 from AUMUS 224, 225, 226; or consent of the instructor.

**AUMUS 334 Selected Topics in Music**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected topics related to music history, music theory, and ethnomusicology. Topics vary from year to year and may include such diverse areas as world music, cultural and critical theory, popular music, music video, jazz, Eurowestern style periods, genres, composers, performers, audiences, set theory, and Schenkerian analysis. Prerequisites: AUMUS 261 and ★6 from AUMUS 224, 225, 226; or consent of the instructor.

**AUMUS 335 Selected Topics in Music**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected topics related to music history, music theory, and ethnomusicology. Topics vary from year to year and may include such diverse areas as world music, cultural and critical theory, popular music, music video, jazz, Eurowestern style periods, genres, composers, performers, audiences, set theory, and Schenkerian analysis. Prerequisites: AUMUS 261 and ★6 from AUMUS 224, 225, 226; or consent of the instructor.

**AUMUS 336 Advanced Conducting**

★3 (*fi 6*) (either term, 3-0-0). Continued development of conducting techniques as applied to choral music. Prerequisite: AUMUS 235.

**AUMUS 337 Choral Conducting Summer Intensive: A Holistic Approach**

★3 (*fi 6*) (Spring/Summer, 0-3s-0). A holistic approach to choral conducting that

embraces all facets of choral direction, including body awareness and exploration, vocal development and technique, conducting technique, score reading and analysis, musicianship, choral pedagogy, repertoire and rehearsal techniques. Ample opportunity is provided for individual attention as well as group dialogue and discussion. Participants conduct a resident lab choir on a daily basis. Prerequisite: AUMUS 336 or consent of the department.

**AUMUS 339 Vocal Pedagogy**

★3 (*fi 6*) (either term, 2-1L-0). Comprehensive study of the voice and how it functions, survey of current methods, and supervised practical instruction. Prerequisite: Applied music in voice at the 200 level, or consent of the instructor.

**AUMUS 340 Augustana Choir**

★1.5 (*fi 3*) (second term, 0-4.5L-0). Performance of choral music for mixed choir, including required participation in a performance tour which may follow the winter term. Prerequisite: Consent of Instructor based on audition. Notes: a ★1.5 course over the winter term.

**AUMUS 341 The Augustana Choir**

★3 (*fi 6*) (two term, 0-4.5L-0). Performance of choral music for mixed choir, including required participation in a performance tour which may follow the winter term. Prerequisite: Consent of the instructor, based on audition. Notes: Not open to a part-time student who has less than one year of the degree program completed. A ★3 course over the full year. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**AUMUS 342 Choral Ensemble**

★1 (*fi 2*) (first term, 0-2L-0). Performance of choral music. Prerequisite: Consent of Instructor. Notes: a ★1 course over the fall term. The course does not require participation in a performance tour.

**AUMUS 343 Choral Ensemble**

★1 (*fi 2*) (second term, 0-2L-0). Performance of choral music. Prerequisite: Consent of the instructor. Notes: A ★1 course over the winter term. The course does not require participation in a performance tour.

**AUMUS 344 Choral Ensemble**

★2 (*fi 4*) (two term, 0-2L-0). Performance of choral music. Prerequisite: Consent of the instructor. Notes: A ★2 course over the full year. The course does not require participation in a performance tour.

**AUMUS 345 Encore**

★2 (*fi 4*) (either term, 0-3L-0). Performance of traditional chamber and vocal jazz music for small mixed choir including required participation in scheduled mini-tour(s) which may occur during spring break. Prerequisite: Consent of the instructor, based on audition. Corequisite: AUMUS 341. Note: A ★2 course over the full year.

**AUMUS 347 Chamber Ensemble**

★3 (*fi 6*) (two term, 0-0.5L-0). Varies in constitution (e.g., voice and piano, woodwind trio, brass quartet) from year to year. The repertoire to be performed is decided by the students and instructor. The ensemble prepares and performs under the guidance of the instructor. Prerequisite: Consent of the Division. Notes: An “Application for Chamber Ensemble Studies” must be completed and approved before registration in the course. A ★3 course over the full year.

**AUMUS 349 Instrumental Ensemble**

★2 (*fi 4*) (two term, 0-1.5L-0). Includes participation in all scheduled concert events. Prerequisite: Consent of the Division. Notes: An “Application for Instrumental Ensemble Studies” must be completed and approved before registration in the course. A ★2 course over the full year.

**AUMUS 361 Form, Analysis, and the Construction of Musical Meaning**

★3 (*fi 6*) (either term, 3-0-0). Study of music through harmonic, contrapuntal and structural analysis of selected pieces from the Baroque to Romantic periods. Includes the examination of prominent musical features and harmonic devices within common small- and large-scale forms. Offers a critique of the applications and limitations of conventional musical analysis. Prerequisite: AUMUS 261.

**AUMUS 367 Critical Discourse and the Fine Arts**

★3 (*fi 6*) (either term, 0-3s-0). Introduction to Theory and the Fine Arts. A critical study of historical and contemporary issues in the fine arts with an emphasis on themes common to the disciplines of drama, music and the visual arts as cultural processes. Discussions of various theoretical positions including critical and cultural theory, aesthetic theory, disciplinary history and a history of criticism. Prerequisite: Third-year standing. Note: Credit may be obtained for only one of AUMUS 367, 467, AUART 367, 467, AUDRA 367, 467.

**AUMUS 368 Ethnomusicology: Issues and Concepts**

★3 (*fi 6*) (either term, 0-3s-0). Introduction to the discipline of ethnomusicology through the exploration of various related issues, theories and methodologies in regard to “world” and popular music. Topics may include fieldwork methodologies and issues, music and identity, definitions of “tradition”, issues of representation and appropriation, music and place, transmission processes, music and gender, the relationship of music to spiritual practices, the impact of contemporary recording technologies, and the intersections of musicology, music theory and

ethnomusicology. Prerequisites: AUMUS 170 and third-year standing or consent of the instructor.

**AUMUS 369 Rethorizing Music: From Modernism to Postmodernism**

★3 (*fi 6*) (either term, 0-3s-0). Examination of technical and stylistic perspectives from Modernist art music techniques established before 1950 to those found in art, popular, and world music in the twenty-first century. Included are exercises in composition and performance as well as training in related listening, sight singing, and score-reading skills. Prerequisites: AUMUS 261 and 263.

**AUMUS 375 Co-op Education Studies I**

★1.5 (*fi 3*) (variable, 1-3.5L-0). Placement of a student with an employer organization for work experience. The practicum is designed by the student, supervising faculty member, and supervising organizational director, to integrate the liberal arts study of music with work experience in appropriate fields of business, industry, government, and the professions. Prerequisites: Third-year standing and consent of the instructor. Note: An "Application for Co-op Education Study" must be completed and approved before registration in the course.

**AUMUS 376 Directed Studies I**

★3 (*fi 6*) (either term, 1-0-0). Individual research project in a specific area of study as defined by the student and a supervising instructor. Prerequisites: Third- or fourth-year standing and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

**AUMUS 388 Concerto**

★4 (*fi 8*) (two term, 0-1L-0). Private lessons in instrument or voice and the presentation of a complete concerto or, for singers, a work or group of works normally performed with orchestra; one-hour weekly lesson offered over two terms. Prerequisite: Consent of the Department. Note: Restricted to Piano and Voice performance majors in their third year. A student should consult the Department of Fine Arts before registering.

**AUMUS 389 Service Playing**

★2 (*fi 4*) (two term, 0-0.5L-0). Private keyboard lessons in the playing of hymns and chants, liturgies, conducting from the keyboard, transcription, improvisations, and transposition; a half-hour lesson weekly over two terms. Prerequisite: Consent of the Department. Notes: Restricted to Liturgical Arts majors. A student should consult the Fine Arts Department before registering.

**AUMUS 390 Applied Music**

★1 (*fi 2*) (either term, 0-0.5L-0). Private lessons in instrument or voice; a half-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to International Program students. A student should consult the Fine Arts Department before registering.

**AUMUS 391 Applied Music**

★2 (*fi 4*) (two term, 0-0.5L-0). Private lessons in instrument or voice; a half-hour weekly lesson over two terms. Prerequisite: Consent of the Department. Notes: A student should consult the Fine Arts Department before registering.

**AUMUS 392 Applied Music**

★1.5 (*fi 3*) (either term, 0-0.75L-0). Private lessons in instrument or voice; a three-quarter-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to International Program students. A student should consult the Fine Arts Department before registering.

**AUMUS 393 Applied Music**

★3 (*fi 6*) (two term, 0-0.75L-0). Private lessons in instrument or voice; a three-quarter-hour weekly lesson over two terms. Prerequisite: Consent of the Department. Notes: A student should consult the Fine Arts Department before registering.

**AUMUS 394 Applied Music**

★2 (*fi 4*) (either term, 0-1L-0). Private lessons in instrument or voice; a one-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to International Program students. A student should consult the Fine Arts Department before registering.

**AUMUS 395 Applied Music**

★4 (*fi 8*) (two term, 0-1L-0). Private lessons in instrument or voice; a one-hour weekly lesson over two terms. Prerequisite: Consent of the Department. Notes: A student should consult the Fine Arts Department before registering.

**AUMUS 396 Performance Studies I**

★3 (*fi 6*) (variable, 0-3L-0). Formal recital (minimum duration: 45 minutes) prepared under the guidance of the instructor and marked by a jury. Prerequisite: Consent of the instructor. Corequisite: AUMUS 395.

**AUMUS 397 Applied Music**

★7 (*fi 14*) (two term, 0-2L-0). Private lessons in instrument or voice and the presentation of a formal recital (minimum duration: 45 minutes) prepared under the guidance of the instructor and marked by a jury. Participation in group master classes is required. Prerequisite: Consent of the Department. Note: This course is restricted to Liturgical Arts, Musical Arts, Piano, and Voice majors in the Bachelor of Music program.

**AUMUS 398 Fundamental Keyboard Skills**

★1 (*fi 2*) (either term, 0-0.5L-0). Private piano lessons; a half-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to students who want to develop specific skills required to pass the Keyboard Skills Proficiency Examination (KSPE), and to International Program students. A student should consult the Fine Arts Department before registering.

**AUMUS 399 Fundamental Keyboard Skills**

★2 (*fi 4*) (two term, 0-0.5L-0). Private piano lessons; a half-hour weekly lesson over two terms. Prerequisite: Consent of the Department. Notes: Restricted to students who want to develop specific skills required to pass the Keyboard Skills Proficiency Examination (KSPE). A student should consult the Fine Arts Department before registering.

**AUMUS 420 Music and the Canadian Identity**

★3 (*fi 6*) (either term, 0-3s-0). Critical examination of four centuries of ways in which Canadians identify "themselves" and relate to "others", as revealed through music and other artifacts of music making. Traditional musicological perspectives are integrated with those from ethnomusicology and post-colonial studies. Art music, country, pop, folk, and First Nations music in Canada are examined. Prerequisite: AUMUS 361 or consent of instructor.

**AUMUS 421 Music and Gender**

★3 (*fi 6*) (either term, 0-3s-0). Criticism of Western art music has undergone a profound change as new modes of critical thought reveal new areas of meaning in the traditional repertoire. Well-known examples of Western art music and of issues related to this tradition are examined through the perspectives of feminist theory and queer theory (gay and lesbian studies). Prerequisite: AUMUS 170 or consent of the instructor.

**AUMUS 422 Rethinking Music: From Mozart to Madonna**

★3 (*fi 6*) (either term, 0-3s-0). Introduction to current issues in musicological thought. The course examines traditional ways of thinking about music, and considers issues such as the role of the symbol in language and music, cultural studies, ethnomusicology, the scholarly devaluation of popular music, feminist theory, and analyses of rock videos. Prerequisite: ★6 from AUMUS 224, 225, 226; or consent of the instructor. Note: Students from a variety of musical backgrounds (popular or classical) are encouraged to enrol.

**AUMUS 430 Selected Topics in Music**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected topics related to music history, music theory, and ethnomusicology. Topics vary from year to year and may include such diverse areas as world music, cultural and critical theory, popular music, music video, jazz, Eurowestern style periods, genres, composers, performers, audiences, set theory, and Schenkerian analysis. Prerequisites: AUMUS 261 and ★6 from AUMUS 224, 225, 226; or consent of the instructor.

**AUMUS 431 Selected Topics in Music**

★3 (*fi 6*) (two term, 1.5-0-0). Advanced study of selected topics related to music history, music theory, and ethnomusicology. Topics vary from year to year and may include such diverse areas as world music, cultural and critical theory, popular music, music video, jazz, Eurowestern style periods, genres, composers, performers, audiences, set theory, and Schenkerian analysis. Prerequisites: AUMUS 261 and ★6 from AUMUS 224, 225, 226; or consent of the instructor.

**AUMUS 432 Selected Topics in Music**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected topics related to music history, music theory, and ethnomusicology. Topics vary from year to year and may include such diverse areas as world music, cultural and critical theory, popular music, music video, jazz, Eurowestern style periods, genres, composers, performers, audiences, set theory, and Schenkerian analysis. Prerequisites: AUMUS 261 and ★6 from AUMUS 224, 225, 226; or consent of the instructor.

**AUMUS 433 Selected Topics in Music**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected topics related to music history, music theory, and ethnomusicology. Topics vary from year to year and may include such diverse areas as world music, cultural and critical theory, popular music, music video, jazz, Eurowestern style periods, genres, composers, performers, audiences, set theory, and Schenkerian analysis. Prerequisites: AUMUS 261 and ★6 from AUMUS 224, 225, 226; or consent of the instructor.

**AUMUS 434 Selected Topics in Music**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected topics related to music history, music theory, and ethnomusicology. Topics vary from year to year and may include such diverse areas as world music, cultural and critical theory, popular music, music video, jazz, Eurowestern style periods, genres, composers, performers, audiences, set theory, and Schenkerian analysis. Prerequisites: AUMUS 261 and ★6 from AUMUS 224, 225, 226; or consent of the instructor.

**AUMUS 435 Selected Topics in Music**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected topics related to music history, music theory, and ethnomusicology. Topics vary from year to year and may include such diverse areas as world music, cultural and critical theory, popular music, music video, jazz, Eurowestern style periods, genres, composers, performers, audiences, set theory, and Schenkerian analysis. Prerequisites: AUMUS 261 and ★6 from AUMUS 224, 225, 226; or consent of the instructor.



**AUMUS 440 Augustana Choir**

★1.5 (*fi 3*) (second term, 0-4.5L-0). Performance of choral music for mixed choir, including required participation in a performance tour which may follow the winter term. Prerequisite: Consent of Instructor based on audition. Notes: a ★1.5 course over the winter term.

**AUMUS 441 The Augustana Choir**

★3 (*fi 6*) (two term, 0-4.5L-0). Performance of choral music for mixed choir, including required participation in a performance tour which may follow the winter term. Prerequisite: Consent of the instructor, based on audition. Notes: Not open to a part-time student who has less than one year of the degree program completed. A ★3 course over the full year. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**AUMUS 442 Choral Ensemble**

★1 (*fi 2*) (first term, 0-2L-0). Performance of choral music. Prerequisite: Consent of Instructor. Notes: A ★1 course over the fall term. The course does not require participation in a performance tour.

**AUMUS 443 Choral Ensemble**

★1 (*fi 2*) (second term, 0-2L-0). Performance of choral music. Prerequisite: Consent of the instructor. Notes: A ★1 course over the winter term. The course does not require participation in a performance tour.

**AUMUS 444 Choral Ensemble**

★2 (*fi 4*) (two term, 0-2L-0). Performance of choral music. Prerequisite: Consent of the instructor. Notes: A ★2 course over the full year. The course does not require participation in a performance tour.

**AUMUS 445 Encore**

★2 (*fi 4*) (two term, 0-3L-0). Performance of traditional chamber and vocal jazz music for small mixed choir including required participation in scheduled mini-tour(s) which may occur during spring break. Prerequisite: Consent of the instructor, based on audition. Corequisite: AUMUS 441. Note: A ★2 course over the full year.

**AUMUS 447 Chamber Ensemble**

★3 (*fi 6*) (two term, 0-0.5L-0). Varies in constitution (e.g., voice and piano, woodwind trio, brass quartet) from year to year. The repertoire to be performed is decided by the students and instructor. The ensemble prepares and performs under the guidance of the instructor. Prerequisite: Consent of the Department. Notes: An "Application for Chamber Ensemble Studies" must be completed and approved before registration in the course. A ★3 course over the full year.

**AUMUS 449 Instrumental Ensemble**

★2 (*fi 4*) (two term, 0-1.5L-0). Includes participation in all scheduled concert events. Prerequisite: Consent of the Department. Notes: An "Application for Instrumental Ensemble Studies" must be completed and approved before registration in the course. A ★2 course over the full year.

**AUMUS 467 Critical Discourse and the Fine Arts**

★3 (*fi 6*) (either term, 0-3s-0). Introduction to Theory and the Fine Arts. A critical study of historical and contemporary issues in the fine arts with an emphasis on themes common to the disciplines of drama, music and the visual arts as cultural processes. Discussions of various theoretical positions including critical and cultural theory, aesthetic theory, disciplinary history and a history of criticism. Prerequisite: Third-year standing. Note: Credit may be obtained for only one of AUMUS 367, 467, AUART 367, 467, AUDRA 367, 467.

**AUMUS 468 Ethnomusicology: Issues and Concepts**

★3 (*fi 6*) (either term, 0-3s-0). Introduction to the discipline of ethnomusicology through the exploration of various related issues, theories and methodologies in regard to "world" and popular music. Topics may include fieldwork methodologies and issues, music and identity, definitions of "tradition", issues of representation and appropriation, music and place, transmission processes, music and gender, the relationship of music to spiritual practices, the impact of contemporary recording technologies, and the intersections of musicology, music theory and ethnomusicology. Prerequisites: AUMUS 170 and third-year standing or consent of the instructor.

**AUMUS 469 Rethorizing Music: From Modernism to Postmodernism**

★3 (*fi 6*) (second term, 0-3s-0). Examination of technical and stylistic perspectives from Modernist art music techniques established before 1950 to those found in art, popular, and world music in the twenty-first century. Included are exercises in composition and performance as well as training in related listening, sight singing, and score-reading skills. Prerequisites: AUMUS 261 and 263.

**AUMUS 475 Co-op Education Studies II**

★1.5 (*fi 3*) (variable, 1-3.5L-0). Placement of a student with an employer organization for work experience. The practicum is designed by the student, supervising faculty member, and supervising organizational director to integrate the liberal arts study of music with work experience in appropriate fields of business, industry, government, and the professions. Prerequisites: Fourth-year standing and consent of the instructor. Note: An Application for Co-op Education Study must be completed and approved before registration in the course.

**AUMUS 476 Directed Studies II**

★3 (*fi 6*) (either term, 1-0-0). Individual research project in a specific area of study as defined by the student and a supervising instructor. Prerequisites: AUMUS 376 and consent of the instructor. Note: An Application for Individual Study must be completed and approved before registration in the course.

**AUMUS 488 Concerto**

★4 (*fi 8*) (two term, 0-1L-0). Private lessons in instrument or voice and the presentation of a complete concerto or, for singers, a work or group of works normally performed with orchestra; one-hour weekly lesson offered over two terms. Prerequisite: Consent of the Department. Note: Restricted to Piano and Voice performance majors in their fourth year. A student should consult the Department of Fine Arts before registering.

**AUMUS 489 Service Playing**

★2 (*fi 4*) (two term, 0-0.5L-0). Private keyboard lessons in the playing of hymns and chants, liturgies, conducting from the keyboard, transcription, improvisations, and transposition; a half-hour lesson weekly over two terms. Prerequisite: Consent of the Department. Notes: Restricted to Liturgical Arts majors. A student should consult the Fine Arts Department before registering.

**AUMUS 490 Applied Music**

★1 (*fi 2*) (either term, 0-0.5L-0). Private lessons in instrument or voice; a half-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to International Program students. A student should consult the Fine Arts Department before registering.

**AUMUS 491 Applied Music**

★2 (*fi 4*) (two term, 0-0.5L-0). Private lessons in instrument or voice; a half-hour weekly lesson over two terms. Prerequisite: Consent of the Department. Notes: A student should consult the Fine Arts Department before registering.

**AUMUS 492 Applied Music**

★1.5 (*fi 3*) (either term, 0-0.75L-0). Private lessons in instrument or voice; a three-quarter-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to International Program students. A student should consult the Fine Arts Department before registering.

**AUMUS 493 Applied Music**

★3 (*fi 6*) (two term, 0-0.75L-0). Private lessons in instrument or voice; a three-quarter-hour weekly lesson over two terms. Prerequisite: Consent of the Department. Notes: A student should consult the Fine Arts Department before registering.

**AUMUS 494 Applied Music**

★2 (*fi 4*) (either term, 0-1L-0). Private lessons in instrument or voice; a one-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to International Program students. A student should consult the Fine Arts Department before registering.

**AUMUS 495 Applied Music**

★4 (*fi 8*) (two term, 0-1L-0). Private lessons in instrument or voice; a one-hour weekly lesson over two terms. Prerequisite: Consent of the Department. Notes: A student should consult the Fine Arts Department before registering.

**AUMUS 496 Performance Studies II**

★3 (*fi 6*) (variable, 0-3L-0). Formal recital (minimum duration: 60 minutes) prepared under the guidance of the instructor and marked by a jury. Prerequisite: Consent of the instructor. Corequisite: AUMUS 495.

**AUMUS 497 Applied Music**

★7 (*fi 14*) (two term, 0-2L-0). Private lessons in instrument or voice and the presentation of a formal recital (minimum duration: 60 minutes) prepared under the guidance of the instructor and marked by a jury. Participation in group master classes is required. Prerequisite: Consent of the Department. Note: This course is restricted to Liturgical Arts, Musical Arts, Piano, and Voice majors in the Bachelor of Music program.

**AUMUS 498 Fundamental Keyboard Skills**

★1 (*fi 2*) (either term, 0-0.5L-0). Private piano lessons; a half-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to students who want to develop specific skills required to pass the Keyboard Skills Proficiency Examination (KSPE), and to International Program students. A student should consult the Fine Arts Department before registering.

**AUMUS 499 Fundamental Keyboard Skills**

★2 (*fi 4*) (two term, 0-0.5L-0). Private piano lessons; a half-hour weekly lesson over two terms. Prerequisite: Consent of the Department. Notes: Restricted to students who want to develop specific skills required to pass the Keyboard Skills Proficiency Examination (KSPE), and to International Program students. A student should consult the Fine Arts Department before registering.

**AUMUS 540 Augustana Choir**

★1.5 (*fi 3*) (second term, 0-4.5L-0). Performance of choral music for mixed choir, including required participation in a performance tour which may follow the winter term. Prerequisite: Consent of instructor based on audition. Notes: a ★1.5 course over the winter term.

**AUMUS 541 Augustana Choir**

★3 (*fi 6*) (two term, 0-4.5L-0). Performance of choral music for mixed choir, including required participation in a performance tour which may follow the winter term. Prerequisite: Consent of the instructor, based on audition. Notes: A ★3 course over the full year.

**AUMUS 542 Choral Ensemble**

★1 (*fi 2*) (first term, 0-2L-0). Performance of choral music. Prerequisite: Consent of Instructor. Notes: a ★1 course over the fall term. The course does not require participation in a performance tour.

**AUMUS 543 Choral Ensemble**

★1 (*fi 2*) (second term, 0-2L-0). Performance of choral music. Prerequisite: Consent of the instructor. Notes: A ★1 course over the winter term. The course does not require participation in a performance tour.

**AUMUS 544 Choral Ensemble**

★2 (*fi 4*) (two term, 0-2L-0). Performance of choral music. Prerequisite: Consent of the instructor. Notes: A ★2 course over the full year. The course does not require participation in a performance tour.

**AUMUS 545 Encore**

★2 (*fi 4*) (two term, 0-3L-0). Performance of traditional chamber and vocal jazz music for small mixed choir including required participation in scheduled mini-tour(s) which may occur during spring break. Prerequisite: Consent of the instructor, based on audition. Corequisite: AUMUS 541. Note: A ★2 course over the full year.

**AUMUS 547 Chamber Ensemble**

★3 (*fi 6*) (two term, 0-0.5L-0). Varies in constitution (e.g., voice and piano, woodwind trio, brass quartet) from year to year. The repertoire to be performed is decided by the students and instructor. The ensemble prepares and performs under the guidance of the instructor. Prerequisite: Consent of the Department. Notes: An "Application for Chamber Ensemble Studies" must be completed and approved before registration in the course. A ★3 course over the full year.

**AUMUS 549 Instrumental Ensemble**

★2 (*fi 4*) (two term, 0-1.5L-0). Includes participation in all scheduled concert events. Prerequisite: Consent of the Department. Notes: An "Application for Instrumental Ensemble Studies" must be completed and approved before registration in the course. A ★2 course over the full year.

**AUMUS 588 Concerto**

★4 (*fi 8*) (two term, 0-1L-0). Private lessons in instrument or voice and the presentation of a complete concerto or, for singers, a work or group of works normally performed with orchestra; one-hour weekly lesson offered over two terms. Prerequisite: Consent of the Department. Note: Restricted to Piano and Voice performance majors in their fifth year. A student should consult the Department of Fine Arts before registering.

**AUMUS 590 Applied Music**

★1 (*fi 2*) (either term, 0-0.5L-0). Private lessons in instrument or voice; a half-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to International Program students. A student should consult the Fine Arts Department before registering.

**AUMUS 591 Applied Music**

★2 (*fi 4*) (two term, 0-0.5L-0). Private lessons in instrument or voice; a three-quarter-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to International Program students. A student should consult the Fine Arts Department before registering.

**AUMUS 592 Applied Music**

★1.5 (*fi 3*) (either term, 0-0.75L-0). Private lessons in instrument or voice; a three-quarter-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to International Program students. A student should consult the Fine Arts Department before registering.

**AUMUS 593 Applied Music**

★3 (*fi 6*) (two term, 0-0.75L-0). Private lessons in instrument or voice; a three-quarter-hour weekly lesson over two terms. Prerequisite: Consent of the Department. Notes: A student should consult the Fine Arts Department before registering.

**AUMUS 594 Applied Music**

★2 (*fi 4*) (either term, 0-1L-0). Private lessons in instrument or voice; a one-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to International Program students. A student should consult the Fine Arts Department before registering.

**AUMUS 595 Applied Music**

★4 (*fi 8*) (two term, 0-1L-0). Private lessons in instrument or voice; a one-hour weekly lesson over two terms. Prerequisite: Consent of the Department. Notes: A student should consult the Fine Arts Department before registering.

**AUMUS 596 Performance Studies II**

★3 (*fi 6*) (either term, 0-3L-0). Formal recital (minimum duration: 60 minutes) prepared under the guidance of the instructor and marked by a jury. Prerequisite: Consent of the instructor. Corequisite: AUMUS 595.

**AUMUS 597 Applied Music**

★7 (*fi 14*) (two term, 0-2L-0). Private lessons in instrument or voice and the presentation of a formal recital (minimum duration: 60 minutes) prepared under the guidance of the instructor and marked by a jury. Participation in group master classes is required. Prerequisite: Consent of the Department. Note: This course is restricted to Liturgical Arts, Musical Arts, Piano, and Voice majors in the Bachelor of Music program.

**AUMUS 598 Fundamental Keyboard Skills**

★1 (*fi 2*) (either term, 0-0.5L-0). Private piano lessons; a half-hour weekly lesson over one term. Prerequisite: Consent of the Department. Notes: Restricted to students who want to develop specific skills required to pass the Keyboard Skills Proficiency Examination (KSPE), and to International Program students. A student should consult the Fine Arts Department before registering.

**AUMUS 599 Fundamental Keyboard Skills**

★2 (*fi 4*) (two term, 0-0.5L-0). Private piano lessons; a half-hour weekly lesson over two terms. Prerequisite: Consent of the Department. Notes: Restricted to students who want to develop specific skills required to pass the Keyboard Skills Proficiency Examination (KSPE), and to International Program students. A student should consult the Fine Arts Department before registering.

## 231.49 Augustana Faculty - Philosophy, AUPHI

Department of Humanities  
Augustana Faculty

### Undergraduate Courses

**AUPHI 101 Introduction to Western Philosophy I: Ancient and Medieval Philosophy**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the main problems and theories that have dominated philosophical thought, through study and critical discussion of selected classics of ancient and medieval philosophy.

**AUPHI 102 Introduction to Western Philosophy II: Modern Philosophy**

★3 (*fi 6*) (either term, 3-0-0). Continuation of an introduction to the main problems and theories that have dominated philosophical thought, through study and critical discussions of selected classics of modern philosophy.

**AUPHI 180 Critical Thinking**

★3 (*fi 6*) (either term, 3-0-0). Elementary methods and principles for distinguishing correct from incorrect reasoning. Topics may include informal fallacies, introduction to the scientific method, elementary formal logic, rational decision procedures, and analysis of arguments.

**AUPHI 200 Metaphysics**

★3 (*fi 6*) (either term, 3-0-0). Examination of traditional and contemporary topics such as Being and Nonbeing, the nature of time, freedom, appearance and reality, persons, and the mind-body problem.

**AUPHI 210 Theory of Knowledge**

★3 (*fi 6*) (either term, 3-0-0). Study of such central topics in epistemology as foundationalism, truth and rationality, skepticism and the limits of knowledge, relativism and the objectivity of knowledge, evidence and verifiability, and belief and justification.

**AUPHI 228 Philosophy Studies and Information Literacy**

★1 (*fi 2*) (either term, 1-0-0). Introduction to library research skills in the discipline of Philosophy. Prerequisite: Second year standing in a Philosophy and Religion degree program. Corequisite: Any senior course in Philosophy that requires library research. Notes: The corequisites must be taken concurrently. Credit may be obtained for only one of AUPHI 228, AUART 228, AUHIS 285, AUREL 228.

**AUPHI 240 Ancient Political Philosophy**

★3 (*fi 6*) (either term, 3-0-0). Historical survey of the development of political and social philosophy, focusing on classical Greece and Rome. Authors studied will include Plato and Aristotle. Note: Credit may be obtained for only one of AUPOL 210 and AUPHI 240.

**AUPHI 241 Modern Political Philosophy**

★3 (*fi 6*) (either term, 3-0-0). Historical and critical survey of the political ideas of modern Europe, from the end of the Renaissance to the end of the 19th century. Authors studied may include Machiavelli, Hobbes, Locke, Rousseau, Wollstonecraft and Marx. Note: Credit may be obtained for only one of AUPOL 211 and AUPHI 241.

**AUPHI 250 History of Christian Thought**

★3 (*fi 6*) (either term, 3-0-0). Survey of the history of Christian thought from its Judaic and Hellenistic origins up to and including the twentieth century.

**AUPHI 260 Ethics**

★3 (*fi 6*) (either term, 3-0-0). Examination of questions of right and wrong, good

and evil, and reasons for action, through study of ethical theories of philosophers such as Plato, Aristotle, Kant, and Mill.

#### **AUPHI 290 Philosophy of Contemporary Culture**

★3 (fi 6) (either term, 3-0-0). Investigation of contemporary culture, both “popular” and “literate” (film, theatre, music, writing).

#### **AUPHI 311 Ancient Greek Philosophy**

★3 (fi 6) (either term, 3-0-0). Survey of ancient Greek philosophy from its origins with the Pre-Socratics up to and including Plato and Aristotle. Prerequisites: AUPHI 101 and 102 preferred, but not necessary. Note: Credit may be obtained for only one of AUPHI 311 and AUCLA 310.

#### **AUPHI 326 Existentialism**

★3 (fi 6) (either term, 3-0-0). Introduction to the main themes and perspectives in recent existential philosophy. Authors such as Kierkegaard, Nietzsche, Sartre, and Heidegger are considered.

#### **AUPHI 336 Nineteenth-Century Philosophy**

★3 (fi 6) (either term, 3-0-0). Main currents of thought of the nineteenth century and the ideological conflicts that our own age has inherited from its predecessors. Particular attention is given to the social and political aspects of the philosophical systems of Hegel, Kierkegaard, Marx, Darwin, and Nietzsche.

#### **AUPHI 340 Contemporary Social and Political Philosophy**

★3 (fi 6) (either term, 3-0-0). Survey of the major formulations and problems of Western social and political thought in the twentieth and twenty-first century, dealing with topics ranging from governance to social relationships. Prerequisite: AUPHI 240 or 241, or consent of the instructor. Note: Credit may be obtained for only one of AUPOL 310, 410 (2010) and AUPHI 340.

#### **AUPHI 350 Philosophy of Science**

★3 (fi 6) (either term, 3-0-0). Philosophical approach to the presuppositions, attitudes, language, practices, and goals of the physical and social sciences. Topics may include theory evaluation, explanation, and the nature of scientific law.

#### **AUPHI 355 Philosophy, Technology, and the Environment**

★3 (fi 6) (either term, 3-0-0). Investigation of the philosophical and social issues related to technology and the environment. The natural/artificial distinction, different senses of “environment” and the ways we understand, package, and manage nature form the foundation of the course. Issues in environmental ethics are also addressed. Thinkers may include Marx, Heidegger, Marcel, Borgmann, Winner, Singer, Regan, and others. Prerequisite: None, but AUPHI 350 would be useful. Note: Credit may be obtained for only one of AUPHI 355 and AUENV 355.

#### **AUPHI 357 Philosophy of Religion I**

★3 (fi 6) (either term, 3-0-0). Introduction to the philosophy of religion by focusing on the question, “What is religion?” Through lectures, discussion, and reading of such thinkers as Schleiermacher, Feuerbach, Kierkegaard, and Otto, the course explores the concept of religion; the existence of God (and related proofs); meaning in religious language; and the relations between faith and reason, philosophy and religion. Prerequisite: None, but AUPHI 102 or 336 would be useful.

#### **AUPHI 358 Philosophy of Religion II**

★3 (fi 6) (either term, 3-0-0). Continuation of the exploration of religion and religious experience undertaken in AUPHI 357. Consideration is given to various forms of spirituality as found in the writings of Christian and non-Christian mystics and religious thinkers such as Eckhart, Shankara, and Starhawk. Prerequisite: AUPHI 357 or consent of the instructor.

#### **AUPHI 365 Aesthetics and Visual Culture**

★3 (fi 6) (either term, 3-0-0). Considerations of theoretical issues related to visual arts, broadly understood - painting, television, video, film, advertising, and photography. Classical theories of the nature of the visual experience, as well as modern and postmodern theories and critiques. Note: Credit may be obtained for only one of AUPHI 365 and AUART 365.

#### **AUPHI 366 Representations of Place and Space**

★3 (fi 6) (either term, 3-0-0). Investigation of concepts and representations in art, architecture, literature and philosophy, of place and space from the Renaissance to the present. Prerequisite: None, but a course in Art history, Philosophy, Geography, or Canadian literature would be helpful. Note: Credit may be obtained for only one of AUPHI 366 and AUART 366.

#### **AUPHI 392 African Philosophy**

★3 (fi 6) (either term, 3-0-0). Aspects of contemporary African philosophy are investigated, including ethnophilosophy, negritude, sage philosophy, nationalistic philosophy, and professional philosophy. Questions of the relationship between philosophy and culture, tradition, reason, language, colonialism and post-colonialism, and community are also addressed. Prerequisite: AUPHI 101 or 102.

#### **AUPHI 420 Hermeneutics**

★3 (fi 6) (either term, 3-0-0). Study of the philosophical theories about the nature of interpretation and understanding. Themes and texts are selected from the writings of Schleiermacher, Dilthey, Heidegger, Gadamer, Ricoeur, Derrida, Foucault, and others.

#### **AUPHI 422 Philosophy, Religion and Public Life Research Seminar I**

★3 (fi 6) (either term, 3-0-0). Preparation of a literature review, research proposal, and presentation of a public life issue that will be explored from philosophical and/or religious perspectives. Research may be participatory archival, or community based. It may include a community service learning component. Classes provide supportive and critical analysis throughout the student’s work and research process. Prerequisite: Third or fourth-year standing. Notes: Open only to students with a major in Philosophy and Religion. This course can be taken only by a student who is also registered in AUPHI 423. Credit may be obtained for only one of AUPHI 422, AUIDS 422 (2009), and AUREL 432.

#### **AUPHI 423 Philosophy, Religion and Public Life Research Seminar II**

★3 (fi 6) (second term, 3-0-0). Continuation of AUPHI 422. This course involves implementing research, presentation of results, and a final writing project. Research may be participatory, archival, or community based. Classes provide supportive and critical analysis throughout the student’s work and research process. Prerequisites: AUPHI 422; third or fourth-year standing. Note: Open only to students with a major in Philosophy and Religion. Credit may be obtained for only one of AUPHI 423, AUIDS 423 (2009), and AUREL 433.

#### **AUPHI 425 Phenomenology**

★3 (fi 6) (either term, 3-0-0). Introduction to the phenomenological method, its history, and its importance for twentieth-century philosophy. Themes and texts are selected from the writings of Husserl, Heidegger, Sartre, Gurwitsch, Schutz, Merleau-Ponty, and others.

#### **AUPHI 459 Philosophy of Western Mysticism**

★3 (fi 6) (either term, 3-0-0). Study of the mystic tradition in the West, including Plotinus, Pseudo-Dionysius, Bonaventure, Eckhart and the Rhineland mystics, Jacob Boehme, and the Kaballah. On the basis of these sources, questions such as the following are addressed: What is the nature of mystical experience? What is mystical “knowledge”? Is mysticism rational? Are there types of mysticism? How can mysticism and morality be related? Prerequisite: AUPHI 357 or consent of the instructor.

#### **AUPHI 490 Selected Topics in the History of Philosophy I**

★3 (fi 6) (either term, 3-0-0). In-depth study of a theme, philosopher, philosophical movement, or philosophical period. Prerequisite: AUPHI 102 or consent of the instructor.

#### **AUPHI 491 Selected Topics in the History of Philosophy II**

★3 (fi 6) (either term, 3-0-0). In-depth study of a theme, philosopher, philosophical movement, or philosophical period. Prerequisite: AUPHI 102 or consent of the instructor.

#### **AUPHI 492 Selected Topics in the History of Philosophy III**

★3 (fi 6) (either term, 3-0-0). In-depth study of a theme, philosopher, philosophical movement, or philosophical period. Prerequisite: AUPHI 102 or consent of the instructor.

#### **AUPHI 493 Selected Topics in the History of Philosophy IV**

★3 (fi 6) (either term, 3-0-0). In-depth study of a theme, philosopher, philosophical movement, or philosophical period. Prerequisite: AUPHI 102 or consent of the instructor.

#### **AUPHI 495 Directed Studies I**

★3 (fi 6) (either term, 3-0-0). Intensive study of a specific area of Philosophy as defined by a student and a supervising instructor. Prerequisites: ★9 at a senior level in Philosophy and consent of the instructor. Note: An “Application for Individual Study” must be completed and approved before registration in the course.

#### **AUPHI 496 Directed Studies II**

★3 (fi 6) (either term, 3-0-0). Intensive study of a specific area of Philosophy as defined by a student and a supervising instructor. Prerequisites: ★9 at a senior level in Philosophy and consent of the instructor. Note: An “Application for Individual Study” must be completed and approved before registration in the course.

#### **AUPHI 497 Directed Studies III**

★3 (fi 6) (either term, 3-0-0). Intensive study of a specific area of Philosophy as defined by a student and a supervising instructor. Prerequisites: ★9 at a senior level in Philosophy and consent of the instructor. Note: An “Application for Individual Study” must be completed and approved before registration in the course.

## 231.50 Augustana Faculty - Physical Activity, AUPAC

Department of Social Sciences  
Augustana Faculty

**Note:** Augustana Faculty AUPAC courses are not equivalent to PAC courses offered in the Faculty of Physical Education and Recreation in credit value or hours of instruction and thus may not be applicable to degree programs offered by that Faculty.



## Undergraduate Courses

### AUPAC 102 Golf

★1 (*fi 2*) (first term, 0-3L-0). An introduction to the fundamental skills (driving, iron play, chipping, pitching and putting) and rules of golf.

### AUPAC 103 Tennis

★1 (*fi 2*) (first term, 0-3L-0).

### AUPAC 109 Cross-Country Skiing

★1 (*fi 2*) (second term, 0-3L-0). Note: Not open to students with credit in AUPED 107 or 108.

### AUPAC 114 Dance

★1 (*fi 2*) (either term, 0-3L-0).

### AUPAC 123 Aquatics

★1 (*fi 2*) (either term, 0-3L-0).

### AUPAC 124 Badminton

★1 (*fi 2*) (either term, 0-3L-0).

### AUPAC 125 Canoeing

★1 (*fi 2*) (first term, 0-3L-0). Note: Not open to students with credit in AUPAC 226.

### AUPAC 131 Curling

★1 (*fi 2*) (second term, 0-3L-0). Note: Credit may be obtained for only one of AUPAC 131 and AUPED 109.

### AUPAC 133 Strength Training

★1 (*fi 2*) (either term, 0-3L-0).

### AUPAC 134 Indoor Climbing

★1 (*fi 2*) (either term, 0-3L-0).

### AUPAC 151 Track and Field

★1 (*fi 2*) (first term, 0-3L-0).

### AUPAC 152 Luge

★1 (*fi 2*) (second term, 0-3L-0).

### AUPAC 161 Gymnastics

★1 (*fi 2*) (either term, 0-3L-0).

### AUPAC 173 Football

★1 (*fi 2*) (first term, 0-3L-0).

### AUPAC 175 Ice Hockey

★1 (*fi 2*) (either term, 0-3L-0). An introduction to the fundamental skills, tactics and rules of ice hockey. Notes: In order to register for this course, a student must be able to skate and must provide their own skates, stick, hockey gloves, helmet, elbow pads and shin pads. Credit may be obtained for only one of AUPAC 175 and AUPED 105.

### AUPAC 177 Soccer

★1 (*fi 2*) (first term, 0-3L-0).

### AUPAC 178 Basketball

★1 (*fi 2*) (either term, 0-3L-0). Note: Credit may be obtained for only one of AUPAC 178 and AUPED 106.

### AUPAC 179 Volleyball

★1 (*fi 2*) (either term, 0-3L-0).

### AUPAC 180 Softball (Fast Pitch)

★1 (*fi 2*) (first term, 0-3L-0).

### AUPAC 181 Team Handball

★1 (*fi 2*) (either term, 0-3L-0).

### AUPAC 209 Advanced Cross-Country Skiing

★1 (*fi 2*) (second term, 0-3L-0). Prerequisite: AUPAC 109. Note: Not open to students with credit in AUPED 207 or 208.

### AUPAC 224 Advanced Badminton

★1 (*fi 2*) (either term, 0-3L-0). Prerequisite: AUPAC 124.

### AUPAC 225 Advanced Canoeing

★1 (*fi 2*) (first term, 0-3L-0). Prerequisite: AUPAC 125.

### AUPAC 226 Moving Water Canoeing: Skill Development

★3 (*fi 6*) (spring/summer, 0-3L-0). Corequisite: AUPED 286. Note: Credit may be obtained for only one of AUPAC 226 and AUPAC 326. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

### AUPAC 253 Advanced Luge

★1 (*fi 2*) (second term, 0-3L-0). Prerequisite: AUPAC 152.

### AUPAC 270 Adventure Games

★1 (*fi 2*) (either term, 0-3L-0).

### AUPAC 277 Advanced Soccer

★1 (*fi 2*) (first term, 0-3L-0). Prerequisite: AUPAC 177.

### AUPAC 278 Advanced Basketball

★1 (*fi 2*) (either term, 0-3L-0). Prerequisite: AUPAC 178. Note: Credit may be obtained for only one of AUPAC 278 and AUPED 206.

### AUPAC 279 Advanced Volleyball

★1 (*fi 2*) (either term, 0-3L-0). Prerequisite: AUPAC 179.

### AUPAC 326 Moving Water Canoeing: Skill and Instructional Development

★3 (*fi 6*) (spring/summer, 0-3L-0). Prerequisite: AUPAC 125 or AUPED 184 or consent of instructor. Credit may be obtained for only one of AUPAC 226 or 326. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

## 231.51 Augustana Faculty - Physical Education, AUPED

Department of Social Sciences  
Augustana Faculty

### Undergraduate Courses

#### AUPED 112 Structural Human Anatomy

★3 (*fi 6*) (either term, 3-0-2). Study of structure and function of selected systems of the human body (skeletal, muscular, circulatory, respiratory, nervous, and others).

#### AUPED 160 Sociocultural Aspects of Sport and Physical Activity

★3 (*fi 6*) (either term, 3-0-0). Introduction to the sociocultural dimensions of sport and physical activity. The course examines a variety of social institutions, processes, issues, and their relationship to sport and physical education in Canada and the United States. Topics include the emergence of modern sport, sport and culture, socialization, class and gender relations, race and ethnicity, government and politics, commercialization, the mass media, schools and universities, drugs and violence.

#### AUPED 184 Introduction to Outdoor Education

★3 (*fi 6*) (either term, 3-0-3). Opportunity for self-awareness and personal and group leadership development through outdoor tripping and small-group living. The skills associated with backpacking, river canoe tripping, and Leave No Trace camping are developed and practised. In addition, educational and recreational use of wilderness and wildlands is examined. Notes: The course requires participation in field trips. A student must furnish his or her own outdoor clothing, footwear, and sleeping bag. Additional fees may be assessed.

#### AUPED 205 Intercollegiate Hockey

★2 (*fi 4*) (two term, 0-6.5L-0). Athletic performance in hockey, including required participation in exhibition and league schedules as well as in competitive tours of the Augustana-based intercollegiate hockey team. Prerequisite: Consent of the Instructor, based on successful completion of the team selection process and AUPED 105. Notes: A ★2 course over the full year. Not open to a part-time student. A student who is placed on disciplinary probation may be required to withdraw from the course. Some tour costs are the responsibility of the student. Augustana Faculty performance-based athletics courses cannot be applied to degree programs offered in the Faculty of Physical Education and Recreation.

#### AUPED 206 Intercollegiate Basketball

★2 (*fi 4*) (two term, 0-9L-0). Athletic performance in basketball, including required participation in exhibition and league schedules as well as in competitive tours of the Augustana-based intercollegiate basketball team. Prerequisite: Consent of the Instructor, based on successful completion of the team selection process and AUPED 106. Notes: A 2-credit course over the full year. Not open to a part-time student. A student who is placed on disciplinary probation may be required to withdraw from the course. Credit may be obtained for only one of AUPED 206 and AUPAC 278. Some tour costs are the responsibility of the student. Augustana Faculty performance-based athletics courses cannot be applied to degree programs offered in the Faculty of Physical Education and Recreation.

#### AUPED 207 Intercollegiate Cross-Country Skiing

★2 (*fi 4*) (two term, 0-8.5L-0). Athletic performance in cross-country skiing, including required participation in exhibition and conference events as well as in competitive tours of the Augustana-based intercollegiate cross-country skiing team. Prerequisite: Consent of the Instructor, based on successful completion of the team selection process and AUPED 107. Notes: A 2-credit course over the full year. Not open to a part-time student. A student who is placed on disciplinary probation may be required to withdraw from the course. Credit may be obtained for only one of AUPED 207 and AUPAC 209. Some tour costs are the responsibility of the student. Augustana Faculty performance-based athletics

courses cannot be applied to degree programs offered in the Faculty of Physical Education and Recreation.

#### **AUPED 208 Competitive Biathlon**

★2 (*fi 4*) (two term, 0-8.5L-0). Athletic performance in biathlon, including required participation in exhibition and provincial schedules as well as in competitive tours of the Augustana biathlon team. Prerequisite: Consent of the Instructor, based on successful completion of the team selection process and AUPED 108. Notes: A 2-credit course over the full year. Not open to a part-time student. A student who is placed on disciplinary probation may be required to withdraw from the course. Credit may be obtained for only one of AUPED 208 and AUPAC 209. Some tour costs are the responsibility of the student. Augustana Faculty performance-based athletics courses cannot be applied to degree programs offered in the Faculty of Physical Education and Recreation.

#### **AUPED 209 Competitive Curling**

★2 (*fi 4*) (two term, 0-4L-0). Athletic performance in curling, including required participation in exhibition and league schedules as well as in competitive tours of the Augustana-based intercollegiate curling team. Prerequisite: Consent of the Instructor, based on successful completion of the team selection process and AUPED 109. Notes: A 2-credit course over the full year. Not open to a part-time student. A student who is placed on disciplinary probation may be required to withdraw from the course. Some costs are the responsibility of the student. Augustana Faculty performance-based athletics courses cannot be applied to degree programs offered in the Faculty of Physical Education and Recreation.

#### **AUPED 215 Introduction to Human Physiology I**

★3 (*fi 6*) (first term, 3-0-0). An introduction to the function of the human body from the cellular to systemic level. All systems will be examined and will include those that meet changing energy demands during physical activity. Prerequisite: AUPED 112.

#### **AUPED 216 Introduction to Human Physiology II**

★3 (*fi 6*) (second term, 3-0-0). A continuation of AUPED 215. Prerequisite: AUPED 215.

#### **AUPED 220 Human Growth and Development**

★3 (*fi 6*) (either term, 3-0-0). Study of the sequential changes in physical growth and motor development with emphasis on individual differences.

#### **AUPED 222 Introduction to Movement Activities of Youth (Ages 5 - 12)**

★3 (*fi 6*) (either term, 3-0-0). Study of a variety of movement activities, including play, games, gymnastics, and dance, in which children participate.

#### **AUPED 232 Introduction to Biomechanics**

★3 (*fi 6*) (either term, 3-0-0). Study of the application of physical laws to movement and structure. Principles of motion, force, and equilibrium are stressed. Various sport skills are examined from a biomechanical perspective. Prerequisite: AUPED 112.

#### **AUPED 241 Lifetime Fitness and Wellness**

★3 (*fi 6*) (either term, 2-2s-0). Study of the theory and practice of adult physical fitness as it relates to health enhancement and preventive medicine. Emphasis is on opportunities to experience a variety of activities potentially capable of enriching lifestyle. Note: Credit may be obtained for only one of AUPED 241 and 245.

#### **AUPED 245 Health and Wellness for Life**

★3 (*fi 6*) (either term, 3-0-0). This course will examine current health issues that influence wellness and healthy living. Students will be introduced to wellness models and theories and will be provided with opportunities to consider and understand personal health decisions. Topics will include: stress management, physical activity, health decision-making, nutrition, chronic disease and environmental health. Note: Credit may be obtained for only one of AUPED 245 and AUPED 241.

#### **AUPED 261 Psychology of Sport**

★3 (*fi 6*) (either term, 3-0-0). Study of the psychological aspects of the competitive sports experience, with emphasis on the multidimensional factors involved in the psychology of sport.

#### **AUPED 262 Sport, Physical Activity, and the Body: Historical Perspectives**

★3 (*fi 6*) (either term, 3-0-0). Examination of major themes in the history of sport, physical activity, and the body. Beginning with the ancient civilizations of Greece and Rome, the course explores the social, cultural, political, philosophical, religious, and economic factors that have influenced sport, physical education, and attitudes toward the body in various time periods. Note: Credit may be obtained for only one of AUPED 262 and AUHIS 212.

#### **AUPED 266 Women in Sport and Physical Activity**

★3 (*fi 6*) (either term, 3-0-0). Biomechanics, physiology, and psychology, along with related concerns of nutrition, injuries, menstrual function, and aging, as they affect women who participate in sport and physical activity. The relationship among sport, femininity, and sexuality is investigated.

#### **AUPED 275 Introduction to Coaching Studies**

★3 (*fi 6*) (either term, 3-0-0). Comprehensive introduction to coaching principles, including sport psychology, training principles, sport pedagogy, ethics, and risk management.

#### **AUPED 285 Winter Outdoor Education**

★3 (*fi 6*) (either term, 3-0-3). Opportunity for self-awareness and personal and group leadership development through outdoor tripping and small-group living. The skills associated with ski touring, travel in avalanche terrain, telemark skiing, and Leave No Trace camping. Prerequisites: One of AUPED 184, 286, and successful completion of a ski competency test. Notes: A student must demonstrate basic competency in skiing (downhill or cross-country). The course requires participation in field trips. A student must furnish his or her own outdoor clothing and sleeping bag. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **AUPED 286 Outdoor Education and Leadership**

★3 (*fi 6*) (spring/summer, variable). Opportunity for self-awareness and personal and group leadership development through extended outdoor tripping and small-group living. The skills associated with intermediate/advanced backpacking, wilderness navigation, white water canoeing, and Leave No Trace camping are developed and practised. Prerequisites: AUPED 184 or equivalent, and consent of the instructor. Corequisite: AUPAC 226 or 326. Notes: The course requires participation in field trips. A student must furnish his or her own outdoor clothing, footwear, and sleeping bag. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **AUPED 290 Studies in Leadership Theory**

★3 (*fi 6*) (either term, 3-0-0). Examination of the current theories, concepts, and issues of leadership. The course provides a student with a foundation for leadership practica.

#### **AUPED 292 Physical Education Practicum**

★3 (*fi 6*) (either term, 1-0-2). Practicum placement to gain awareness and experience in the leadership and instruction of physical education. Prerequisite: AUPED 290 or consent of the instructor. Note: Open only to a student with a major or minor in Physical Education.

#### **AUPED 294 Physical Education Studies and Information Literacy**

★1 (*fi 2*) (either term, 1-0-0). Introduction to Physical Education research skills. Prerequisite: Second-year standing or consent of the instructor. Corequisite: Any senior course in Physical Education that requires library research. Note: The corequisite must be taken concurrently.

#### **AUPED 305 Intercollegiate Hockey**

★2 (*fi 4*) (two term, 0-6.5L-0). Athletic performance in hockey, including required participation in exhibition and league schedules as well as in competitive tours of the Augustana-based intercollegiate hockey team. Prerequisite: Consent of the Instructor, based on successful completion of the team selection process and AUPED 205. Notes: A 2-credit course over the full year. Not open to a part-time student. A student who is placed on disciplinary probation may be required to withdraw from the course. Some tour costs are the responsibility of the student. Augustana Faculty performance-based athletics courses cannot be applied to degree programs offered in the Faculty of Physical Education and Recreation.

#### **AUPED 306 Intercollegiate Basketball**

★2 (*fi 4*) (two term, 0-9L-0). Athletic performance in basketball, including required participation in exhibition and league schedules as well as in competitive tours of the Augustana-based intercollegiate basketball team. Prerequisite: Consent of the Instructor, based on successful completion of the team selection process and AUPED 206. Notes: A 2-credit course over the full year. Not open to a part-time student. A student who is placed on disciplinary probation may be required to withdraw from the course. Some tour costs are the responsibility of the student. Augustana Faculty performance-based athletics courses cannot be applied to degree programs offered in the Faculty of Physical Education and Recreation.

#### **AUPED 307 Intercollegiate Cross-Country Skiing**

★2 (*fi 4*) (two term, 0-8.5L-0). Athletic performance in cross-country skiing, including required participation in exhibition and conference events as well as in competitive tours of the Augustana-based intercollegiate cross-country skiing team. Prerequisite: Consent of the Instructor, based on successful completion of the team selection process and AUPED 207. Notes: A 2-credit course over the full year. Not open to a part-time student. A student who is placed on disciplinary probation may be required to withdraw from the course. Some tour costs are the responsibility of the student. Augustana Faculty performance-based athletics courses cannot be applied to degree programs offered in the Faculty of Physical Education and Recreation.

#### **AUPED 308 Competitive Biathlon**

★2 (*fi 4*) (two term, 0-8.5L-0). Athletic performance in biathlon, including required participation in exhibition and provincial schedules as well as in competitive tours of the Augustana biathlon team. Prerequisite: Consent of the Instructor, based on successful completion of the team selection process and AUPED 208. Notes: A 2-credit course over the full year. Not open to a part-time student. A student who is placed on disciplinary probation may be required to withdraw from the course. Some tour costs are the responsibility of the student. Augustana Faculty performance-based athletics courses cannot be applied to degree programs offered in the Faculty of Physical Education and Recreation.

**AUPED 309 Competitive Curling**

★2 (fi 4) (two term, 0-4L-0). Athletic performance in curling, including required participation in exhibition and league schedules as well as in competitive tours of the Augustana-based intercollegiate curling team. Prerequisite: Consent of the Instructor, based on successful completion of the team selection process and AUPED 209. Notes: A 2-credit course over the full year. Not open to a part-time student. A student who is placed on disciplinary probation may be required to withdraw from the course. Some costs are the responsibility of the student. Augustana Faculty performance-based athletics courses cannot be applied to degree programs offered in the Faculty of Physical Education and Recreation.

**AUPED 314 Exercise Physiology**

★3 (fi 6) (either term, 3-0-2). Study of the physiological response of the human body to acute exercise and to chronic exercise (training). Prerequisite: AUPED 215.

**AUPED 342 Training Methodologies and Athletic Performance**

★3 (fi 6) (either term, 3-0-0). Study of current training and conditioning methodologies used to prepare athletes. The course emphasizes physiological adaptation, specificity, and factors that influence the training process. Prerequisites: AUPED 314. Notes: Open only to a student with a major, or minor in Physical Education.

**AUPED 351 Prevention and Care of Athletic Injuries**

★3 (fi 6) (either term, 3-0-1). Study in the recognition and treatment of athletic injuries and vulnerable body structures, with emphasis on evaluation, modalities of treatment, rehabilitation, and current issues. Prerequisites: AUPED 112 and 215. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**AUPED 360 Hockey: Culture and Commerce**

★3 (fi 6) (either term, 3-0-0). Examination of the cultural and business aspects of the sport of hockey, historically and in the present. The course explores such topics as fan identities, cultural memory and tradition, race and ethnicity, gender and youth culture, labour relations and free agency, salary caps and revenue sharing, minor hockey, audiences and the mass media, fighting and violence, league expansion and franchise relocations, and arena construction. Prerequisites: Third-year standing. Note: Credit may be obtained for only one of AUMGT 360 and AUPED 360.

**AUPED 368 History of Sport in Canada**

★3 (fi 6) (either term, 3-0-0). Examination of the history of sport in Canadian society, from colonial times to the present. The course links developments in sport to wider changes in Canadian society and social relations. Note: Credit may be obtained for only one of AUPED 368 and AUHIS 368.

**AUPED 369 The Modern Olympic Games**

★3 (fi 6) (either term, 3-0-0). Examination of the historical development of the modern Olympic Games. Topics include politics, nationalism, culture, commercialism, media, gender, race and identity. Note: Credit may be obtained for only one of AUPED 369 and AUHIS 312.

**AUPED 370 Selected Topics in Physical Education and Sport**

★3 (fi 6) (either term, 3-0-0). Advanced study of a particular dimension of physical education and sport. Topics vary from year to year, depending on instructor and student interest. Prerequisite: Vary according to topic; second year standing. Note: AUPED 370 is classified as an arts course.

**AUPED 371 Selected Topics in Physical Education and Sport**

★3 (fi 6) (either term, 3-0-0). Advanced study of a particular dimension of physical education and sport. Topics vary from year to year, depending on instructor and student interest. Prerequisite: Vary according to topic; third-year standing. Note: AUPED 371 is classified as an arts course.

**AUPED 372 Selected Topics in Physical Education and Sport**

★3 (fi 6) (either term, 3-0-0). Advanced study of a particular dimension of physical education and sport. Topics vary from year to year, depending on instructor and student interest. Prerequisite: Vary according to topic; third-year standing. Note: AUPED 372 is classified as an arts course.

**AUPED 373 Selected Topics in Physical Education and Sport**

★3 (fi 6) (either term, 3-0-0). Advanced study of a particular dimension of physical education and sport. Topics vary from year to year, depending on instructor and student interest. Prerequisite: Vary according to topic; third-year standing. Note: AUPED 373 is classified as an arts course.

**AUPED 374 Selected Topics in Physical Education and Sport**

★3 (fi 6) (either term, 3-0-0). Advanced study of a particular dimension of physical education and sport. Topics vary from year to year, depending on instructor and student interest. Prerequisite: Vary according to topic; third-year standing. Note: AUPED 374 is classified as a science course.

**AUPED 375 Selected Topics in Physical Education and Sport**

★3 (fi 6) (either term, 3-0-0). Advanced study of a particular dimension of physical education and sport. Topics vary from year to year, depending on instructor and student interest. Prerequisite: Vary according to topic; third-year standing. Note: AUPED 375 is classified as a science course.

**AUPED 383 Programming and Processing the Adventure Experience**

★3 (fi 6) (either term, 3-0-0). Examination of the concepts and theories of adventure program planning and design as well as the concepts and theories of adventure program processing such as briefing and debriefing. Prerequisites: AUPED 389; one of AUPED 184, 285, 286.

**AUPED 387 Arctic Expedition Planning**

★3 (fi 6) (either term, 3-0-0). Study of the many factors involved in extended Arctic canoe expeditions. The course uses an interdisciplinary approach to explore the biological, geographical, historical, and sociological aspects of the Canadian North. Students will plan and prepare for an extended Arctic canoe expedition. Prerequisites: One of AUPED 184, 286; ★3 in Geography and consent of the instructor. Notes: This course is intended to be taken in sequence with AUGEO 343 or AUPED 388. Credit may be obtained for only one of AUGEO 341, 342 and AUPED 387.

**AUPED 388 Arctic Canoe Expedition**

★3 (fi 6) (Spring/Summer, variable). Examination, involving a three- to four-week expedition in the summer, of leadership, group dynamics, risk management, navigation, logistics, wilderness ethics, and other theories and practices associated with extended Arctic canoe expeditions. Prerequisites: AUGEO 341, 342 or AUPED 387; and consent of the instructor(s). Notes: Expedition costs, as well as course tuition, are the student's responsibility. Credit may be obtained for only one of AUGEO 343 and AUPED 388. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**AUPED 389 Foundations of Outdoor, Adventure, and Experiential Education**

★3 (fi 6) (either term, 3-0-0). Examination of the historical and philosophical roots of outdoor, adventure, and experiential education. Prerequisite: One of AUPED 184, 285, 286.

**AUPED 393 Tests and Measurements in Physical Education**

★3 (fi 6) (either term, 3-0-0). Administration, construction, and analysis of tests and measurements utilized in health and physical education. Descriptive and inferential statistics are emphasized.

**AUPED 405 Intercollegiate Hockey**

★2 (fi 4) (two term, 0-6.5L-0). Athletic performance in hockey, including required participation in exhibition and league schedules as well as in competitive tours of the Augustana-based intercollegiate hockey team. Prerequisite: Consent of the Instructor, based on successful completion of the team selection process and AUPED 305. Notes: A 2-credit course over the full year. Not open to part-time students. A student who is placed on disciplinary probation may be required to withdraw from the course. Some tour costs are the responsibility of the student. Augustana Faculty performance-based athletics courses cannot be applied to degree programs offered in the Faculty of Physical Education and Recreation.

**AUPED 406 Intercollegiate Basketball**

★2 (fi 4) (two term, 0-9L-0). Athletic performance in basketball, including required participation in exhibition and league schedules as well as in competitive tours of the Augustana-based intercollegiate basketball team. Prerequisite: Consent of the Instructor, based on successful completion of the team selection process and AUPED 306. Notes: A 2-credit course over the full year. Not open to a part-time student. A student who is placed on disciplinary probation may be required to withdraw from the course. Some tour costs are the responsibility of the student. Augustana Faculty performance-based athletics courses cannot be applied to degree programs offered in the Faculty of Physical Education and Recreation.

**AUPED 407 Intercollegiate Cross-Country Skiing**

★2 (fi 4) (two term, 0-8.5L-0). Athletic performance in cross-country skiing, including required participation in exhibition and conference events as well as in competitive tours of the Augustana-based intercollegiate cross-country skiing team. Prerequisite: Consent of the Instructor, based on successful completion of the team selection process and AUPED 307. Notes: A 2-credit course over the full year. Not open to a part-time student. A student who is placed on disciplinary probation may be required to withdraw from the course. Some tour costs are the responsibility of the student. Augustana Faculty performance-based athletics courses cannot be applied to degree programs offered in the Faculty of Physical Education and Recreation.

**AUPED 408 Competitive Biathlon**

★2 (fi 4) (two term, 0-8.5L-0). Athletic performance in biathlon, including required participation in exhibition and provincial schedules as well as in competitive tours of the Augustana biathlon team. Prerequisite: Consent of the Instructor, based on successful completion of the team selection process and AUPED 308. Notes: A 2-credit course over the full year. Not open to a part-time student. A student who is placed on disciplinary probation may be required to withdraw from the course. Some tour costs are the responsibility of the student. Augustana Faculty performance-based athletics courses cannot be applied to degree programs offered in the Faculty of Physical Education and Recreation.

**AUPED 409 Competitive Curling**

★2 (fi 4) (two term, 0-4L-0). Athletic performance in curling, including required participation in exhibition and league schedules as well as in competitive tours



of the Augustana-based intercollegiate curling team. Prerequisite: Consent of the Instructor, based on successful completion of the team selection process and AUPED 309. Notes: A 2-credit course over the full year. Not open to a part-time student. A student who is placed on disciplinary probation may be required to withdraw from the course. Some costs are the responsibility of the student. Augustana Faculty performance-based athletics courses cannot be applied to degree programs offered in the Faculty of Physical Education and Recreation.

#### AUPED 410 Intercollegiate Athletics

★2 (fi 6) (two term, variable). Athletic performance in competitive Augustana-based intercollegiate hockey, basketball, cross-country skiing, biathlon, or curling, including required participation in exhibition and league schedules and/or exhibition, conference, and provincial events, as well as in competitive tours of the hockey, basketball, cross-country skiing, biathlon, or curling team. Prerequisite: Consent of the instructor, based on successful completion of the team selection process, and one of AUPED 405, 406, 407, 408, or 409. Notes: A ★2 course over the full year. Not open to part-time students. A student who is placed on disciplinary probation may be required to withdraw from the course. Some tour costs are the responsibility of the student. Augustana Faculty performance-based athletics courses cannot be applied to degree programs offered in the Faculty of Physical Education and Recreation.

#### AUPED 414 Advanced Exercise and Occupational Physiology

★3 (fi 6) (either term, 3-0-0). This course, which covers acute and chronic response to exercise, and the underlying mechanisms of adaptation, will extend the students' understanding of exercise physiology. It will also introduce the topic of occupational physiology. The students will have input into the topics selected for presentation and discussion. Topics that may be covered include the influence of exercise in the treatment of various disease states, and the physical requirement of various occupations and occupational testing. Prerequisite(s): AUPED 314. Note: This course was formerly (for 2 years) AUPED 375 (Special Topics in Physical Education and Sport); credit may be obtained for only one of these courses and AUPED 414.

#### AUPED 462 Issues in Physical Education

★3 (fi 6) (either term, 3-0-0). Study of issues as they relate to physical education and athletics. The emphasis is on developing a capability to reason and think critically on issues of importance to the discipline of Physical Education. Prerequisite: ★12 in Physical Education; fourth-year standing.

#### AUPED 469 Sport and Canadian Popular Culture

★3 (fi 6) (either term, 3-0-0). Examination of the role of sport in Canadian popular culture, historically and in the present. Topics include the power of the media to create audiences for sport; the role of sport in the construction of local, regional, and national identities; the continental dimensions of professional sport; the place of sport in the negotiation of gender relations; the use of sport by the Canadian government; and the position of sport in an increasingly global economy and culture.

#### AUPED 490 Directed Study I

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of Physical Education as defined by the student and a supervising instructor. Prerequisites: Third-year standing and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

#### AUPED 491 Directed Study II

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of Physical Education as defined by the student and a supervising instructor. Prerequisites: Third-year standing and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

#### AUPED 492 Directed Study III

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of Physical Education as defined by the student and a supervising instructor. Prerequisites: Third-year standing and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

#### AUPED 493 Introduction to Research in Physical Education

★3 (fi 6) (either term, 3-0-0). Introduction to a set of skills that can be used to better comprehend the research literature and to recognize new questions that need to be researched. Concepts of validity, reliability, experimental design, statistical applications, and construction of proposals and theses are studied. Prerequisite: AUPED 393 and fourth-year standing.

#### AUPED 497 Directed Study IV

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of Physical Education as defined by the student and supervising instructor. Prerequisites: Third-year standing and consent of the instructor. Notes: An "Application for Individual Study" must be completed and approved before registration in the course. AUPED 497 is classified as a science course.

## 231.52 Augustana Faculty - Physics, AUPHY

Department of Science  
Augustana Faculty

The most current Course Listing is available on Bear Tracks.

## Undergraduate Courses

### AUPHY 102 Introductory General Physics I (Mechanics)

★3 (fi 6) (first term, 3-2L-3/2). Noncalculus course in physics for a student without credit in Physics 30. Topics include vectors, forces in equilibrium, linear and rotational motion, dynamics of particles, and oscillations. Prerequisite: One of Pure Mathematics 30 or Mathematics 30-1, consent of the instructor. Notes: AUPHY 102 does not count toward the major in Mathematics and Physics or the minor in Physics. The course is intended to be taken in sequence with AUPHY 106. Credit may be obtained for only one of AUPHY 102, 104, 110.

### AUPHY 104 Introductory General Physics I (Mechanics)

★3 (fi 6) (first term, 3-0-3/2). Content is the same as that of AUPHY 102, but is designed for a student who has credit in Physics 30. Prerequisites: Physics 30; Pure Mathematics 30 or Mathematics 30-1. Notes: The course does not count toward the major in Mathematics and Physics or the minor in Physics. Credit may be obtained for only one of AUPHY 104, 102, 110.

### AUPHY 106 Introductory General Physics II (Wave Motion, Sound, Heat, and Optics)

★3 (fi 6) (second term, 3-0-3/2). Properties of gases, liquids, and solids; wave motion and sound; heat and thermodynamics; geometrical and physical optics. Prerequisite: One of AUPHY 102, 104, 110. Notes: The course does not count toward the major in Mathematics and Physics or the minor in Physics. Credit may be obtained for only one of AUPHY 106, 120.

### AUPHY 110 Mechanics

★3 (fi 6) (either term, 3-0-3/2). Vectors, kinematics, work, energy, momentum, dynamics, and periodic motion. Prerequisites: Physics 30; Pure Mathematics 30 or Mathematics 30-1. Corequisite: AUMAT 110 or 111. Note: Credit may be obtained for only one of AUPHY 110, 102, 104.

### AUPHY 120 Waves, Thermodynamics, and Optics

★3 (fi 6) (either term, 3-0-3/2). Oscillatory motion, waves on a string, sound waves, interference of waves, temperature, heat, entropy, first and second laws of thermodynamics, geometric optics, interference of light. Prerequisites: AUPHY 102 or 104 or 110; AUMAT 110 or 111. Note: Credit may be obtained for only one of AUPHY 120, 106.

### AUPHY 250 Electricity and Magnetism

★3 (fi 6) (either term, 3-0-3/2). Electric fields, Gauss's law, magnetic fields, Ampere's law, Faraday's law, induction, direct and alternating currents. Prerequisites: AUPHY 110 and AUMAT 112.

### AUPHY 260 Introduction to Relativity and Quantum Mechanics

★3 (fi 6) (either term, 3-0-0). Special relativity; photons and matter waves; Bohr atom model; Heisenberg Uncertainty Principle; Schrödinger equation; one-dimensional systems; hydrogen atom; spin; Pauli Exclusion Principle; many-electron atoms; molecules. Prerequisites: AUPHY 120 and AUMAT 112. Corequisite: AUMAT 211. Note: Credit may be obtained for only one of AUPHY 260, AUCHE 277.

### AUPHY 270 Astrophysics

★3 (fi 6) (either term, 3-0-0). The physics of the Universe. Observational methods. Stars, planetary systems, black holes, galaxies. Big Bang cosmology. Prerequisite: AUPHY 120.

### AUPHY 291 Advanced Laboratory I

★3 (fi 6) (either term, 0-0-3). Experiments in classical mechanics and other senior physics topics. Prerequisites: AUPHY 120. Corequisite: Any senior Physics course.

### AUPHY 310 Classical Mechanics

★3 (fi 6) (either term, 4-0-0). Vector calculus, Newtonian mechanics, oscillations, gravitation, Lagrangian and Hamiltonian dynamics. Prerequisites: AUPHY 120 and 250. Corequisites: AUMAT 212; AUMAT 330 is recommended.

### AUPHY 321 Statistical Mechanics and Thermodynamics

★3 (fi 6) (either term, 3-0-0). Microscopic behaviour and quantum states; statistics of small and large systems; internal energy and equipartition; the laws of thermodynamics; thermal, mechanical, and diffusive interactions; introduction to classical and quantum statistics; Gibbs' paradox; Maxwell's relations. Prerequisites: AUPHY 120 and AUMAT 211. Corequisite: AUMAT 212 or 330 is recommended.

### AUPHY 340 Numerical Methods in Physics

★3 (fi 6) (either term, 3-0-1.5). Computer arithmetic and errors, solution of systems of linear equations, root finding, interpolation, numerical quadrature, and numerical solutions of ordinary differential equations. Applications from physics are included. Prerequisite: AUMAT 120. Corequisite: AUPHY 120 or 250, AUMAT 211. Note: Credit may be obtained for only one of AUPHY 340, AUCSC 340, AUMAT 340.

### AUPHY 350 Electromagnetic Theory

★3 (fi 6) (either term, 3-0-0). A vector calculus formulation of electrostatics, magnetostatics, and electrodynamics in free space, and an introduction to electromagnetic waves. Topics include: Lorentz force, Maxwell's equations in differential form, potential formulations, and work, energy, and momentum. Prerequisite: AUPHY 250. Corequisite: AUMAT 212.

<https://www.beartracks.ualberta.ca>

**AUPHY 360 Quantum Mechanics**

★3 (fi 6) (either term, 3-0-0). The breakdown of classical physics. Topics include: wave packets and uncertainty relations, the Schrodinger equation and simple systems, postulates and interpretation of quantum mechanics, operator methods, angular momentum and spin, central force problems and the hydrogen atom. Prerequisites: AUMAT 211; one of AUCHE 277, AUPHY 260. Corequisites: AUPHY 310 and AUMAT 330 are recommended. Note: Credit may be obtained for only one of AUCHE 377, 379 (2008) and AUPHY 360.

**AUPHY 391 Advanced Laboratory II**

★3 (fi 6) (either term, 0-0-3). Experiments in optics, atomic and/or molecular physics, and other senior physics topics. Prerequisite: AUPHY 291. Corequisite: AUPHY 260.

**AUPHY 395 Directed Study**

★3 (fi 6) (either term, 1-0-3). Intensive study of a specific problem or area of physics as defined by the student and a supervising instructor. Notes: Admission to AUPHY 395 normally requires a minimum GPA of 3.0 on the major in Mathematics and Physics. An "Application for Individual Study" must be completed and approved before registration in the course.

**AUPHY 480 History of Physics and Mathematics**

★3 (fi 6) (either term, 3-0-0). Integrated history of mathematics and physics, emphasizing the scientific revolution and the subsequent development of mathematics and physics as distinct disciplines. Prerequisite: AUMAT 211 and one of AUPHY 250, 260, or AUCHE 277. Note: Credit may be obtained for only one of AUPHY 480, 380, AUMAT 380, 480.

**AUPHY 495 Directed Study**

★3 (fi 6) (either term, 1-0-3). Intensive study of a specific problem or area of physics as defined by the student and a supervising instructor. Prerequisite: Fourth-year standing. Notes: Admission to AUPHY 495 normally requires a minimum GPA of 3.0 on the major in Mathematics and Physics. An "Application for Individual Study" must be completed and approved before registration in the course.

## 231.53 Augustana Faculty - Political Studies, AUPOL

Department of Social Sciences  
Augustana Faculty

### Undergraduate Courses

**AUPOL 103 Introduction to Global and Political Studies**

★3 (fi 6) (either term, 3-0-0). Introduction to the ideas and key concepts that comprise the vocabulary of global and political studies. The course considers such ideas as democracy, order, power, authority, justice, freedom, development, globalization and equality. Notes: Credit may be obtained for only one of AUGDS 103 and AUPOL 103.

**AUPOL 104 Introduction to Politics: Processes and Institutions of Government**

★3 (fi 6) (either term, 3-0-0). Introduction to the design and operation of political institutions as well as the electoral and policy processes of liberal-democratic government. Topics include legislatures, executives, constitutions, courts, interest groups, and the media and politics.

**AUPOL 200 The Political Research Process**

★3 (fi 6) (first term, 3-0-0). This course is designed to introduce students to the research process and various methodological approaches within political studies, while helping students to develop research and information literacy skills. Topics include: research design and communication, quantitative and qualitative methods, exploring and assessing sources of information, and various approaches to the study of politics. Prerequisite: AUPOL 103 or AUPOL 104.

**AUPOL 201 Political Studies and Information Literacy**

★1 (fi 2) (either term, 1-0-0). Introduction to library research skills in the discipline of Political Studies. Prerequisite: Second-year standing in a Political Studies degree program. Corequisite: Any senior course in Political Studies that requires library research. Notes: The corequisite must be taken concurrently. Credit may be obtained for only one of AUPOL 201, AUCRI 260, AUSOC 231.

**AUPOL 210 History of Political Thought I**

★3 (fi 6) (either term, 3-0-0). Historical and critical survey of the development of political and social philosophy focusing on classical Greece and Rome, with selected readings from such major political writers as Plato, Aristotle, and Thucydides. Prerequisite: One of AUPOL 103, 104, consent of the instructor. Note: Credit may be obtained for only one of AUPOL 210 and AUPHI 240.

**AUPOL 211 History of Political Thought II**

★3 (fi 6) (either term, 3-0-0). Historical and critical survey of the political ideas of early-modern Europe, with readings from such selected major writers as Hobbes, Locke, Marx, and de Tocqueville. The course treats issues of authority, liberty, property, equality, and democracy. Prerequisite: One of AUPOL 103, 104, 210,

consent of the instructor. Note: Credit may be obtained for only one of AUPOL 210 and AUPHI 241.

**AUPOL 215 Political Ideology**

★3 (fi 6) (either term, 3-0-0). Introduction to the history of political ideas and the movements formed around them from the French Revolution to the present. Included are liberalism, socialism, nationalism, fascism; and contemporary social movements, environmental and otherwise.

**AUPOL 221 Canadian National Government and Politics**

★3 (fi 6) (either term, 3-0-0). Structure and function of the Government of Canada, especially the crown, cabinet, public service, House of Commons, Senate, and judiciary. Prerequisite: One of AUPOL 103, 104, consent of the instructor.

**AUPOL 228 Politics in Alberta**

★3 (fi 6) (either term, 3-0-0). Aspects of politics and governance in Alberta. Emphasis is given to any or all of political economy, political culture, parties and institutions, federal-provincial relations, prairie political ideas, the particular experience of rural Alberta, and comparative study of other prairie and/or resource-based provinces and United States. Prerequisite: One of AUPOL 103, 104, consent of the instructor.

**AUPOL 233 United States Government and Politics**

★3 (fi 6) (either term, 3-0-0). Institutions of the United States government with emphasis on the national level. The course covers the constitution, presidency, Congress, national bureaucracy, judiciary, and public policy-making. Prerequisite: AUPOL 103 or 104.

**AUPOL 239 Cuban Government and Politics**

★3 (fi 6) (second term, 3-0-0). Survey of Cuban state institutions, political ideas, the Organs of Popular Power, the Communist Party of Cuba, and mass organizations. Note: Credit may be obtained for only one of AUPOL 239 and AUSPA 252. The course is available only as part of the Augustana-in-Cuba Program.

**AUPOL 240 Introduction to International Relations I**

★3 (fi 6) (either term, 3-0-0). Introduction to the key themes in the study of relations between states and other key actors engaged in world politics. Students will study the historical evolution of the international system; key theories of international relations; and major institutions such as the United Nations. Prerequisite: One of AUPOL 103, 104, consent of the Instructor.

**AUPOL 241 Introduction to International Relations II**

★3 (fi 6) (either term, 3-0-0). Introduction to the study of international political economy and examination of major issues in world politics. Issues may include: nuclear proliferation; the weaponization of space; development and inequality; terrorism; the regulation of international economic relations; global environmental politics; and the differential experiences of gender and race internationally. Prerequisite: One of AUPOL 240, consent of the Instructor.

**AUPOL 248 Model United Nations/International Organization**

★3 (fi 6) (either term, 3-0-0). Preparation for and participation in a multiple-university, international Model United Nations Assembly or similar competition. Prerequisite: Consent of instructor, by application.

**AUPOL 300 Third-Year Seminar**

★3 (fi 6) (either term, 3-0-0). Seminar organized around one or more concepts central to the study of politics, e.g., power, freedom, security, revolution, nationalism, justice - and approached through classic and contemporary texts as well as films. Prerequisite: Third-year standing.

**AUPOL 310 Contemporary Political Thought**

★3 (fi 6) (either term, 3-0-0). Exploration into the prospects of democratic governance and political community through the reading of selected twentieth and twenty-first century writings. Prerequisites: AUPOL 210 or 211, or consent of the instructor. Note: Credit may be obtained for only one of AUPOL 310, 410 (2010) and AUPHI 340.

**AUPOL 312 Selected Topics in the History of Political Thought**

★3 (fi 6) (either term, 3-0-0). In-depth examination of the texts of a particular theorist or of an issue central to the history of political thought. Topics vary from year to year. Prerequisite: One of AUPOL 210, 211, consent of the instructor.

**AUPOL 324 Selected Topics in Canadian Politics**

★3 (fi 6) (either term, 3-0-0). Advanced study of a particular dimension of Canadian politics. Topics may vary from year to year, depending on instructor and student interest. Prerequisite: AUPOL 221.

**AUPOL 325 Contemporary Issues in the Politics of Native Peoples**

★3 (fi 6) (either term, 3-0-0). Contemporary politics of aboriginal rights and demands for self-government, primarily in Canada, set within the context of traditional conceptions of governance, the history of state policy and legal decisions, and comparative experience in the United States and Mexico.

**AUPOL 327 Canadian Federalism**

★3 (fi 6) (either term, 3-0-0). Analysis of the development and theories of Canadian federalism. Attention is given to current problems of the federal system. Prerequisite: AUPOL 103 or 104.

**AUPOL 328 Environmental Politics**

★3 (fi 6) (either term, 3-0-0). Examination of contemporary debates in, and the evolution of, environmental policy and politics. This course will focus on Canadian issues in a comparative perspective, exploring topics such as environmental political theory, the policy cycle, social movements, international issues, and related case studies. Prerequisite: ★3 credits in either Environmental Studies/ Science or Political Studies. Note: Credit may be obtained for only one of AUPOL 328 and AUENV 328.

**AUPOL 329 Politics and Culture**

★3 (fi 6) (either term, 3-0-0). Drawing on existing work in the areas of political culture, cultural studies and popular culture, this course explores the relationship and tension between politics and culture in western states, with a focus on Canada. Prerequisites: AUPOL 103 or 104.

**AUPOL 341 The Global South and World Politics**

★3 (fi 6) (either term, 3-0-0). Entry of the non-Western world into international relations, economic and political relations between “North” and “South,” and diplomacy in an age of tremendous inequality, cultural diversity, and pressing global problems such as the environment.

**AUPOL 343 Selected Topics in International Political Economy**

★3 (fi 6) (either term, 0-3s-0). Advanced study of a particular dimension of international political economy. Topics may vary from year to year, depending on the instructor and student interest. Prerequisite: One of AUPOL 241, consent of the Instructor.

**AUPOL 344 Selected Topics in International Relations**

★3 (fi 6) (either term, 3-0-0). Topics vary from year to year. The focus is on contemporary issues in world politics. Prerequisite: AUPOL 240 or consent of the instructor.

**AUPOL 345 Canadian Foreign Policy**

★3 (fi 6) (either term, 3-0-0). Introduction to the debates concerning Canada’s place and foreign policy in the contemporary world. Prerequisite: One of AUPOL 103, 240, consent of the instructor.

**AUPOL 346 United States Foreign Policy**

★3 (fi 6) (either term, 3-0-0). United States foreign policy in the postwar era of predominance in international relations, viewed through a range of theoretical perspectives. Prerequisite: One of AUPOL 240, consent of the Instructor.

**AUPOL 348 Model United Nations/International Organization**

★3 (fi 6) (either term, 3-0-0). Preparation for and participation in a multiple-university, international Model United Nations Assembly or similar competition. Prerequisite: Consent of instructor, by application.

**AUPOL 349 Ethics in World Politics**

★3 (fi 6) (either term, 3-0-0). Examination of ethical questions that emerge out of political practice at a time when ideas of global governance, economy, and culture are increasingly commonplace. Subjects may include war, genocide and humanitarian intervention, human rights, refugees, reconciliation in post-conflict societies, the distribution of wealth, citizenship and moral responsibility; and the historic tension between statist-nationalist, cosmopolitan, and other expressions of identity and ethical orientation. Prerequisite: One of AUPOL 240, senior standing in a related discipline, consent of the instructor. Note: Credit may be obtained for only one of AUPOL 349, 449.

**AUPOL 350 Comparative European Politics**

★3 (fi 6) (either term, 3-0-0). Comparative analysis of selected issues in western European politics, focusing on Britain, Germany, and other countries. Prerequisite: AUPOL 103 or 104.

**AUPOL 353 Law, Politics, and the Judicial Process**

★3 (fi 6) (either term, 3-0-0). Examination of the Canadian judicial branch of government in comparative perspective. The course probes court structures; judicial independence, appointment, discipline, and removal; judicial decision making processes; and courts and the public policy process. Prerequisite: One of AUPOL 103, 104, 221, AUCRI 160, AUIDS 160. Note: Credit may be obtained for only one of AUPOL 353 and AUCRI 353.

**AUPOL 355 Gender and Politics**

★3 (fi 6) (either term, 3-0-0). Exploration of the social and political construction of gender and the impact of gender on politics through an examination of gender with regards to one or more of the following areas: representation, social policy, feminist political thought, international relations, development, and/or globalization. Prerequisite: One of AUPOL 103, 104, AUIDS 230.

**AUPOL 357 Selected Topics in Comparative Politics**

★3 (fi 6) (either term, 3-0-0). Advanced study of a particular dimension of comparative politics. Topics may vary from year to year, depending on instructor and student interest. Prerequisite: One of AUPOL 103, 104.

**AUPOL 399 Political Internship**

★3 (fi 6) (either term, 1-0-0). Students have the opportunity to combine work experience with academic study through the development and completion of an internship program related to politics. As part of the internship, students are

required to complete a major research paper related to their work. Prerequisites: Third-year standing in a Political Studies major and consent of the instructor. Notes: Students must develop an internship program and have it approved by a supervisor. Normally, students must also have a GPA of 3.5 or better in Political Studies to be eligible for this course.

**AUPOL 401 Directed Reading I**

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of political studies as defined by the student and a supervising instructor. Prerequisite: Consent of the instructor. Notes: An “Application for Individual Study” must be completed and approved before registration in the course. The course is intended primarily for a student planning to pursue graduate studies.

**AUPOL 402 Directed Reading II**

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of political studies as defined by the student and a supervising instructor. Prerequisites: AUPOL 401 and consent of the instructor. Notes: An “Application for Individual Study” must be completed and approved before registration in the course. The course is intended primarily for a student planning to pursue graduate studies.

**AUPOL 405 Research Seminar**

★3 (fi 6) (two term, 0-1.5s-0). A capstone course for students to conduct in-depth, independent research projects within a seminar setting. The course involves instruction on research methods, building research proposals and conducting research projects, as well as on approaches to the study of politics. Prerequisites: Fourth-year standing in a Political Studies major or consent of the instructor. Note: A three credit course offered over the full year.

**AUPOL 411 International Relations Theory**

★3 (fi 6) (either term, 3-0-0). Critical survey of the principal contemporary theoretical approaches to the study of international politics. Prerequisite: AUPOL 240.

**AUPOL 412 Selected Topics in the History of Political Thought**

★3 (fi 6) (either term, 3-0-0). In-depth examination of the texts of a particular theorist or of an issue central to the history of political thought. Topics vary from year to year. Prerequisite: One of AUPOL 210, 211, consent of the instructor.

**AUPOL 422 The Canadian Charter of Rights and Freedoms**

★3 (fi 6) (either term, 3-0-0). Study of the Canadian Charter and its effect on Canadian politics and government. The course traces the development of Charter jurisprudence and examines the Charter’s effect on federalism, public policy (including criminal law), and political culture. Prerequisite: One of AUPOL 103, 104, 221, AUCRI 160, AUIDS 160. Note: Credit may be obtained for only one of AUPOL 422 and AUCRI 422.

**AUPOL 424 Selected Topics in Canadian Politics**

★3 (fi 6) (either term, 3-0-0). Advanced study of a particular dimension of Canadian politics. Topics may vary from year to year, depending on instructor and student interest. Prerequisite: AUPOL 221.

**AUPOL 443 Selected Topics in International Political Economy**

★3 (fi 6) (either term, 0-3s-0). Advanced study of a particular dimension of international political economy. Topics may vary from year to year, depending on the instructor and student interest. Prerequisite: One of AUPOL 241, consent of the Instructor.

**AUPOL 444 Selected Topics in International Relations**

★3 (fi 6) (either term, 3-0-0). Topics vary from year to year. The focus is on contemporary issues in world politics. Prerequisite: AUPOL 240 or consent of the instructor.

**AUPOL 449 Ethics in World Politics**

★3 (fi 6) (either term, 3-0-0). Examination of ethical questions that emerge out of political practice at a time when ideas of global governance, economy, and culture are increasingly commonplace. Subjects may include war, genocide and humanitarian intervention, human rights, refugees, reconciliation in post-conflict societies, the distribution of wealth, citizenship and moral responsibility; and the historic tension between statist-nationalist, cosmopolitan, and other expressions of identity and ethical orientation. Prerequisite: One of AUPOL 240, senior standing in a related discipline, consent of the instructor. Note: Credit may be obtained for only one of AUPOL 349, 449.

**AUPOL 453 Women and the Law**

★3 (fi 6) (either term, 3-0-0). This course explores historical and contemporary relationships between women and the Canadian legal system. The course uses feminist legal theory to explore the evolution of areas of Canadian law of particular interest to women (for example: reproduction, abortion, family law, rape laws, criminal law) and political activism around the law and women’s issues. Prerequisites: One of AUCRI 353, AUPOL 353, 355 or AUIDS 230. Notes: Credit may be obtained for only one of AUCRI 453 and AUPOL 453.

**AUPOL 455 Ethnicity and Politics**

★3 (fi 6) (either term, 0-3s-0). Exploration of the social and political construction of ethnicity and race through the lens of one or more aspects of ethnic politics, such as nationalism, immigration, multinational states, diasporas, and/or genocide. Prerequisites: One of AUPOL 103, 104; minimum third year standing.



## 231.54 Augustana Faculty - Psychology, AUPSY

Department of Social Sciences  
Augustana Faculty

### Undergraduate Courses

#### AUPSY 101 Basic Psychological Processes

★3 (fi 6) (either term, 3-0-0). Introduction to the discipline of Psychology and its methods. The course focuses on the basic principles underlying human behaviour. Topics include the central nervous system, perception, learning, memory, sleep, and dreams.

#### AUPSY 102 Individual and Social Behaviour

★3 (fi 6) (either term, 3-0-0). Introduction to the discipline of Psychology and its methods. The course focuses on the study of human development, personality, psychological disorders and their treatment, and social psychology.

#### AUPSY 207 Psychology Studies and Information Literacy

★1 (fi 2) (either term, 1-0-0). Introduction to library research skills in the discipline of Psychology. Prerequisite: Second-year standing in a Psychology degree program. Corequisite: Any senior course in Psychology that requires library research. Notes: The corequisite must be taken concurrently. Students are encouraged to take this course in their second year of studies.

#### AUPSY 213 Statistical Methods for Psychological Research

★3 (fi 6) (either term, 3-0-3). Application of statistical methods to psychological problems. Various experimental and non-experimental methods will be introduced. Topics include the scientific method, quantitative research designs, sampling and measuring techniques, biases in experimentation and ethical issues, measures of central tendency and variability, and tests of statistical hypothesis. Students will become familiar with the American Psychological Association (APA) standards of research and writing. Prerequisite: Pure Mathematics 30 or Mathematics 30-1. Note: Credit may be obtained for only one of AUPSY 213, AUSTA 153, 213, 215.

#### AUPSY 220 Personality

★3 (fi 6) (either term, 3-0-0). Introductory survey including representative theoretical points of view and research relevant to the major problems of the study of personality. Prerequisite: AUPSY 102.

#### AUPSY 240 Social Psychology

★3 (fi 6) (either term, 3-0-0). Survey of theories and research on the individual in a social context. Topics may include self presentation, values/attitudes/beliefs, leadership, group dynamics, interpersonal attraction, and aggression. Prerequisite: AUPSY 102.

#### AUPSY 256 Developmental Psychology

★3 (fi 6) (either term, 3-0-0). Biological, cognitive, and social aspects of psychological development, with special emphasis on infancy, childhood, and adolescence. Prerequisite: AUPSY 102.

#### AUPSY 263 Memory and Cognition

★3 (fi 6) (either term, 3-0-0). Introduction to the study of mental processes in memory and cognition. Topics include short- and long-term memory phenomenon, visual attention, consciousness, problem solving and decision making. Prerequisite: AUPSY 101.

#### AUPSY 267 Sensory Processes and Perception

★3 (fi 6) (either term, 3-0-0). An introduction to the theoretical and experimental issues associated with sensory processes and perceptual experience. Prerequisite: AUPSY 101.

#### AUPSY 275 An Introduction to the Brain and Nervous System

★3 (fi 6) (either term, 3-0-0). Introduction to the structure and function of the nervous system, with a special emphasis on the brain. Prerequisite: AUPSY 101.

#### AUPSY 301 Psycholinguistics Seminar

★3 (fi 6) (either term, 0-3s-0). Detailed examination of issues in the psychology of language. The course adopts a seminar style that focuses on discussion, oral presentation, and writing skills. Prerequisites: AUPSY 271 and third-year standing. Note: Open only to a student with a major in Psychology.

#### AUPSY 302 Developmental Seminar

★3 (fi 6) (either term, 0-3s-0). Detailed examination of issues in developmental psychology. The course adopts a seminar style that focuses on discussion, oral presentation, and writing skills. Prerequisites: AUPSY 256 and third-year standing. Note: Open only to a student with a major in Psychology.

#### AUPSY 303 Sleep, Emotion, and Stress: Physiological Psychology Seminar

★3 (fi 6) (either term, 0-3s-0). Detailed examination of issues in physiological psychology. The course adopts a seminar style that focuses on discussion, oral presentation, and writing skills. Prerequisites: AUPSY 275 and third-year standing. Note: Open only to a student with a major in Psychology.

#### AUPSY 304 Personality Seminar

★3 (fi 6) (either term, 0-3s-0). Detailed examination of issues in personality psychology. The course adopts a seminar style that focuses on discussion, oral presentation, and writing skills. Topics include qualitative methods, cross-situational consistency, and the relationship between personality and psychotherapy. Prerequisites: AUPSY 220; third-year standing. Note: Open only to a student with a major in Psychology.

#### AUPSY 308 Social Psychology Seminar

★3 (fi 6) (either term, 0-3s-0). Detailed examination of issues in social/personality psychology. The course adopts a seminar style that focuses on discussion, oral presentation, and writing skills. Topics will survey issues in the areas of social research methodology, attitudes, close relationships, and interpersonal and group processes. Prerequisites: AUPSY 240; third-year standing. Note: Open only to a student with a major in Psychology.

#### AUPSY 310 Qualitative Methods in Psychology

★3 (fi 6) (either term, 3-0-0). Introduction to qualitative methodology in psychology. Topics include: Theoretical foundations of qualitative methods, interviewing, transcribing, and approaches to qualitative analysis. Prerequisite: AUPSY 213.

#### AUPSY 313 Advanced Research Design

★3 (fi 6) (either term, 3-0-0). In this course, students will continue to build upon their existing knowledge of quantitative and qualitative research design. Some topics include: The role of theory in psychological research, critical thinking, advanced topics in quantitative and qualitative design, and integrating methods. Prerequisites: AUPSY 213 and 310.

#### AUPSY 331 Psychological Assessment: Theory and Practice

★3 (fi 6) (either term, 3-0-0). Theory and use of test data in counselling children and adults. Topics include the theory, administration and interpretation of selected tests associated with self-exploration (e.g., personality, psychopathology), intelligence and decision-making (e.g., career choices). Emphasis is placed on the selection and ethical use of tests. Prerequisite: AUPSY 213.

#### AUPSY 338 Intimate Relationships and Human Sexuality

★3 (fi 6) (either term, 3-0-0). A survey of research on intimate relationships and human sexuality from individual and interpersonal perspectives. Topics covered may include methods of sexuality/relationship science, attraction, gender identity, sex roles, sexual orientation, sexual attitudes and behavior, and relationship stresses. Prerequisite: AUPSY 240; third-year standing.

#### AUPSY 342 Health Psychology

★3 (fi 6) (either term, 3-0-0). An overview of theory, research and practice of health psychology and behavioural medicine. Prerequisite: AUPSY 220 or 240.

#### AUPSY 344 Environmental Psychology

★3 (fi 6) (either term, 3-0-0). Systematic study of the dynamic interchange between people and their social and physical environmental contexts. Topics include theories of environmental perception, the effects of crowding, the impact of natural/urban settings, the effects of building design and colours, and managing limited resources. Prerequisite: AUPSY 102; third-year standing. Note: Credit may be obtained for only one of AUENV 344 and AUPSY 344.

#### AUPSY 346 Community Psychology

★3 (fi 6) (either term, 3-0-0). Examination of the theories, approaches, and values behind social intervention intended to ameliorate, or prevent, psychological difficulty. Examples of community change are drawn from a Canadian context whenever possible. Prerequisite: AUPSY 102.

#### AUPSY 348 Industrial and Organizational Psychology

★3 (fi 6) (either term, 3-0-0). An overview of theories and research relevant to understanding human behaviour in the workplace. Prerequisite: AUPSY 240.

#### AUPSY 362 Cognitive Development

★3 (fi 6) (either term, 3-0-0). Survey of the development of memory, perception, conceptual thought, and academic skills from birth through the school years. Prerequisite: AUPSY 256 or 263.

#### AUPSY 363 Social Cognition

★3 (fi 6) (either term, 3-0-0). Examination of human cognition in an applied, social context. Topics covered include social judgment, decision-making, person/group perception, autobiographical memory, motivated cognition, and emotion. Prerequisite: AUPSY 240 or 263.

#### AUPSY 369 Principles of Learning

★3 (fi 6) (second term, 3-0-0). In-depth examination of classical and operant conditioning. Prerequisites: AUPSY 101 and ★3 at a senior level in Psychology.

#### AUPSY 373 Psychology of Language

★3 (fi 6) (either term, 3-0-0). Survey of the production and perception of spoken, signed, and written language. Topics include speech perception, speech production, reading, language acquisition, and language origins. Prerequisite: AUPSY 263. Note: Credit may be obtained for only one of AUPSY 373 and AUPSY 271 (2009).

#### AUPSY 377 Human Neuropsychology

★3 (fi 6) (either term, 3-0-0). Study of changes in mood, motivation, perception,

attention, memory, and cognition, as revealed by structural alterations in the human brain. Prerequisite: AUPSY 275 or consent of the instructor.

#### **AUPSY 382 Family Violence: Dynamics and Prevention**

★3 (fi 6) (either term, 3-0-0). Dynamics and prevention of abuse in the family (i.e., child abuse and couple violence). Topics include theories and controversies, assessment and screening of abuse, psychological consequences of abuse on all family members, and family violence prevention and treatment programs. Prerequisite: AUPSY 240.

#### **AUPSY 391 Directed Reading**

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of psychology as defined by the student and a supervising instructor. Prerequisite: Consent of the Instructor. Notes: An "Application for Individual Study" must be completed and approved before registration in the course. AUPSY 391 is classified as a science course; AUPSY 392 is classified as an arts course.

#### **AUPSY 392 Directed Reading**

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of psychology as defined by the student and a supervising instructor. Prerequisite: Consent of the Instructor. Notes: An "Application for Individual Study" must be completed and approved before registration in the course. AUPSY 391 is classified as a science course; AUPSY 392 is classified as an arts course.

#### **AUPSY 404 Selected Topics in Psychology**

★3 (fi 6) (either term, 3-0-0). Content of each course in this series varies from year to year, but in general it entails either a specific topic of prominent interest in psychology, or a review and discussion of a novel or emerging research area in contemporary psychology. Prerequisite: AUPSY 102. Note: AUPSY 404 is classified as an arts course.

#### **AUPSY 406 Selected Topics in Psychology**

★3 (fi 6) (either term, 3-0-0). Content of each course in this series varies from year to year, but in general it entails either a specific topic of prominent interest in psychology, or a review and discussion of a novel or emerging research area in contemporary psychology. Prerequisite: AUPSY 102. Note: AUPSY 406 is classified as an arts course.

#### **AUPSY 408 History and Systems of Psychology**

★3 (fi 6) (either term, 3-0-0). Survey of major theoretical approaches to psychology, especially in the last two centuries, emphasizing the historical antecedents and contemporary significance of each. Prerequisites: AUPSY 101 or 102, and fourth-year standing. Notes: Open only to a student with a major in Psychology. AUPSY 408 is classified as an arts course.

#### **AUPSY 409 History and Systems of Psychology**

★3 (fi 6) (either term, 3-0-0). Survey of major theoretical approaches to psychology, especially in the last two centuries, emphasizing the historical antecedents and contemporary significance of each. Prerequisites: AUPSY 101 or 102, and fourth-year standing. Notes: Open only to a student with a major in Psychology. AUPSY 409 is classified as a science course.

#### **AUPSY 410 Theoretical and Philosophical Psychology**

★3 (fi 6) (either term, 3-0-0). An introduction to theoretical and philosophical psychology. Topics include: Critical thinking, the role of theory in psychological research, theoretical and methodological pluralism, theory evaluation and integration, and topics from the philosophies of psychology and science. Prerequisites: AUPSY 101 or 102.

#### **AUPSY 426 Psychology of Religion**

★3 (fi 6) (either term, 3-0-0). An in-depth examination of psychological theories and research examining religious thought and behaviour. Topics may include spirituality, religious fundamentalism, religiosity, guilt, forgiveness, morality, mysticism, religious coping and health, conversion, religious socialization, ritual. Prerequisites: One of AUPSY 220, 240; third year standing.

#### **AUPSY 441 Emotion**

★3 (fi 6) (either term, 3-0-0). A survey of theory and research on affect and emotion science. Topics covered may include the history of emotion research, measurement and classification of specific emotions, neurobiology of emotions, cognitive and cultural influences, consequences of emotions/moods, and disorders of emotion. Prerequisite: AUPSY 240 or 275; third year standing.

#### **AUPSY 442 Psychology in a Cultural Context**

★3 (fi 6) (either term, 3-0-0). An examination of cultural differences in psychological processes such as perception, memory, motivation, emotion, values, language, interpersonal relationships and the implications of these differences for cultural interactions. Prerequisites: One of AUPSY 220, 240; third year standing.

#### **AUPSY 448 Political Psychology**

★3 (fi 6) (either term, 3-0-0). An examination of psychological theory and research applied to the political realm. Topics covered may include psychological methods applied to political thought/action, political attitudes, political values and orientations, voter behavior, effects of political campaigning, intergroup relations, motivating collective political movements, and the psychology of terrorism. Prerequisite: AUPSY 240 or 220; third year standing. Note: Students with credit in AUPSY 340 prior to 2010-11 may not obtain credit in AUPSY 448.

#### **AUPSY 471 Language Acquisition**

★3 (fi 6) (either term, 3-0-0). In-depth look at the language acquisition process from birth through the preschool years. The stages of language development are discussed, as well as theoretical issues such as the role of the environment versus genetic predisposition. Prerequisite: AUPSY 373.

#### **AUPSY 477 The Neurobiology of Learning, Memory, and Addiction**

★3 (fi 6) (either term, 3-0-0). Investigation of the neural mechanisms that underlie learning, memory, and addiction. Prerequisite: AUPSY 275.

#### **AUPSY 483 Psychological Disorders**

★3 (fi 6) (either term, 3-0-0). Advanced-level course that focuses on the research related to the etiology, classification, assessment, and treatment of a variety of psychological disorders in children and adults (e.g., anxiety, addictions, depression, schizophrenia, and personality disorders). A student becomes acquainted with the Diagnostic Statistical Manual of Mental Disorders (DSM). Prerequisite: AUPSY 275. AUPSY 486 is highly recommended.

#### **AUPSY 486 Clinical and Counselling Psychology**

★3 (fi 6) (either term, 3-0-0). Overview of the major approaches to counselling, providing the foundation for the counselling process. The student is involved in a variety of experiences in order to understand the basic concepts of each approach. Issues within the counselling profession such as ethical behaviour and career opportunities are also covered. Prerequisites: AUPSY 220 or 256; ★3 in 300 level Psychology. AUPSY 331 or AUPSY 346 is highly recommended.

#### **AUPSY 488 Forensic Psychology**

★3 (fi 6) (either term, 3-0-0). Examination of the psychology of criminal behaviour and the legal system. Topics include theories of criminal behaviour, jury selection and decision-making, police interrogations and confessions, eyewitness testimony, and risk assessment and offender intervention programs. Prerequisite: AUPSY 240. Note: Credit may be obtained for only one of AUPSY 488 and AUCRI 488.

#### **AUPSY 491 Directed Reading**

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of psychology as defined by the student and a supervising instructor. Prerequisite: Consent of the Instructor. Notes: An "Application for Individual Study" must be completed and approved before registration in the course. AUPSY 491 is classified as a science course.

#### **AUPSY 492 Directed Reading**

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of psychology as defined by the student and a supervising instructor. Prerequisite: Consent of the Instructor. Notes: An "Application for Individual Study" must be completed and approved before registration in the course. AUPSY 492 is classified as an arts course.

#### **AUPSY 497 Individual Study I**

★3 (fi 6) (either term, 3-0-0). Literature review and proposal (including an oral report) for fourth-year thesis. Prerequisites: AUPSY 313, fourth-year standing, and consent of the Instructor. Notes: Admission to AUPSY 497 normally requires a grade point average of at least 3.5. An "Application for Individual Study" must be completed and approved before registration in the course. The course is intended for a student planning to pursue graduate studies in Psychology. AUPSY 497 is to be followed by AUPSY 499.

#### **AUPSY 499 Individual Study II**

★3 (fi 6) (either term, 3-0-0). Fourth-year thesis research, report, and oral presentation. Prerequisite: AUPSY 497. Note: Admission to AUPSY 499 normally requires a grade point average of at least 3.5. An "Application for Individual Study" must be completed and approved before registration in the course.

## 231.55 Augustana Faculty - Religion, AUREL

Department of Humanities  
Augustana Faculty

### Undergraduate Courses

#### **AUREL 100 Exploring Religious Meaning**

★3 (fi 6) (either term, 3-0-0). Exploration of religious meaning through the examination of selected themes from Christian theology and from other religions. The themes include ways of conceiving of the divine, the problem of evil, the human predicament, the relationship of religion and society, and ideas of salvation.

#### **AUREL 207 Jesus of Nazareth in Biblical Scholarship**

★3 (fi 6) (either term, 3-0-0). Introduction to religious studies through the interpretation of texts relating to one central figure, Jesus of Nazareth. The course focuses primarily on the Biblical texts about Jesus but also includes other relevant texts from a variety of times and traditions. Note: Credit may be obtained for only one of AUREL 207 and 208.

#### **AUREL 208 Jesus of Nazareth in Contemporary Theology**

★3 (fi 6) (either term, 3-0-0). Introduction to religious studies through an examination

of contemporary theological interpretations of one central figure, Jesus of Nazareth. Note: Credit may be obtained for only one of AUREL 208 and 207.

#### **AUREL 212 Introduction to the Hebrew Bible in Translation**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the history and theology of the Hebrew Bible (Old Testament).

#### **AUREL 216 The Hebrew Prophets**

★3 (*fi 6*) (either term, 3-0-0). Attempt to interpret selected prophets within their historical context. The course explores the relevance of the prophetic mode of analyzing contemporary society.

#### **AUREL 221 Johannine Literature**

★3 (*fi 6*) (either term, 3-0-0). Survey of the distinctive characteristics in structure and content of John's Gospel and letters and the book of Revelation. The course concludes with a comparison of this literature with the rest of the New Testament writings.

#### **AUREL 222 Introduction to the New Testament**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the history and theology of the New Testament.

#### **AUREL 223 Synoptic Gospels**

★3 (*fi 6*) (either term, 3-0-0). Comparative and historical analysis of the purpose, characteristics, and problems of the first three Gospels.

#### **AUREL 226 Pauline Epistles**

★3 (*fi 6*) (either term, 3-0-0). Critical literary, historical, and theological study of the Pauline writings.

#### **AUREL 228 Religious Studies and Information Literacy**

★1 (*fi 2*) (either term, 1-0-0). Introduction to library research skills in the discipline of Religious Studies. Prerequisite: Second year standing in Philosophy and Religion degree program. Corequisite: Any senior course in Religion that requires library research. Note: The corequisite must be taken concurrently. Credit may be obtained for only one of AUREL 228, AUART 228, AUHIS 285, AUPHI 228.

#### **AUREL 235 The Reformation Era**

★3 (*fi 6*) (either term, 3-0-0). Survey of the history of the Reformation from the advocates of reform in the fourteenth century through the Counter-Reformation up to the compilation of the Book of Concord in 1580 with special emphasis on the basic religious questions of that time. The lives and writings of the chief reformers are examined in their historical and cultural contexts, and relationships to common twentieth-century issues are emphasized.

#### **AUREL 241 Basic Themes in Christian Thought**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the basic themes of Christianity. Attention is given to the expression of these themes in the Bible, creedal statements, and contemporary theological literature.

#### **AUREL 247 Theology of Luther**

★3 (*fi 6*) (either term, 3-0-0). Critical study of the genesis, development, and structure of Luther's theology.

#### **AUREL 252 Christian Understanding of Human Nature**

★3 (*fi 6*) (either term, 3-0-0). Survey of the place of human nature in Western thought since the Enlightenment of the eighteenth century, showing the relationship between the development of various non-Christian views and the responses of religious thinkers, primarily Christians. Emphasis is placed on the twentieth century.

#### **AUREL 257 Modern Ethics**

★3 (*fi 6*) (either term, 3-0-0). Contemporary problems in religious ethics and their impact on individual and collective decision-making in the areas of personal and social issues.

#### **AUREL 260 India Tour Orientation**

★3 (*fi 6*) (second term, 3-0-0). Examination of the intersection between religion and development in India. Students research and present on a particular topic relevant to the intersection of religion and development, as well as participate in team building exercises. Issues such as health and safety, travel preparations, dealing with culture shock, and the regional geography of India will be covered. Prerequisite: One of AUREL 100, 283, AUECO 101, consent of the Instructor. Notes: This is a prerequisite course for the India Tour (AUREL 266/AUECO 254). Costs associated with the India Tour (3-weeks) and applicable tuition are the responsibility of the student. Enrolment is limited to 15 students. This course can only be taken by students who also register in AUREL 266/AUECO 254. Credit may be obtained for only one of AUREL 260, 265 (2007), AUECO 252, 253 (2007).

#### **AUREL 262 Spiritual Awareness**

★3 (*fi 6*) (either term, 3-0-0). Examination of the nature and function of religious language that leads to spiritual awareness. Confrontation of two problems in relation to religious language: how to relate the infinite to the finite, and how to relate and discover one's subjective inwardness. Attention is focused on various views regarding the nature of humanity and the human spirit. Special attention is given to the nature and function of parables.

#### **AUREL 263 Spirituality and Globalization**

★3 (*fi 6*) (either term, 3-0-0). Critical investigation of the values and views of

human nature implicit in the discourse of corporate globalization and of those within the alternative visions of Jesus and the Hebrew prophets.

#### **AUREL 266 India Tour**

★3 (*fi 6*) (Spring/Summer, variable). Three-week study tour of India that focuses on a chosen region of India in order to examine the intersection between religious belief and practice and development challenges. Students will be exposed to various development projects as well as an array of religious sites. It is expected that students will gain an in depth understanding of India, its cultural and religious diversity, and the challenges it faces in the 21st century. Students will be exposed to both rural and urban life. Prerequisite: AUREL 260 or AUECO 252. Notes: Costs associated with this India Tour course and applicable tuition are the responsibility of the students. Enrolment is limited to 15 students. Credit may be obtained for only one of AUREL 266 and AUECO 254.

#### **AUREL 270 Selected topics in Religion and Public Life**

★3 (*fi 6*) (either term, 3-0-0). Exploration of several current issues of the intersection of religion and public life and of how various religious traditions engage them.

#### **AUREL 271 Selected Topics in Religion and Public Life**

★3 (*fi 6*) (either term, 3-0-0). Exploration of several current issues of the intersection of religion and public life and of how various religious traditions engage them.

#### **AUREL 272 Selected Topics in Religion and Public Life**

★3 (*fi 6*) (either term, 3-0-0). Exploration of several current issues of the intersection of religion and public life and of how various religious traditions engage them.

#### **AUREL 282 Major Religious Traditions: Middle East**

★3 (*fi 6*) (either term, 3-0-0). Major religious traditions originating in the Middle East: Judaism, Christianity, and Islam.

#### **AUREL 283 Major Religious Traditions: South Asia**

★3 (*fi 6*) (either term, 3-0-0). Major religious traditions of India, China, and Japan: Hinduism, Buddhism, Confucianism, and Taoism.

#### **AUREL 290 Selected Topics in Religion**

★3 (*fi 6*) (either term, 3-0-0). This course covers selected topics in Religion. Topics may vary from year to year depending on the instructor and student interest.

#### **AUREL 291 Selected Topics in Religion**

★3 (*fi 6*) (either term, 3-0-0). This course covers selected topics in Religion. Topics may vary from year to year depending on the instructor and student interest.

#### **AUREL 321 Johannine Literature**

★3 (*fi 6*) (either term, 3-0-0). Survey of the distinctive characteristics in structure and content of John's Gospel and letters and the book of Revelation. The course concludes with a comparison of this literature with the rest of the New Testament writings.

#### **AUREL 335 The Reformation Era**

★3 (*fi 6*) (either term, 3-0-0). Survey of the history of the Reformation from the advocates of reform in the fourteenth century through the Counter-Reformation up to the compilation of the Book of Concord in 1580 with special emphasis on the basic religious questions of that time. The lives and writings of the chief reformers are examined in their historical and cultural contexts, and relationships to common twentieth-century issues are emphasized.

#### **AUREL 345 Religion and Ecology**

★3 (*fi 6*) (either term, 3-0-0). Examination of the relationship between ecology and religion from Christian and non-Christian perspectives. The course looks at ecological spirituality, ecotheology, animal rights, deep ecology, ecoactivism, and ecofeminism. It also devotes substantial time to ecological themes in Asian (Hindu, Buddhist, and Chinese) and traditional (native American and Australian aboriginal) religions. Note: Credit may be obtained for only one of AUREL 345 and ENV 345.

#### **AUREL 347 Theology of Luther**

★3 (*fi 6*) (either term, 3-0-0). Critical study of the genesis, development, and structure of Luther's theology.

#### **AUREL 348 Justice Theologies of the Twentieth Century**

★3 (*fi 6*) (either term, 3-0-0). Examination of modern theologies that focus on the Biblical call for justice and offer a critique of Christianity's alignment with modern culture. These theologies of revitalization and dissent seek to change modern Christendom from within. Among those discussed are liberation, political, ecological, and feminist theologies.

#### **AUREL 349 Contemporary Theology**

★3 (*fi 6*) (either term, 3-0-0). Brief survey of major trends in twentieth-century theology followed by a more in-depth study of one or two major theologians or "schools" of theology.

#### **AUREL 352 Christian Understanding of Human Nature**

★3 (*fi 6*) (either term, 3-0-0). Survey of the place of human nature in Western thought since the Enlightenment of the eighteenth century, showing the relationship between the development of various non-Christian views and the responses of religious thinkers, primarily Christians. Emphasis is placed on the twentieth century.



**AUREL 384 Gods, Goddesses, and Gurus: An Introduction to Hinduism**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the broad range of religious phenomena commonly referred to as "Hinduism," especially as expressed in contemporary India. The course explores the ways Hindus think about and visualize the divine. It examines Hindu sacred texts and popular religious literature, images and stories of the major Hindu gods and goddesses, how the divine is embodied in Hindu holy men and women, and the importance of sacred geography as the basis for religious pilgrimage. It also explores the ways this religious complex is being used by various political movements within India as a vehicle for shaping national identity.

**AUREL 391 Directed Reading in Religion I**

★3 (*fi 6*) (either term, 1-0-0). Intensive study in a specific area of religion as defined by the student and a supervising instructor. Prerequisite: Consent of the Instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUREL 392 Directed Reading in Religion II**

★3 (*fi 6*) (either term, 1-0-0). Intensive study in a specific area of religion as defined by the student and a supervising instructor. Prerequisite: Consent of the Instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUREL 393 Directed Reading in Religion III**

★3 (*fi 6*) (either term, 1-0-0). Intensive study in a specific area of religion as defined by the student and a supervising instructor. Prerequisite: Consent of the Instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUREL 394 Directed Reading in Religion IV**

★3 (*fi 6*) (either term, 1-0-0). Intensive study in a specific area of religion as defined by the student and a supervising instructor. Prerequisite: Consent of the Instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUREL 395 Directed Reading in Religion V**

★3 (*fi 6*) (either term, 1-0-0). Intensive study in a specific area of religion as defined by the student and a supervising instructor. Prerequisite: Consent of the Instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUREL 396 Directed Reading in Religion VI**

★3 (*fi 6*) (either term, 1-0-0). Intensive study in a specific area of religion as defined by the student and a supervising instructor. Prerequisite: ★3 at a senior level in Religion or Consent of the Instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUREL 397 Directed Reading in Religion VII**

★3 (*fi 6*) (either term, 1-0-0). Intensive study in a specific area of religion as defined by the student and a supervising instructor. Prerequisite: ★3 at a senior level in Religion or Consent of the Instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUREL 398 Directed Reading in Religion VIII**

★3 (*fi 6*) (either term, 1-0-0). Intensive study in a specific area of religion as defined by the student and a supervising instructor. Prerequisite: ★3 at a senior level in Religion or Consent of the Instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUREL 399 Directed Reading in Religion IX**

★3 (*fi 6*) (either term, 1-0-0). Intensive study in a specific area of religion as defined by the student and a supervising instructor. Prerequisite: ★3 at a senior level in Religion or Consent of the Instructor. Note: An "Application for Individual Study" must be completed and approved before registration in each of these courses.

**AUREL 400 Selected Topics in Religion**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, periods, works, methodologies, theological genres, and religious themes. Focus and content of each course are determined by student and faculty interests, and vary from year to year.

**AUREL 401 Selected Topics in Religion**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, periods, works, methodologies, theological genres, and religious themes. Focus and content of each course are determined by student and faculty interests, and vary from year to year.

**AUREL 402 Selected Topics in Religion**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, periods, works, methodologies, theological genres, and religious themes. Focus and content of each course are determined by student and faculty interests, and vary from year to year.

**AUREL 403 Selected Topics in Religion**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, periods, works, methodologies, theological genres, and religious themes. Focus and content of each course are determined by student and faculty interests, and vary from year to year.

**AUREL 404 Selected Topics in Religion**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, periods, works, methodologies, theological genres, and religious themes. Focus and content of each course are determined by student and faculty interests, and vary from year to year.

**AUREL 405 Selected Topics in Religion**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, periods, works, methodologies, theological genres, and religious themes. Focus and content of each course are determined by student and faculty interests, and vary from year to year.

**AUREL 406 Selected Topics in Religion**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, periods, works, methodologies, theological genres, and religious themes. Focus and content of each course are determined by student and faculty interests, and vary from year to year.

**AUREL 407 Selected Topics in Religion**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, periods, works, methodologies, theological genres, and religious themes. Focus and content of each course are determined by student and faculty interests, and vary from year to year.

**AUREL 408 Selected Topics in Religion**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, periods, works, methodologies, theological genres, and religious themes. Focus and content of each course are determined by student and faculty interests, and vary from year to year.

**AUREL 409 Selected Topics in Religion**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, periods, works, methodologies, theological genres, and religious themes. Focus and content of each course are determined by student and faculty interests, and vary from year to year.

**AUREL 410 Selected Topics in Religion**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, periods, works, methodologies, theological genres, and religious themes. Focus and content of each course are determined by student and faculty interests, and vary from year to year.

**AUREL 411 Selected Topics in Religion**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, periods, works, methodologies, theological genres, and religious themes. Focus and content of each course are determined by student and faculty interests, and vary from year to year.

**AUREL 412 Selected Topics in Religion**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, periods, works, methodologies, theological genres, and religious themes. Focus and content of each course are determined by student and faculty interests, and vary from year to year.

**AUREL 413 Selected Topics in Religion**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, periods, works, methodologies, theological genres, and religious themes. Focus and content of each course are determined by student and faculty interests, and vary from year to year.

**AUREL 432 Philosophy, Religion Public Life Research Seminar I**

★3 (*fi 6*) (first term, 3-0-0). Preparation of a literature review, research proposal, and presentation of a public life issue that will be explored from philosophical perspectives. Research may be participatory, archival or community based. It may include a community service learning component. Classes provide supportive and critical analysis throughout the student's work and research process. Prerequisite: Third or fourth-year standing. Notes: Only open to students with a major in Philosophy and Religion. This course can be taken only by a student who is also registered in AUREL 433. Credit may be obtained for only one of AUPHI 422, AUIDS 422 (2009) and AUREL 432.

**AUREL 433 Philosophy, Religion Public Life Research Seminar II**

★3 (*fi 6*) (second term, 3-0-0). Continuation of AUREL 432. This course involves implementing research, presentation of results, and a final writing project. Research may be participatory, archival or community based. Classes provide supportive and critical analysis throughout the student's work and research process. Prerequisite: AUREL 432, third or fourth-year standing. Notes: Only open to students with a major in Philosophy and Religion. Credit may be obtained for only one of AUPHI 423, AUREL 423 (2009) and AUREL 433.

## 231.56 Augustana Faculty - Scandinavian, AUSCA

Department of Humanities  
Augustana Faculty

### Undergraduate Courses

#### AUSCA 101 Beginners' Norwegian I

★3 (fi 6) (first term, 4-0-0). AUSCA 101 and 102 are designed to develop ability in reading and writing Norwegian, with a strong emphasis on the development of comprehension and oral communication skills. During this process, the student participates in a wide variety of interactive activities and is also exposed to contemporary Norwegian culture. These two courses not only encourage the student to think critically about the principles of grammar as they relate to the Norwegian language, but also stimulate an in-depth understanding of the principles by which language functions in general. These two courses also lead the student through the steps of reflective learning as he or she considers and discusses language learning strategies.

#### AUSCA 102 Beginners' Norwegian II

★3 (fi 6) (second term, 4-0-0). Continuation of AUSCA 101. Prerequisite: AUSCA 101.

#### AUSCA 141 Viking-Age Prose Literature

★3 (fi 6) (either term, 3-0-0). Selected family and historical sagas (Njal's saga, Egil's saga, Grettir's saga, Laxdæla saga, the Vinland sagas, and others), and an introduction to Viking-age history. All lectures and readings are in English.

#### AUSCA 151 Modern Norwegian Literature

★3 (fi 6) (either term, 3-0-0). Dramas of Ibsen and representative prose works (e.g. Hamsun, Undset). All lectures and readings are in English.

#### AUSCA 152 Modern Danish and Swedish Literature

★3 (fi 6) (either term, 3-0-0). Dramas of Strindberg and representative prose works (e.g., Andersen, Jacobsen, and Lagerkvist). All lectures and readings are in English.

#### AUSCA 161 Scandinavian Folk Literature

★3 (fi 6) (either term, 3-0-0). Introduction to the three major genres of Scandinavian folk literature: the fictional folk tale, the legend, and the ballad. Folk literature as a cultural mirror and the impact of folk literature on nineteenth- and twentieth-century Scandinavian literature are also explored. All lectures and readings are in English.

#### AUSCA 201 Intermediate Norwegian I

★3 (fi 6) (first term, 4-0-0). Reading and study of selected texts in Norwegian literature and culture. Composition and conversation are emphasized. Prerequisite: AUSCA 102 or Consent of the Instructor.

#### AUSCA 202 Intermediate Norwegian II

★3 (fi 6) (second term, 4-0-0). Continuation of AUSCA 201. Prerequisite: AUSCA 201.

#### AUSCA 210 Scandinavian Studies and Information Literacy

★1 (fi 2) (either term, 1-0-0). Introduction to library research skills in the discipline of Scandinavian Studies. Prerequisite: Second-year standing in a Modern Languages degree program. Corequisite: Any senior course in Scandinavian Studies that requires library research. Notes: The corequisite must be taken concurrently. Credit may be obtained for only one of AUSCA 210, AUENG 204, AUDRA 228, AUFRE 210, AUGER 210.

#### AUSCA 221 Representations of Gender in Modern Scandinavian Literature

★3 (fi 6) (either term, 3-0-0). An analysis of the representations of gender in selected works of Scandinavian literature in English translation from 1850 to the present, as well as the role that gender has played in Scandinavian literature in general. Feminist literary and gender theory will be employed to analyze the various texts.

#### AUSCA 231 Scandinavian Culture and Civilization

★3 (fi 6) (either term, 3-0-0). Survey of Scandinavian life and achievement, past and present, with emphasis on social and cultural conditions against a geographical and historical background. All lectures and readings are in English. Note: Credit may be obtained for only one of AUSCA 231 and AUGEO 242.

#### AUSCA 234 Selected Topics in Scandinavian Languages

★3 (fi 6) (either term, 3-0-0). Study of selected topics in Scandinavian languages studies. Focus and content of each course will vary from year to year.

#### AUSCA 235 Selected Topics in Scandinavian Languages

★3 (fi 6) (either term, 3-0-0). Study of selected topics in Scandinavian languages studies. Focus and content of each course will vary from year to year.

#### AUSCA 237 Selected Topics in Scandinavian Literature

★3 (fi 6) (either term, 3-0-0). Study of selected topics in Scandinavian literature. Focus and content of each course will vary from year to year.

#### AUSCA 239 Selected Topics in Scandinavian Literature

★3 (fi 6) (either term, 3-0-0). Study of selected topics in Scandinavian literature. Focus and content of each course will vary from year to year.

#### AUSCA 241 Viking-Age Prose Literature

★3 (fi 6) (either term, 3-0-0). Selected family and historical sagas (Njal's saga, Egil's saga, Grettir's saga, Laxdæla saga, the Vinland sagas, and others), and an introduction to Viking-age history. All lectures and readings are in English.

#### AUSCA 251 Modern Norwegian Literature

★3 (fi 6) (either term, 3-0-0). Dramas of Ibsen and representative prose works (e.g. Hamsun, Undset). All lectures and readings are in English.

#### AUSCA 252 Modern Danish and Swedish Literature

★3 (fi 6) (either term, 3-0-0). Dramas of Strindberg and representative prose works (e.g., Andersen, Jacobsen, and Lagerkvist). All lectures and readings are in English.

#### AUSCA 261 Scandinavian Folk Literature

★3 (fi 6) (either term, 3-0-0). Introduction to the three major genres of Scandinavian folk literature: the fictional folk tale, the legend, and the ballad. Folk literature as a cultural mirror and the impact of folk literature on nineteenth- and twentieth-century Scandinavian literature are also explored. All lectures and readings are in English.

#### AUSCA 271 Personal Narratives of the North

★3 (fi 6) (either term, 3-0-0). Analysis of personal narratives from the Canadian North and northern Scandinavia, with a focus on texts linking these regions. Narratives written from a variety of perspectives are read, including those of aboriginal peoples, explorers, professionals, adventurers and families. Texts which explore gender roles and gender myths in the North are also examined. Autobiographical theory is employed to analyze the texts. All lectures and readings are in English.

#### AUSCA 334 Selected Topics in Scandinavian Languages

★3 (fi 6) (either term, 3-0-0). Study of selected topics in Scandinavian languages studies. Focus and content of each course will vary from year to year.

#### AUSCA 335 Selected Topics in Scandinavian Languages

★3 (fi 6) (either term, 3-0-0). Study of selected topics in Scandinavian languages studies. Focus and content of each course will vary from year to year.

#### AUSCA 337 Selected Topics in Scandinavian Literature

★3 (fi 6) (either term, 3-0-0). Study of selected topics in Scandinavian literature. Focus and content of each course will vary from year to year.

#### AUSCA 339 Selected Topics in Scandinavian Literature

★3 (fi 6) (either term, 3-0-0). Study of selected topics in Scandinavian literature. Focus and content of each course will vary from year to year.

#### AUSCA 371 Eighteenth- and Nineteenth-Century Scandinavian Prose and Drama

★3 (fi 6) (either term, 3-0-0). Scandinavian prose and drama from 1720 to the beginning of Expressionism, in the original languages. Special emphasis is placed on Holberg's comedies, Ibsen's social dramas, Bjørnson's peasant novels, Realism, Naturalism, and Neo-Romanticism. Prerequisite: AUSCA 202 or Consent of the Instructor.

#### AUSCA 372 Eighteenth- and Nineteenth-Century Scandinavian Poetry and Short Stories

★3 (fi 6) (either term, 3-0-0). Scandinavian poetry and short prose forms from 1720 to the beginnings of Expressionism, in the original languages. Special emphasis is placed on Det Norske Selskab, Carl M. Bellman, Norwegian National Romanticism, Andersen's fairy tales, post-Romantic poetry in Sweden, and symbolist poetry in Denmark. Prerequisite: AUSCA 202 or Consent of the Instructor.

#### AUSCA 381 Modern Scandinavian Prose and Drama

★3 (fi 6) (either term, 3-0-0). Scandinavian prose and drama from 1900 to the present in the original languages. Special emphasis is placed on Strindberg's plays, and novels by Undset, Hoel, Sandemose, Vesaas, Martin A. Hansen, Sven Delblanc, and others. Prerequisite: AUSCA 202 or Consent of the Instructor.

#### AUSCA 382 Modern Scandinavian Poetry and Short Stories

★3 (fi 6) (either term, 3-0-0). Scandinavian poetry, short stories, and essays from 1900 to the present in the original languages, including Arnulf Øverland, Rolf Jacobsen, Inger Hagerup, Otto Gelsted, Benny Andersen, Nels Ferlin, Edith Södergrän, and others. Prerequisite: AUSCA 202 or Consent of the Instructor.

#### AUSCA 401 Directed Study: Language

★3 (fi 6) (either term, 1-0-0). Intensive study of the Norwegian language. Prerequisite: AUSCA 202 or Consent of the Instructor. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

#### AUSCA 403 Directed Reading

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of Scandinavian literature as defined by the student and a supervising instructor. Prerequisite: A 200-level Scandinavian literature course or Consent of the Instructor. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

**AUSCA 405 Directed Study: Area Studies**

★3 (*fi 6*) (either term, 1-0-0). Intensive study of a specific area of Scandinavian culture as defined by the student and a supervising instructor. Prerequisite: AUSCA 231. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

## 231.57 Augustana Faculty - Sociology, AUSOC

Department of Social Sciences  
Augustana Faculty

### Undergraduate Courses

**AUSOC 101 Introducing Sociology: Principles and Practice**

★3 (*fi 6*) (either term, 3-0-0). Introduction to sociology focusing on understanding the relation between the individual and society using concepts like social control, class, role, self, reference group, ideology, and world view. Through the use of some popular films, specific attention is paid to understanding the way we (as particular individuals) are, in taken-for-granted ways, shaped by our membership in large and small groupings. The implications of this shaping for our ideas of freedom, individuality, and morality are debated and examined.

**AUSOC 103 Introducing Sociology: Institutions and Insight**

★3 (*fi 6*) (either term, 3-0-0). Introduction to sociology focusing on the relation between social institutions and everyday life. Through an examination of institutions like law, family, education, politics, religion, and economy, the course develops an understanding of themes such as changes in family organization, the relation between delinquency and power, and the relation between religion and economy. Prerequisite: AUSOC 101 or 105.

**AUSOC 105 Social Anthropology**

★3 (*fi 6*) (either term, 3-0-0). Ethnographic materials from non-Western societies are utilized to examine culture, social structure, and social process. Particular attention is paid to everyday life within various types of societies and how sociological ways of knowing are enriched by an attentiveness to cross-cultural research.

**AUSOC 200 Young Offenders and the Law**

★3 (*fi 6*) (either term, 3-0-0). Integrative examination of theories of delinquency, the relationship of the young offender to Canadian criminal law, family, drug abuse, child abuse, and recent developments in community-based treatment programs. Note: Credit may be obtained for only one of AUSOC 200 and AUCRI 200.

**AUSOC 218 Sociology of Global and Development Issues**

★3 (*fi 6*) (either term, 3-0-0). Introductory exploration of the issues of global economic development, global wealth and poverty, and global inequality. Alternative theoretical perspectives are introduced. Prerequisite: One of AUSOC 101, 103, 105. Notes: Credit may be obtained for only one of AUSOC 218, and AIDS 121, 221.

**AUSOC 222 Canadian Social Issues**

★3 (*fi 6*) (either term, 3-0-0). Introduction to sociological perspectives on social problems. Various theoretical orientations are applied to contemporary Canadian social issues such as poverty, gender issues, aboriginal rights, human sexuality, and regionalism. Note: Credit may be obtained for only one of AUSOC 222 and AUCRI 222.

**AUSOC 224 Sociology of Deviant Behaviour**

★3 (*fi 6*) (either term, 3-0-0). Interactionist analysis of processes accompanying the definition of deviance, subculture formation, careers of involvement in deviant activities, and the formal and informal regulation of deviance. Prerequisite: One of AUSOC 101, 103, 105. Note: Credit may be obtained for only one of AUSOC 224 and AUCRI 224.

**AUSOC 225 Criminology: A Canadian Perspective**

★3 (*fi 6*) (either term, 3-0-0). Examination of sociological explanations of crime and criminality. The course focuses on criminality as defined under Canadian criminal law and the traditional legal systems of Canada's aboriginal peoples. Prerequisite: One of AUSOC 101, 103, 105. Note: Credit may be obtained for only one of AUSOC 225 and AUCRI 225.

**AUSOC 231 Sociological Studies and Information Literacy**

★1 (*fi 2*) (either term, 1-0-0). Introduction to library research skills in the discipline of Sociology. Prerequisite: Second-year standing in a Sociology degree program. Corequisite: Any senior Sociology course that requires library research. Notes: The corequisite must be taken concurrently. Credit may be obtained for only one of AUSOC 231, AUCRI 260, AUPOL 201.

**AUSOC 232 Theoretic Developments in Sociology I**

★3 (*fi 6*) (either term, 3-0-0). Survey of the origin and the development of classical sociological theory, with particular emphasis on Marx, Durkheim, and Weber. Prerequisite: One of AUSOC 101, 103, 105.

**AUSOC 233 Theoretic Developments in Sociology II**

★3 (*fi 6*) (either term, 3-0-0). Survey of the contributions of modern and

contemporary sociological theorists, particularly Weber, Parsons, Mead, and others. Prerequisite: One of AUSOC 101, 103 or 105; and AUSOC 232.

**AUSOC 236 Research Design and Qualitative Methods**

★3 (*fi 6*) (either term, 3-0-0). Examination of the relation between the method of inquiry and the problem which inquiry addresses. It is designed to acquaint students with numerous approaches to social research, covering all phases of the research process including formulation of a research problem, design of instruments, collection of data and analysis of results. Particular attention is given to qualitative methods, including interviewing, observation, focus groups, and unobtrusive measures. Students will be expected to conduct original research assignments. Prerequisite: One of AUSOC 101, 103, 105.

**AUSOC 262 Mass Communication and Contemporary Society**

★3 (*fi 6*) (either term, 3-0-0). What kind of communication is mass communication, and in what ways in particular is this different from other forms of communication? What does it mean to live in an age of mass culture? The construction and character of mass society as one organizational and communicative possibility, using notions of postmodernism and post-industrialism. Prerequisite: ★3 at a senior level in Sociology or consent of the instructor.

**AUSOC 263 The Social Theory of Community**

★3 (*fi 6*) (either term, 3-0-0). Inquiry into the nature of the social, moral, and theoretic ground of human communities, taking as its starting point an examination of the sociological research on the urban/rural difference. Involved in this is an examination of the kinds of social theories that best help us understand the nature of community. For all of the above, Canada is the case study. Prerequisite: One of AUSOC 101, 103, 105, consent of the instructor.

**AUSOC 267 Knowledge and Human Society**

★3 (*fi 6*) (either term, 3-0-0). Nature and assessment of knowledge (e.g., values and belief systems manifest in art, science, technology) in the context of social systems; the connection between competing systems of knowledge and social change. Prerequisite: One of AUSOC 101, 103, 105.

**AUSOC 271 The Family**

★3 (*fi 6*) (either term, 3-0-0). Examination of the Western family from ancient Hebrew to contemporary times. It involves the study of the development of the modern nuclear family organization and the controversy over its demise. The relation of the family to wider social structures and society is also considered. Prerequisite: One of AUSOC 101, 103, 105, consent of the instructor.

**AUSOC 275 Sex, Gender, and Society**

★3 (*fi 6*) (either term, 3-0-0). Examination of the relation between gender as a social institution and our experiences of sexual identity and gender. The way gender differences are constructed and sustained as part of the reality of everyday life is also examined. Prerequisite: One of AUSOC 101, 103, 105, consent of the instructor.

**AUSOC 279 Women in Contemporary Cuba**

★3 (*fi 6*) (second term, 3-0-0). Sociological examination of the life of women in contemporary Cuba, focusing on the experience of women within families, workplaces, and education. Note: Credit may be obtained for only one of AUSOC 279 and AUSPA 253. The course is available only as part of the Augustana-in-Cuba Program.

**AUSOC 283 Sociology of Religion**

★3 (*fi 6*) (either term, 3-0-0). Examination of sociological approaches to religion. Religiously grounded moral claims are examined relative to the social functions of religion, religion in relation to other social institutions, and religious experience in everyday life. Prerequisite: One of AUSOC 101, 103, 105.

**AUSOC 301 Directed Reading I**

★3 (*fi 6*) (either term, 1-0-0). Intensive study of a specific area of sociology as defined by the student and a supervising instructor. Prerequisite: Consent of the instructor. Notes: An "Application for Individual Study" must be completed and approved before registration in the course. The course is intended primarily for a student planning to pursue graduate studies in sociology.

**AUSOC 302 Directed Reading II**

★3 (*fi 6*) (either term, 1-0-0). Intensive study of a specific area of sociology as defined by the student and a supervising instructor. Prerequisites: AUSOC 301 or 401, and consent of the instructor. Notes: An "Application for Individual Study" must be completed and approved before registration in the course. The course is intended primarily for a student planning to pursue graduate studies in sociology.

**AUSOC 303 Selected Topics in Sociology**

★3 (*fi 6*) (two term, 3-0-0). Study of selected topics at an advanced level that allows for a focus that is both specific and deep. Prerequisites: Two of AUSOC 101, 103, 105; and Consent of the Instructor.

**AUSOC 304 Selected Topics in Sociology**

★3 (*fi 6*) (either term, 3-0-0). Study of selected topics at an advanced level that allows for a focus that is both specific and deep. Prerequisites: Two of AUSOC 101, 103, 105; and consent of the instructor.



**AUSOC 305 Selected Topics in Sociology**

★3 (fi 6) (either term, 3-0-0). Study of selected topics at an advanced level that allows for a focus that is both specific and deep. Prerequisites: Two of AUSOC 101, 103, 105; and consent of the instructor.

**AUSOC 306 Selected Topics in Sociology**

★3 (fi 6) (either term, 3-0-0). Study of selected topics at an advanced level that allows for a focus that is both specific and deep. Prerequisites: Two of AUSOC 101, 103, 105; and consent of the instructor.

**AUSOC 307 Directed Research I**

★3 (fi 6) (either term, 1-0-0). Original research project as developed by the student and supervising instructor. Prerequisite: Consent of the instructor. Notes: An "Application for Individual Study" must be completed and approved before registration in the course. The course is intended primarily for a student planning to pursue graduate studies in sociology.

**AUSOC 308 Directed Research II**

★3 (fi 6) (either term, 1-0-0). Original research project as developed by the student and supervising instructor. Prerequisite: Consent of the instructor. Notes: An "Application for Individual Study" must be completed and approved before registration in the course. The course is intended primarily for a student planning to pursue graduate studies in sociology.

**AUSOC 327 Crimes of the Powerful**

★3 (fi 6) (either term, 3-0-0). Why is it that so much attention is paid to "street crime" while the crimes of the powerful go virtually unpunished and sometimes unnoticed? A comprehensive examination of the prevalence and impact of crime committed by the powerful, including white collar occupational crime, corporate crimes, and crimes committed by the state. Prerequisite: One of AUCRI 160, 224, 225, 353, AIDS 160, AUPOL 353, AUSOC 224, 225. Note: Credit may be obtained for only one of AUSOC 327, 427, AUCRI 327, 427.

**AUSOC 339 Fieldwork Methodology**

★3 (fi 6) (either term, 3-0-0). Examination of fieldwork as it pertains to a qualitative sociology. Topics include epistemology, participant observation, unstructured interviews, managing and interpreting data, and research ethics. Each student completes an original field research project. Prerequisite: AUSOC 236.

**AUSOC 358 Environmental Sociology**

★3 (fi 6) (either term, 3-0-0). Theoretical and empirical examination of the connection between the natural environment and the social world. This involves inquiry into the sociological dimensions of some major contemporary environmental problems including air, water and soil pollution, decreased biodiversity, deforestation, climate change, and ozone depletion. Particular attention is paid to the social and political connections among issues of industrialization, development, globalization, inequality, gender, social change and environmental destruction. Prerequisites: Third year standing and one of AUSOC 101, 103 or 105. Note: Credit may be obtained for only one of AUSOC 358, 458 and AUENV 358, 458.

**AUSOC 367 Knowledge and Human Society**

★3 (fi 6) (either term, 3-0-0). Nature and assessment of knowledge (e.g., values and belief systems manifest in art, science, technology) in the context of social systems; the connection between competing systems of knowledge and social change. Prerequisite: One of AUSOC 101, 103, 105. ★3 at a senior level in Sociology.

**AUSOC 371 Film and Contemporary Culture**

★3 (fi 6) (either term, 3-1L-0). Critical examination of both film as sophisticated text and sociological theories of film and contemporary culture. Prerequisite: One of AUSOC 101, 103, 105; third year standing.

**AUSOC 377 Contemporary Theories of Gender**

★3 (fi 6) (either term, 3-0-0). Examination of gender from the perspective of contemporary theories (in particular, feminist theories). The liberal, socialist, radical, and post-structuralist feminist perspectives on gender are addressed. As well, the course looks at gender from ethnomethodological and hermeneutic perspectives. Prerequisite: One of AUSOC 232, 233, 275, any course listed in the Women's Studies program.

**AUSOC 391 Social Change from Development to Globalization**

★3 (fi 6) (either term, 3-0-0). Examination of some of the global processes of social change, including theoretical perspectives of development and globalization, such as modernization theory, World Systems theory and sustainable development. Prerequisite: ★3 at a senior level in Sociology or participation in the Community Service Exchange Program.

**AUSOC 393 Political Sociology**

★3 (fi 6) (either term, 3-0-0). Political process seen as social action. An examination of the sociological import of themes such as the forms of power (e.g., authority, force), political organization (e.g., democracy, totalitarianism, the nation state), and political processes (e.g., leadership, party formation, political recruitment). Prerequisites: One of AUSOC 101, 103, 105; and ★3 at a senior level in Sociology.

**AUSOC 401 Directed Reading I**

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of sociology as

defined by the student and a supervising instructor. Prerequisite: Consent of the instructor. Notes: An "Application for Individual Study" must be completed and approved before registration in the course. The course is intended primarily for a student planning to pursue graduate studies in sociology.

**AUSOC 402 Directed Reading II**

★3 (fi 6) (either term, 1-0-0). Intensive study of a specific area of sociology as defined by the student and a supervising instructor. Prerequisites: AUSOC 301 or 401, and consent of the instructor. Notes: An "Application for Individual Study" must be completed and approved before registration in the course. The course is intended primarily for a student planning to pursue graduate studies in sociology.

**AUSOC 403 Selected Topics in Sociology**

★3 (fi 6) (either term, 3-0-0). Study of selected topics at an advanced level that allows for a focus that is both specific and deep. Prerequisites: Two of AUSOC 101, 103, 105; and consent of the instructor.

**AUSOC 404 Selected Topics in Sociology**

★3 (fi 6) (either term, 3-0-0). Study of selected topics at an advanced level that allows for a focus that is both specific and deep. Prerequisites: Two of AUSOC 101, 103, 105; and consent of the instructor.

**AUSOC 405 Selected Topics in Sociology**

★3 (fi 6) (either term, 3-0-0). Study of selected topics at an advanced level that allows for a focus that is both specific and deep. Prerequisites: Two of AUSOC 101, 103, 105; and consent of the instructor.

**AUSOC 406 Selected Topics in Sociology**

★3 (fi 6) (either term, 3-0-0). Study of selected topics at an advanced level that allows for a focus that is both specific and deep. Prerequisites: Two of AUSOC 101, 103, 105; and consent of the instructor.

**AUSOC 407 Directed Research I**

★3 (fi 6) (either term, 1-0-0). Original research project as developed by the student and supervising instructor. Prerequisite: Consent of the instructor. Notes: An "Application for Individual Study" must be completed and approved before registration in the course. The course is intended primarily for a student planning to pursue graduate studies in sociology.

**AUSOC 408 Directed Research II**

★3 (fi 6) (either term, 1-0-0). Original research project as developed by the student and supervising instructor. Prerequisite: Consent of the instructor. Notes: An "Application for Individual Study" must be completed and approved before registration in the course. The course is intended primarily for a student planning to pursue graduate studies in sociology.

**AUSOC 427 Crimes of the Powerful**

★3 (fi 6) (either term, 3-0-0). Why is it that so much attention is paid to "street crime" while the crimes of the powerful go virtually unpunished and sometimes unnoticed? A comprehensive examination of the prevalence and impact of crime committed by the powerful, including white collar occupational crime, corporate crimes, and crimes committed by the state. Prerequisite: One of AUCRI 160, 224, 225, 353, AIDS 160, AUPOL 353, AUSOC 224, 225. Note: Credit may be obtained for only one of AUSOC 327, 427, AUCRI 327, 427.

**AUSOC 437 Symbolic Interactionism**

★3 (fi 6) (either term, 3-0-0). Review of the theoretic contributions that symbolic interactionism has made to sociological inquiry. Taking a review of the conceptual groundwork laid by the pragmatists as its point of departure, the course confronts the work of the theorists such as C. H. Cooley, W. I. Thomas, G. H. Mead, and H. Blumer. Classic debates within this tradition are examined relative to more contemporary responses. Prerequisite: ★6 at a senior level in Sociology.

**AUSOC 439 Seminar in Contemporary Sociological Theory**

★3 (fi 6) (either term, 3-0-0). Issues in contemporary theory. Central concepts and arguments proposed by a variety of theorists are examined. Topics covered vary by instructor. A student confronts primary texts. Prerequisite: ★6 at a senior level in Sociology.

## 231.58 Augustana Faculty - Spanish, AUSPA

Department of Humanities  
Augustana Faculty

### Undergraduate Courses

**AUSPA 100 Introductory Spanish**

★6 (fi 12) (two term, 2-0-0 12 weeks immersion). Introduction to the Spanish language designed to develop functional oral skills and a rudimentary reading and writing ability in Spanish through class instruction, seminars, and immersion experience, including living with Spanish speakers. Prerequisite: Consent of the Development Studies selection committee. Corequisites: One of AUGDS 122, 124, 222, 224, 322, 324; and one of AUGDS 123, 125, 223, 225, 323, 325. Notes:

The course is not open to a student with prior university credit in or native knowledge of Spanish. Credit may be obtained for only one of AUSPA 100, 101, 102, 103, 104.

#### **AUSPA 101 Beginners' Spanish I**

★3 (*fi 6*) (either term, 4-0-0). Introduction to the essentials of the Spanish language designed to develop ability in speaking and writing, with a strong emphasis on the development of oral communication skills. Note: Credit may be obtained for only one of AUSPA 100, 101 and 103.

#### **AUSPA 102 Beginners' Spanish II**

★3 (*fi 6*) (either term, 4-0-0). Continuation of AUSPA 101. Prerequisite: AUSPA 101. Note: Credit may be obtained for only one of AUSPA 100, 102 and 104.

#### **AUSPA 103 Introductory Spanish I**

★3 (*fi 6*) (either term, variable). Introduction to the Spanish language designed to develop functional oral skills and a rudimentary reading and writing ability in Spanish through class instruction, seminars, and immersion experience, including living with Spanish speakers. Corequisite: Participation in an Augustana Learning and Beyond offering in Spanish Latin America. Notes: Credit may be obtained for only one of AUSPA 100, 101 and 103.

#### **AUSPA 104 Introductory Spanish II**

★3 (*fi 6*) (either term, variable). Continuation of introduction to the Spanish language designed to develop functional oral skills and a rudimentary reading and writing ability in Spanish through class instruction, seminars, and immersion experience, including living with Spanish speakers. Prerequisite: AUSPA 101 or 103. Corequisite: Participation in an Augustana Learning and Beyond offering in Spanish Latin America. Notes: Credit may be obtained for only one of AUSPA 100, 102 and 104.

#### **AUSPA 200 Intermediate Spanish Communication**

★6 (*fi 12*) (two term, 3-0-0 12 wks Immersion). Stress on oral communication through immersion, including living with native Spanish speakers. A continuation of speaking, listening, reading, and writing skills and understanding. Hispanic culture that was begun at the first year level of Spanish. Completion of the verb system. Prerequisite: Spanish 30 (or equivalent), AUSPA 100, 102, or 104. Corequisite: Immersion experience. Notes: Currently offered through the Puebla-Alberta Community Service Exchange, or "Mi casa es tu casa" with the Universidad Autonoma del Estado de Morelos. Credit may be obtained for only one of AUSPA 200, 201, 202, 203, 204.

#### **AUSPA 201 Intermediate Spanish I**

★3 (*fi 6*) (either term, 4-0-0). Designed to consolidate basic Spanish language skills through systematic grammar review and practice in various language skills. Prerequisite: Spanish 30 (or equivalent), AUSPA 100, 102 or 104. Note: Credit may be obtained for only one of AUSPA 200, 201 and 203.

#### **AUSPA 202 Intermediate Spanish II**

★3 (*fi 6*) (either term, 4-0-0). Continuation of AUSPA 201. Prerequisite: AUSPA 201 or 203. Note: Credit may be obtained for only one of AUSPA 200, 202 and 204.

#### **AUSPA 203 Intermediate Spanish I**

★3 (*fi 6*) (either term, variable). Stress on oral communication through immersion, including living with native Spanish speakers. A continuation of speaking, listening, reading and writing skills and understanding Hispanic culture that was begun at the first year level of Spanish. Completion of the verb system and introduction to translation and interpretation. Prerequisite: AUSPA 100, 102 or 104. Corequisite: Participation in an Augustana Learning and Beyond offering in Spanish Latin America. Notes: Credit may be obtained for only one of AUSPA 200, 201, 203.

#### **AUSPA 204 Intermediate Spanish II**

★3 (*fi 6*) (either term, variable). A continuation of AUSPA 203. Stress on oral communication through immersion, including living with native Spanish speakers. A continuation of speaking, listening, reading, and writing skills and understanding Hispanic culture that was begun at the first year level of Spanish. Completion of the verb system and introduction to translation and interpretation. Prerequisite: AUSPA 201 or 203. Corequisite: Participation in an Augustana Learning and Beyond offering in Spanish Latin America. Notes: Credit may be obtained for only one of AUSPA 200, 202, and 204.

#### **AUSPA 230 Introduction to Modern and Contemporary Latin American Fiction**

★3 (*fi 6*) (either term, 3-0-0). Selected works in English translation from representative authors such as Borges, Fuentes, and Garcia Márquez. Note: Credit can be obtained from only one of AUSPA 230 and AULIT 201.

#### **AUSPA 231 Selected Topics in Modern and Contemporary Latin American Literature**

★3 (*fi 6*) (either term, 3-0-0). Study of selected twentieth-century literary works in English translation from particular Latin American countries and regions. The country or region on which the course focuses varies from year to year. Note: Credit can be obtained from only one of AUSPA 231, AULIT 202, 301 (2007).

#### **AUSPA 238 Selected Topics in Hispanic Literature**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, works, periods, and critical approaches. Focus and content of each course are determined by student and faculty interests, and vary from year to year.

#### **AUSPA 239 Selected Topics in Hispanic Literature**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, works, periods, and critical approaches. Focus and content of each course are determined by student and faculty interests, and vary from year to year.

#### **AUSPA 240 Development Studies Seminar (México)**

★6 (*fi 12*) (either term, 0-6s-0). Integrative study of development issues and strategies based on work experiences in rural communities in and African, Asian or Latin American country (currently México). Prerequisite: Consent of the selection committee. Notes: Credit may be obtained for only one of AUSPA 240, 340, AUGDS 122, 222, 322, AUIDS 122 (2009), 222 (2009), 322 (2009).

#### **AUSPA 241 Development Studies Practicum (México)**

★3 (*fi 6*) (either term, 0-0-6). By working in an African, Asian or Latin American country (currently México) in projects dealing with such issues as health care, water aid, sustainable farming, developing co-operatives, and education, the student becomes familiar with various aspects of and integrated approach to development. Prerequisite: Consent of the selection committee. Notes: Credit may be obtained for only one of AUSPA 241, 341, AUGDS 123, 223, 323, AUIDS 123 (2009), 223 (2009), 323 (2009).

#### **AUSPA 250 Integrated Studies (Cuba)**

★3 (*fi 6*) (second term, 3-0-0). This is a mandatory course for all students attending the Augustana-in-Cuba program. The course will integrate various disciplinary considerations with the student's experiences while living and studying for a semester in Cuba. Themes will include: Cuban society and culture, Cuba in a Latin American context, Cuba and the world. Notes: Credit may be obtained for only one of AUSPA 250 and AUIDS 292. The course is available only as part of the Augustana-in-Cuba Program. Costs of the program beyond and including regular tuition are the responsibility of the student.

#### **AUSPA 251 Cuban History since 1895**

★3 (*fi 6*) (second term, 3-0-0). Study of Cuban history from the War of Independence (1895-1898) to the present. Note: Credit may be obtained for only one of AUSPA 251 and AUHIS 291. The course is available only as part of the Augustana-in-Cuba Program.

#### **AUSPA 252 Cuban Government and Politics**

★3 (*fi 6*) (second term, 3-0-0). Survey of Cuban state institutions, political ideas, the Organs of Popular Power, the Communist Party of Cuba, and mass organizations. Notes: Credit may be obtained for only one of AUSPA 252 and AUPOL 239. The course is available only as part of the Augustana-in-Cuba Program.

#### **AUSPA 253 Women in Contemporary Cuba**

★3 (*fi 6*) (second term, 3-0-0). Sociological examination of the life of women in contemporary Cuba, focusing on the experience of women within families, workplaces and education. Notes: Credit may be obtained for only one of AUSPA 253 and AUSOC 279. The course is available only as part of the Augustana-in-Cuba Program.

#### **AUSPA 301 Advanced Spanish I**

★3 (*fi 6*) (either term, 4-0-0). Designed as the normal sequel to AUSPA 200 or 202, the course is intended to strengthen and consolidate speaking, reading, and writing skills acquired in the aforementioned courses. Prerequisite: AUSPA 200, 202 or 204. Notes: Credit may be obtained for only one of AUSPA 301 and 303.

#### **AUSPA 302 Advanced Spanish II**

★3 (*fi 6*) (either term, 8-0-0 in 6 weeks). Designed as the normal sequel to AUSPA 301, the course is intended to strengthen and consolidate speaking, reading, and writing skills acquired in the aforementioned course. Prerequisite: AUSPA 301 or 303. Notes: Credit may be obtained for only one of AUSPA 302 and 304.

#### **AUSPA 303 Advanced Spanish I**

★3 (*fi 6*) (either term, variable). Designed to develop further the comprehension, speaking, writing and reading skills acquired in Intermediate Spanish through classroom instruction, excursions and immersion experience, including living with native Spanish speakers. Improvement in overall fluency, enhanced knowledge of Hispanic culture and review of key grammatical concepts are integral to the course. Prerequisite: AUSPA 200, 202 or 204. Corequisite: Participation in an Augustana Learning and Beyond offering in Spanish Latin America. Notes: Credit may be obtained for only one of AUSPA 301 and 303.

#### **AUSPA 304 Advanced Spanish II**

★3 (*fi 6*) (either term, variable). Continuation of AUSPA 303. Designed to develop further the comprehension, speaking, writing and reading skills acquired in Intermediate Spanish through classroom instruction, excursions and immersion experience, including living with native Spanish speakers. Improvement in overall fluency, enhanced knowledge of Hispanic culture and review of key grammatical concepts are integral to the course. Prerequisite: AUSPA 301 or 303. Corequisite: Participation in an Augustana Learning and Beyond offering in Spanish Latin America. Notes: Credit may be obtained for only one of AUSPA 302 and 304.

#### **AUSPA 338 Selected Topics in Spanish Literature**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, works, periods, and critical approaches. Focus and content of each course are determined by student and faculty interests, and vary from year to year.

**AUSPA 339 Selected Topics in Spanish Literature**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of selected authors, works, periods, and critical approaches. Focus and content of each course are determined by student and faculty interests, and vary from year to year.

**AUSPA 340 Development Studies Seminar (México)**

★6 (*fi 12*) (either term, 0-6s-0). Integrative study of development issues and strategies based on work experiences in rural communities in and African, Asian or Latin American country (currently México). Prerequisite: Consent of the selection committee. Notes: Credit may be obtained for only one of AUSPA 240, 340, AUGDS 122, 222, 322, AUIDS 122 (2009), 222 (2009), 322 (2009).

**AUSPA 341 Development Studies Practicum (México)**

★3 (*fi 6*) (either term, 0-0-6). By working in an African, Asian or Latin American country (currently México) in projects dealing with such issues as health care, water aid, sustainable farming, developing co-operatives, and education, the student becomes familiar with various aspects of and integrated approach to development. Prerequisite: Consent of the selection committee. Notes: Credit may be obtained for only one of AUSPA 241, 341, AUGDS 123, 223, 323, AUIDS 123 (2009), 223 (2009), 323 (2009).

**AUSPA 402 Directed Study: Language**

★3 (*fi 6*) (either term, 1-0-0). Intensive study of a specific area of Spanish as defined by the student and supervising instructor. Prerequisites: ★15 at a senior level in Spanish, including at least ★3 at the 300 level, and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

**AUSPA 403 Directed Study: Literature**

★3 (*fi 6*) (either term, 1-0-0). Intensive study of a specific area of Spanish as defined by the student and supervising instructor. Prerequisites: ★15 at a senior level in Spanish, including at least ★3 at the 300 level, and consent of the instructor. Note: An "Application for Individual Study" must be completed and approved before registration in the course.

**AUSPA 404 Advanced Spanish III**

★3 (*fi 6*) (either term, variable). Designed to develop further the comprehension, speaking, writing and reading skills acquired in Advanced Spanish through classroom instruction, excursions and immersion experience, including living with native Spanish speakers. Improvement in overall fluency, enhanced knowledge of Hispanic culture and review of key grammatical concepts are integral to the course. Prerequisite: AUSPA 302 or AUSPA 304. Corequisite: Participation in an Augustana Learning and Beyond offering in Spanish Latin America.

**AUSPA 405 Advanced Spanish IV**

★3 (*fi 6*) (either term, variable). Designed to develop further the comprehension, speaking, writing and reading skills acquired in Advanced Spanish through classroom instruction, excursions and immersion experience, including living with native Spanish speakers. Improvement in overall fluency, enhanced knowledge of Hispanic culture and review of key grammatical concepts are integral to the course. Prerequisite: AUSPA 402 or AUSPA 404. Corequisite: Participation in an Augustana Learning and Beyond offering in Spanish Latin America.

**231.59 Augustana Faculty - Statistics, AUSTA**

Department of Science  
Augustana Faculty

**Undergraduate Courses****AUSTA 153 Introductory Applied Statistics for Business and Economics**

★3 (*fi 6*) (either term, 3-0-3). Introduction to elementary statistical concepts designed to provide an understanding of how statistics can be used to analyze real world phenomena. Emphasis is on applications in the field of business and economics. The student is required to use spreadsheet and other statistical software to analyze and examine statistical data. Prerequisite: Pure Mathematics 30 or Mathematics 30-1. Notes: Credit may be obtained for only one of AUSTA 153, 213, 215, AUPSY 213.

**AUSTA 213 Statistical Methods**

★3 (*fi 6*) (either term, 3-0-3). Frequency distributions, averages, dispersion, simple linear regression and correlation, elementary probability, binomial and normal distributions, sampling distributions, confidence intervals, significance tests on means and variances, chi square tests for two way tables, introduction to the analysis of variance. Labs include projects in which a student collects and analyzes real data. Prerequisite: Pure Mathematics 30 or Mathematics 30-1. Notes: The course does not count toward the major in Mathematics and Physics or the minor in Mathematics. Prerequisite: Pure Mathematics 30. Notes: The course does not count toward the major in Mathematics and Physics or the minor in Mathematics. Credit may be obtained for only one of AUSTA 213, 153, 215, AUPSY 213.

**AUSTA 215 Statistical Methods for the Natural Sciences**

★3 (*fi 6*) (either term, 3-0-0). Experimental design, data presentation and analysis;

descriptive statistics, probability distributions and statistical hypothesis testing; parametric and non-parametric tests, correlation and regression; use of statistical software. Prerequisites: Pure Mathematics 30 or Mathematics 30-1; one of AUBIO 110, 130, AUCHE 110, AUCSC 110, AUENV 120, AUGEO 120, AUMAT 110, 111, 120, AUPHY 102, 104, 110. Notes: The course does not count toward the major in Mathematics and Physics or the minor in Mathematics. Credit may be obtained for only one of AUSTA 153, 213, 215, AUPSY 213.

**231.60 Augustana Faculty - World Literatures, AULIT**

Department of Humanities  
Augustana Faculty

**Undergraduate Courses****AULIT 201 Introduction to Modern and Contemporary Latin American Fiction**

★3 (*fi 6*) (either term, 3-0-0). Selected works in English translation from representative authors such as Borges, Fuentes, and García Márquez. Note: Credit may be obtained for only one of AULIT 201 and AUSPA 230.

**AULIT 202 Topics in Modern and Contemporary Latin American Literature**

★3 (*fi 6*) (either term, 3-0-0). Study of selected twentieth-century literary works, in English translation, from particular Latin American countries and regions. The country or region on which the course focuses varies from year to year. Note: Credit may be obtained for only one of AULIT 202, 301 (2007) and AUSPA 231.

**231.61 Biochemistry, BIOCH**

Department of Biochemistry  
Faculty of Medicine and Dentistry

**Undergraduate Courses****Notes**

- (1) BIOCH 200, 310, 320, 330, 401, 410, 420, 430, 441, 450, 455, 460 can be used by students in the Faculty of Science as science courses.
- (2) Courses in clinical biochemistry are listed under Medical Laboratory Science.

**BIOCH 200 Introductory Biochemistry**

★3 (*fi 6*) (either term, 3-0-0). An introduction to the fundamental principles of biochemistry. Protein structure and function; lipids and the structure of biological membranes; nucleotides and the structure of nucleic acids; bioenergetics and the metabolism of carbohydrates, lipids, and nitrogen; the integration and regulation of cellular metabolism. Prerequisites: CHEM 101 and CHEM 261 or 164, or SCI 100. Notes: (1) This course is designed for students who require a one-term introduction to the fundamental principles of biochemistry and for students who intend to take further courses in biochemistry. (2) BIOCH 200 may not be taken for credit if credit has already been obtained in any of BIOCH 203, 205, or 220.

**BIOCH 310 Bioenergetics and Metabolism**

★3 (*fi 6*) (either term, 3-0-0). This course is designed to enable rigorous study of the molecular mechanisms in bioenergetics and metabolism. It covers: the principles of bioenergetics; the reactions and pathways of carbohydrate, lipid, and nitrogen metabolism, and their regulation; oxidative phosphorylation; the integration and hormonal regulation of mammalian metabolism. Prerequisites: BIOCH 200, CHEM 102 (or SCI 100) and CHEM 263 with a minimum GPA of 2.70 for these three courses. This course may not be taken for credit if credit has already been obtained in BIOCH 203 or 205. In the case of over-subscription, preference will be given to students enrolled in programs with a requirement for this course.

**BIOCH 320 Structure and Catalysis**

★3 (*fi 6*) (either term, 3-0-0). This course is designed to illustrate, in detail, the relationships between structure and function in biological molecules. It covers: the structure of proteins; experimental techniques used to study proteins; selected illustrations of protein function; enzyme catalysis, kinetics, and regulation; structural carbohydrates and glycobiology; the structure of lipids; biological membranes and mechanisms of transport. Prerequisites: BIOCH 200, CHEM 102 (or SCI 100) and CHEM 263 with a minimum GPA of 2.70 for these three courses. This course may not be taken for credit if credit has already been obtained in BIOCH 203. In the case of over-subscription, preference will be given to students enrolled in programs with a requirement for this course.

**BIOCH 330 Nucleic Acids and Molecular Biology**

★3 (*fi 6*) (either term, 3-0-0). This course is designed to provide students with a comprehensive introduction to the biochemistry of nucleic acids. It covers: the structure and properties of nucleotides and nucleic acids; DNA-based information technologies; genes and chromosome structure; molecular mechanisms in DNA replication, repair, and recombination; RNA metabolism; protein synthesis and



targeting; the regulation of gene expression. Prerequisites: BIOCH 200, CHEM 102 (or SCI 100), and CHEM 263, with a minimum GPA of 2.70 for these three courses. This course may not be taken for credit if credit has already been obtained in BIOCH 205.

#### **BIOCH 398 Research Project**

★3 (*fi 6*) (either term, 0-0-8). Supervised research within a laboratory in the Department of Biochemistry. The results of the research project will be presented in a poster. This course is available only as a six week Spring or Summer session course. Prerequisites: Credit in at least one 300-level BIOCH course and consent of the Department. BIOCH 398 may not be taken for credit if credit has been obtained in BIOCH 498 or 499.

#### **L BIOCH 401 Biochemistry Laboratory**

★6 (*fi 12*) (two term, 0-0-8). Laboratory course in modern biochemical techniques. Designed for Biochemistry Honors and Specialization students in their third or fourth year. Other interested students may enrol subject to space limitations. Prerequisites: BIOCH 320 and 330, or BIOCH 203 and 205, all with a minimum grade of B-, and consent of Department.

#### **L BIOCH 410 Signal Transduction**

★3 (*fi 6*) (second term, 3-0-0). Principles of the biochemistry of cell communication and signal transduction through receptor activation, the generation of second messengers, and the control of protein modifications. The course will emphasize the mechanisms responsible for the regulation of cell migration, division and death. Prerequisites: BIOCH 310, 320 and 330, or BIOCH 203 and 205, all with a minimum grade of B-, or consent of the Department. Intended for undergraduate students. Graduate students may not register for credit (see BIOCH 510).

#### **L BIOCH 420 Protein Chemistry, Structure, and Function**

★3 (*fi 6*) (second term, 3-0-0). Protein chemistry and purification. The intra- and intermolecular forces that determine protein structure. Principles of protein folding and dynamics. Enzyme mechanisms and ligand binding interactions. Prerequisites: BIOCH 320, or BIOCH 203 and 205, all with a minimum grade of B- or consent of Department. Intended for undergraduate students. Graduate students may not register for credit (see BIOCH 520).

#### **BIOCH 425 Proteomics**

★3 (*fi 6*) (second term, 3-0-1/2). An advanced course focusing on the analysis of protein function and protein-protein interactions within the context of the entire protein complement of a cell. Some aspects of protein structure as it pertains to the principles of protein-protein interactions will be covered along with genetic and biochemical methods for the analysis of protein complexes, protein interaction networks and system wide protein identification and dynamics. This course is intended for students in Honors or Specialization in Biochemistry. Students in other programs may be admitted subject to availability and with the consent of the Department. Prerequisites: BIOCH 320 and BIOCH 330 with a minimum GPA of 3.0 in these courses.

#### **L BIOCH 430 Biochemistry of Eukaryotic Gene Expression**

★3 (*fi 6*) (first term, 3-0-0). The organization and expression at the molecular level of information encoded in the nucleic acids of eukaryotic cells. The focus will be on genome structure and the regulation of gene expression at the levels of transcription, post-transcriptional processing, translation, post-translational modification and protein sorting. Recombinant DNA technologies and genetic engineering will be discussed as methods for studying the cellular processing of genetic information. Prerequisites: BIOCH 320 and 330, or BIOCH 203 and 205, all with a minimum grade of B- or consent of Department. Intended for undergraduate students. Graduate students may not register for credit (see BIOCH 530).

#### **L BIOCH 441 Structure and Function of Biological Membranes**

★3 (*fi 6*) (first term, 3-0-0). Survey of the structure and function of biological membranes. Topics include the structure, properties and composition of biomembranes, characterization and structural principles of membrane lipids and proteins, lateral and transverse asymmetry, dynamics, lipid-protein interactions, membrane enzymology, permeability, and biogenesis. Prerequisites: BIOCH 320, or BIOCH 203 and 205, all with a minimum grade of B- or consent of Department. Intended for undergraduate students. Graduate students may not register for credit (see BIOCH 541).

#### **L BIOCH 450 The Molecular Biology of Mammalian Viruses**

★3 (*fi 6*) (first term, 3-0-0). This course will focus on virus structure, replication, and interaction with host cells at the molecular level. Lytic viruses with single- or double-stranded DNA or RNA genomes will be discussed, as will the mechanisms of viral oncogenesis. Prerequisites: BIOCH 320 and 330, or BIOCH 203 and 205, all with a minimum grade of B- or consent of Department. Intended for undergraduate students. Graduate students may not register for credit (see BIOCH 550).

#### **L BIOCH 455 Biochemistry of Lipids and Lipoproteins**

★3 (*fi 6*) (second term, 3-0-0). Advanced course focusing on specific aspects of the regulation of lipid and lipoprotein metabolism. Topics include the transcriptional and post-translational mechanisms governing the synthesis and degradation of important enzymes, lipids, and lipid transport molecules; the role of lipid mediators in signaling pathways and protein modification; the assembly and dynamics of lipoproteins and biological membranes; genetic disruptions of lipid regulatory

proteins such as cell surface receptors leading to human disease. Prerequisites: BIOCH 310 with a minimum grade of B- or consent of Department. Intended for undergraduate students. Graduate students may not register for credit (see BIOCH 555).

#### **BIOCH 465 Methods in Molecular Biophysics**

★3 (*fi 6*) (either term, 3-0-0). Survey of biophysical methods used in the characterization and structural determination of biological macromolecules, from ensemble measurements to single-molecule detection. Topics include mass spectrometry, optical spectroscopy, light microscopy, X-ray and neutron diffraction, electron microscopy, molecular dynamics and nuclear magnetic resonance. Emphasis is on using techniques in evaluating structure-function relationships through the discussion of representative macromolecular systems. Prerequisites: BIOCH 320 with a minimum grade of B- or consent of the Department. This course cannot be taken for credit if credit has already been obtained in BIOCH 460.

#### **L BIOCH 481 Design and Construction of Synthetic Biological Systems I**

★3 (*fi 6*) (first term, 3-0-0). This course explores both the opportunities and challenges of synthetic life by providing a practical and theoretical introduction to this new discipline through lectures, class discussion, assigned reading and case studies. Topics covered include: natural vs artificial design of genetic circuits and devices, experimental aspects of gene and gene network construction, metabolic network design and evaluation, and the role of computer modeling in design creation, testing and optimization. The availability of BIOCH 481 to students from non-biochemistry backgrounds emphasizes the highly interdisciplinary nature of the field. Prerequisites: Registration in the Faculties of Science or Engineering and a minimum GPA 3.3 (or consent of the department).

#### **L BIOCH 482 Design and Construction of Synthetic Biological Systems II**

★3 (*fi 6*) (second term, 0-0-4). Designed to prepare students for participation in the iGEM Competition (International Genetically Engineered Machines) through team-based problem solving. Teams composed of individuals from different programs are expected to: 1) Identify a relevant problem within the realm of synthetic biology. 2) Devise a credible and detailed plan to solve an aspect of the problem. 3) Demonstrate the feasibility of the design by computer modeling. 4) Evaluate the costs of success in terms of the financial, human and technological resources that are needed for the timely completion of the project. 5) Develop a plan to acquire the resources that are required for a successful outcome. 6) Produce a report and presentation. Although students are expected to exhibit a high level of independence and creativity, they can count on considerable guidance and support from participating faculty. Prerequisites: BIOCH 481 (or consent of the department).

#### **BIOCH 495 Special Topics in Biochemistry**

★3 (*fi 6*) (either term, 0-3s-0). Covers specialized topics of current interest to advanced undergraduates in Biochemistry programs. Consult the Department for details about current offerings. Prerequisite: consent of the instructor. Credit for this course may be obtained more than once.

#### **L BIOCH 498 Directed Research Project**

★3 (*fi 6*) (either term, 0-0-8). Supervised research within a laboratory in the Department of Biochemistry, to be carried out over one term (Fall or Winter). The results of the research project will be presented in a final written report and an oral presentation. Can be taken as a science elective but not as a substitute for required courses in Biochemistry. Can be taken for credit in addition to BIOCH 499. Prerequisites: BIOCH 401 or consent of the Department.

#### **L BIOCH 499 Directed Research Project**

★6 (*fi 12*) (two term, 0-0-8). Supervised research within a laboratory in the Department of Biochemistry, to be carried out over both terms of Fall/Winter. The results of the research project will be presented in a final written report and an oral presentation. This course is required for the Honors program, but can be taken as a science elective by students in the Specialization program. Prerequisites: BIOCH 401 and consent of the Department.

## Graduate Courses

#### **BIOCH 510 Signal Transduction**

★3 (*fi 6*) (second term, 3-0-0). Principles of the biochemistry of cell communication and signal transduction through receptor activation, the generation of second messengers, and the control of protein modifications. The course will emphasize the mechanisms responsible for the regulation of cell migration, division and death. Prerequisites: BIOCH 310, 320 and 330, or BIOCH 203 and 205, all with a minimum grade of B-, or consent of the Department. Lectures are the same as for BIOCH 410, but with additional assignments and evaluation appropriate to graduate studies. This course may not be taken for credit if credit has already been obtained in BIOCH 410.

#### **BIOCH 520 Protein Chemistry, Structure, and Function**

★3 (*fi 6*) (second term, 3-0-0). Protein chemistry and purification. The intra- and intermolecular forces that determine protein structure. Principles of protein folding and dynamics. Enzyme mechanisms and ligand binding interactions. Prerequisites:

BIOCH 320, or BIOCH 203 and 205, all with a minimum grade of B- or consent of Department. Lectures are the same as for BIOCH 420, but with additional assignments and evaluation appropriate to graduate studies. This course may not be taken for credit if credit has already been obtained in BIOCH 420.

#### **BIOCH 530 Biochemistry of Eukaryotic Gene Expression**

★3 (fi 6) (first term, 3-0-0). The organization and expression at the molecular level of information encoded in the nucleic acids of eukaryotic cells. The focus will be on genome structure and the regulation of gene expression at the levels of transcription, post-transcriptional processing, translation, post-translational modification and protein sorting. Recombinant DNA technologies and genetic engineering will be discussed as methods for studying the cellular processing of genetic information. Prerequisites: BIOCH 320 and 330, or BIOCH 203 and 205, all with a minimum grade of B- or consent of Department. Lectures are the same as for BIOCH 430, but with additional assignments and evaluation appropriate to graduate studies. This course may not be taken for credit if credit has already been obtained in BIOCH 430.

#### **BIOCH 541 Structure and Function of Biological Membranes**

★3 (fi 6) (first term, 3-0-0). Survey of the structure and function of biological membranes. Topics include the structure, properties and composition of biomembranes, characterization and structural principles of membrane lipids and proteins, lateral and transverse asymmetry, dynamics, lipid-protein interactions, membrane enzymology, permeability, and biogenesis. Prerequisites: BIOCH 320, or BIOCH 203 and 205, all with a minimum grade of B- or consent of Department. Lectures are the same as for BIOCH 441, but with additional assignments and evaluation appropriate to graduate studies. This course may not be taken for credit if credit has already been obtained in BIOCH 441.

#### **BIOCH 550 The Molecular Biology of Mammalian Viruses**

★3 (fi 6) (first term, 3-0-0). This course will focus on virus structure, replication, and interaction with host cells at the molecular level. Lytic viruses with single- or double-stranded DNA or RNA genomes will be discussed, as will the mechanisms of viral oncogenesis. Prerequisites: BIOCH 320 and 330, or BIOCH 203 and 205, all with a minimum grade of B- or consent of Department. Lectures are the same as for BIOCH 450, but with additional assignments and evaluation appropriate to graduate studies. This course may not be taken for credit if credit has already been obtained in BIOCH 450.

#### **BIOCH 555 Biochemistry of Lipids and Lipoproteins**

★3 (fi 6) (second term, 3-0-0). Advanced course focusing on specific aspects of the regulation of lipid and lipoprotein metabolism. Topics include the transcriptional and post-translational mechanisms governing the synthesis and degradation of important enzymes, lipids, and lipid transport molecules; the role of lipid mediators in signaling pathways and protein modification; the assembly and dynamics of lipoproteins and biological membranes; genetic disruptions of lipid regulatory proteins such as cell surface receptors leading to human disease. Prerequisites: BIOCH 310 with a minimum grade of B- or consent of Department. Lectures are the same as for BIOCH 455, but with additional assignments and evaluation appropriate to graduate studies. This course may not be taken for credit if credit has already been obtained in BIOCH 455.

#### **BIOCH 565 Methods in Molecular Biophysics**

★3 (fi 6) (either term, 3-0-0). Survey of biophysical methods used in the characterization and structural determination of biological macromolecules, from ensemble measurements to single-molecule detection. Topics include mass spectrometry, optical spectroscopy, light microscopy, X-ray and neutron diffraction, electron microscopy, molecular dynamics and nuclear magnetic resonance. Emphasis is on using techniques in evaluating structure-function relationships through the discussion of representative macromolecular systems. Lectures are the same as for BIOCH 465, but with additional assignments and evaluation appropriate to graduate studies. This course cannot be taken for credit if credit has already been obtained in BIOCH 460 or 465.

#### **BIOCH 609 Macromolecular Structure Analysis**

★3 (fi 6) (second term, 3-0-0). Principles of X-ray crystallography as applied to the study of protein and nucleic acid structure. Practical aspects of diffraction and structure solution are demonstrated by a collaborative study of a suitable small molecule of biological interest. Designed for senior honors and graduate students. Prerequisite: consent of Instructor. Maximum enrolment of 10 students. Offered in alternate years.

#### **BIOCH 620 Selected Topics in Protein Structure, Function, and Regulation**

★3 (fi 6) (second term, 0-3s-0). Directed reading and seminar course, based on papers taken from recent literature of protein research. Students critically discuss the papers and give oral presentations to the class. Designed for graduate students. Prerequisite: BIOCH 420 or equivalent, or consent of Department.

#### **BIOCH 623 Special Topics in Research on Polynucleotides**

★2 (fi 4) (two term, 0-1s-0). This course is a journal club and discussion group in which current research topics on nucleic acids are discussed. Specific talks range from biochemistry, genetics and microbiology to nuclear biology and clinical aspects.

#### **BIOCH 626 Special Topics in Protein Research**

★2 (fi 4) (two term, 0-1s-0). Seminar course for advanced students. Detailed consideration is given to recent advances in research on protein structure and function and mechanism of enzyme action. Prerequisite: BIOCH 420 or consent of Department.

#### **BIOCH 630 Selected Topics in Modern Molecular Biology**

★3 (fi 6) (second term, 0-3s-0). Directed reading and seminar course, based on papers taken from the recent literature of molecular biology. Students critically discuss the papers and give oral presentations. Note: designed for graduate students; offered yearly. Prerequisite: BIOCH 530 and consent of the Department.

#### **BIOCH 640 Special Topics in Research on Biomembranes**

★2 (fi 4) (two term, 0-1s-0). Seminar course for advanced students covering selected topics from the current literature in the field of membrane structure and function. Prerequisite: BIOCH 441 or consent of Department.

#### **BIOCH 641 Selected Topics on the Structure and Function of Biological Membranes**

★3 (fi 6) (first term, 0-3s-0). Directed reading and seminar course on the structure and function of biological membranes. Topics include membrane biogenesis, bioenergetics, transport and structural aspects of membrane lipids and proteins. Prerequisite: BIOCH 441 or consent of the Department.

#### **BIOCH 650 Signal Transduction**

★2 (fi 4) (two term, 0-1s-0). A journal club and discussion group addressing topics in the general area of signalling mechanisms that control cell activation, growth, apoptosis and vesicle trafficking. Specific talks range from biochemistry, genetics and microbiology to molecular biology and clinical aspects. Prerequisite: BIOCH 410/510 or consent of Department.

#### **BIOCH 651 Special Topics in Lipid and Lipoprotein Research**

★2 (fi 4) (two term, 0-1s-0). Seminar for advanced students covering selected topics from the current literature in the field of lipid and lipoprotein research. Prerequisite: BIOCH 555 or consent of Department.

#### **BIOCH 655 Advances in Lipid and Lipoprotein Research**

★3 (fi 6) (first term, 1-2s-0). Recent developments and use of the current literature are emphasized. Topics include regulation of lipid metabolism, intracellular lipid trafficking, regulation of lipoprotein secretion, lipid transfer among lipoproteins, reverse cholesterol transport, and atherosclerosis. Prerequisite: BIOCH 455, or 555, or consent of Department. Offered in alternate years.

#### **BIOCH 670 Recent Advances in Biochemistry**

★4 (fi 8) (two term, 0-1s-0). A seminar course on topics of current interest in biochemistry. Students will contribute to a presentation based on recent developments published in first rate journals. Attendance at all seminars is expected. Note: open only to graduate students in Biochemistry.

#### **BIOCH 671 Recent Advances in Biochemistry**

★4 (fi 8) (two term, 0-1s-0). A seminar course on topics of current interest in biochemistry. Students will contribute a presentation on their research project that includes original data. Attendance at all seminars is expected. Prerequisite: BIOCH 670 or consent of the Department. Note: open only to graduate students in Biochemistry.

#### **BIOCH 675 Magnetic Resonance in Biology and Medicine II**

★3 (fi 6) (second term, 3-0-0). Designed for advanced honors and graduate students interested in the application of nuclear magnetic resonance spectroscopy to biological systems. Topics include quantum mechanical basis of NMR, multinuclear multidimensional NMR experiments, NMR relaxation theory, new NMR applications. Prerequisite: consent of Instructor. Offered in alternate years.

## 231.62 Biochimie, BIOCM

Faculté Saint-Jean

### Cours de 1er cycle

#### **BIOCM 200 Introduction à la biochimie I**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction aux principes de base de la biochimie. Structures et fonctions des protéines; lipides et structure des membranes biologiques; nucléotides et structures des acides nucléiques; bioénergétique et métabolisme des glucides, des lipides et de l'azote; intégration et régulation du métabolisme cellulaire. Préalable(s): CHIM 101; CHIM 161 ou 261. Notes: (1) Ce cours s'adresse aux étudiants qui doivent suivre ★3 sur les principes de base de la biochimie, et aux étudiants qui comptent suivre des cours de biochimie plus avancés. (2) Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour BIOCM 203 ou 205 ou BIOCH 220.

## 231.63 Bioinformatics, BIOIN

Department of Biological Sciences  
Faculty of Science

## Undergraduate Courses

### BIOIN 301 Bioinformatics I

★3 (fi 6) (first term, 3-0-0). Introduction to computational tools and databases used in the collection and analysis of sequence data and other analytical data from high-throughput molecular biology studies. Students will use existing tools, and learn the underlying algorithms and their limitations. Prerequisite: any 200-level Biological Sciences course or consent of instructor. Credit cannot be obtained for both BIOIN 301 and BIOL 501.

### BIOIN 401 Bioinformatics II

★3 (fi 6) (second term, 3-0-3). Advanced topics in bioinformatics will be covered. A major part of the course will be devoted to team-based projects involving writing novel bioinformatics tools to deal with current problems in bioinformatics. Prerequisites: BIOIN 301, a 300-level COMPUT course and a 300-level GENET course. (Offered jointly by the Departments of Computing Science and Biological Sciences). [Biological Sciences].

## 231.64 Biologie, BIOLE

Faculté Saint-Jean

### Cours de 1er cycle

#### BIOLE 107 Introduction à la biologie cellulaire

★3 (fi 6) (l'un ou l'autre semestre, 3-1s-3). Introduction à la structure et au fonctionnement de la cellule. Les principaux sujets étudiés comprennent les cellules procaryotes et eucaryotes, la bioénergétique, comment les cellules se reproduisent et comment l'information génétique est emmagasinée et utilisée à travers les processus de réplication de l'ADN, de transcription et de traduction. Préalable(s): Biologie 30 et Chimie 30. Note: BIOLE 107 n'est pas un préalable pour BIOLE 108.

#### BIOLE 108 Introduction à la diversité biologique

★3 (fi 6) (l'un ou l'autre semestre, 3-1s-3). Examine les grandes lignées de la vie sur la Terre. Un survol des principes de l'évolution et de la classification, l'histoire de la vie et les adaptations clés des procaryotes, protistes, eumycètes, végétaux et animaux. Les laboratoires examinent la diversité de formes et de fonctions biologiques, et introduisent l'étudiant à la collecte de données et à la rédaction scientifique. Préalable: Biologie 30. Note: BIOLE 107 n'est pas un préalable pour BIOLE 108.

#### BIOLE 201 Biologie cellulaire des eucaryotes

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Une dissection structurale et fonctionnelle de la cellule eucaryote. Détection de molécules spécifiques au niveau ultrastructural; structure et fonction de la membrane plasmique; rôle du cytosquelette dans le transport intracellulaire, la mitose et la cytokinèse; le système endomembranaire, le ciblage des protéines, l'exocytose et l'endocytose; structure et fonction du noyau; contrôle du cycle cellulaire et cancer. Préalable(s): BIOLE 107. Préalable(s) ou concomitant(s): CHIM 161 ou 261. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour CELL 201.

#### BIOLE 207 La génétique moléculaire et l'hérédité

★3 (fi 6) (l'un ou l'autre semestre, 3-1s-3). Les principes chromosomiques et moléculaires de la transmission et du fonctionnement des gènes; la construction de cartes génétiques et physiques des gènes et des génomes; les protocoles utilisés pour isoler des gènes spécifiques. Seront aussi à l'étude les exemples de mécanismes régulateurs pour l'expression de matériel génétique chez les procaryotes et les eucaryotes. Préalable: BIOLE 107.

#### BIOLE 208 Les principes de l'écologie

★3 (fi 6) (l'un ou l'autre semestre, 3-0-3). L'écologie est l'étude scientifique des interactions entre les organismes et leur environnement selon une hiérarchie de niveaux d'organisation: les individus, les populations, les communautés et les écosystèmes. Destiné à donner à l'étudiant une vue générale des concepts de base en écologie, ce cours peut aussi servir de préparation à des cours plus avancés. Dans les laboratoires, l'accent sera sur le recueil, l'analyse et l'interprétation des données provenant d'expériences écologiques afin d'illustrer et compléter les notes du cours. Les exemples seront tirés d'une vaste étendue d'organismes et de systèmes. Préalable: BIOLE 108.

#### BIOLE 315 La biologie: une perspective historique

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Un survol des fondements scientifiques des découvertes biologiques jusqu'au milieu du 20<sup>ème</sup> siècle. Les étudiants doivent avoir une compréhension sophistiquée des concepts modernes de la biologie, écrire deux dissertations sur des sujets précis et participer activement dans les discussions en classe. Préalable: Un cours de niveau 300 en science biologique ou l'approbation du Vice-doyen aux affaires académiques.

#### BIOLE 321 Mécanismes de l'évolution

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Les principales caractéristiques du processus évolutif, incluant les données fossiles, les fondements de la génétique des populations, la sélection naturelle, l'adaptation et la spéciation. Préalable(s): BIOLE 108 et 207.

#### BIOLE 380 Analyse génétique des populations

★3 (fi 6) (l'un ou l'autre semestre, 3-1s-0). Application de la biologie moléculaire à l'étude de la systématique, de la structure des populations naturelles, des systèmes d'accouplement et de la criminalistique. Les sujets discutés incluent les techniques de détection de la variation génétique des populations naturelles, l'analyse phylogénétique de données moléculaires, les modèles mathématiques de la structure des populations, l'analyse de paternité et les empreintes génétiques. Préalable: BIOLE 207.

#### BIOLE 381 Les humains, la pollution et l'environnement

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Impact des polluants anthropogéniques sur les écosystèmes. Au départ, ce cours étudie la croissance de la population humaine et l'extraction de ressources non durables, ensuite il examine le transport des polluants dans l'atmosphère et la biosphère, la détection des polluants et leur impact écologique. Des données sur certains polluants (incluant bioxyde de carbone, ressources alimentaires, émissions d'acides, pesticides, bouleversements endocriniens, mercure et autres métaux, déversements d'huile, radiation) seront utilisées pour discuter l'importance pour les humains des écosystèmes, politiques et réglementations environnementales en Alberta et ailleurs au Canada. Préalable: BIOLE 208.

#### BIOLE 490 Étude dirigée

★3 (fi 6) (l'un ou l'autre semestre, 0-0-6). L'inscription dépendra d'une entente préalable entre l'étudiant et un professeur qui serait prêt à superviser le projet. Des crédits peuvent être obtenus plus d'une fois pour ce cours. Préalable(s): ★3 de niveau 300 en sciences biologiques et l'approbation du Vice-doyen aux affaires académiques.

#### BIOLE 498 Projet de recherche

★3 (fi 6) (l'un ou l'autre semestre, 0-0-6). Recherche dirigée dans le laboratoire d'un membre du personnel académique en biologie. Des crédits peuvent être obtenus plus d'une fois pour ce cours. Préalable: ★3 de niveau 300 en sciences biologiques et l'approbation du superviseur de recherche et du Vice-doyen aux affaires académiques.

#### BIOLE 499 Projet de recherche

★6 (fi 12) (aux deux semestres, 0-0-6). Recherche dirigée dans le laboratoire d'un membre du personnel académique en biologie. La complétion de ce projet requiert une présentation orale et un rapport écrit sur le projet de recherche. Préalable: ★3 de niveau 300 en sciences biologiques et l'approbation du superviseur de recherche et du Vice-doyen aux affaires académiques.

## 231.65 Biology (Biological Sciences), BIOL

Department of Biological Sciences  
Faculty of Science

### Notes

- See the following sections for listings of other Biological Sciences courses: Bioinformatics (BIOIN); Botany (BOT); Entomology (ENT); Genetics (GENET); Microbiology (MICRB); Zoology (ZOO).L.
- See the following sections for listings of other relevant courses: Interdisciplinary Studies (INT D); Immunology and Infection (IMIN); Marine Science (MA SC); Paleontology (PALEO).

## Undergraduate Courses

### **O** BIOL 107 Introduction to Cell Biology

★3 (fi 6) (either term, 3-1s-3). An introduction to cell structure and function. Major topics include the molecules and structures that comprise prokaryotic and eukaryotic cells, the mechanisms by which energy is harvested and used by cells, how cells reproduce, and how information is stored and used within a cell via the processes of DNA replication, transcription, and translation. Prerequisites: Biology 30 and Chemistry 30. Note: BIOL 107 is not a prerequisite for BIOL 108. BIOL 107 and 108 can be taken in either term.

### **O** BIOL 108 Introduction to Biological Diversity

★3 (fi 6) (either term, 3-1s-3). Examines the major lineages of life on Earth. Overview of evolutionary principles and classification, the history of life, and the key adaptations of prokaryotes, protists, fungi, plants, and animals. Laboratories survey the diversity of biological form and function, and introduce students to data collection and scientific writing. Prerequisite: Biology 30. Note: BIOL 107 is not a prerequisite for BIOL 108. BIOL 107 and 108 can be taken in either term.

### **O** BIOL 201 Eukaryotic Cellular Biology

★3 (fi 6) (either term, 3-0-0). A structural and functional dissection of a eukaryotic cell. Detection of specific molecules at the ultrastructural level; plasma membrane structure and function; cytoskeleton involvement in intracellular transport, mitosis, and cytokinesis; the endomembrane system, protein targeting, exocytosis and endocytosis; nuclear structure and function; cell cycle control and cancer. Prerequisite: BIOL 107 and a 100-level Chemistry course, or SCI 100. Note: Not to be taken by students with credit in CELL 201, in addition, not available to students currently enrolled in CELL 201.



**BIOL 207 Molecular Genetics and Heredity**

★3 (fi 6) (either term, 3-1s-3). The chromosomal and molecular basis for the transmission and function of genes. The construction of genetic and physical maps of genes and genomes. Strategies for the isolation of specific genes. Examples of regulatory mechanisms for the expression of the genetic material in both prokaryotes and eukaryotes. Prerequisite: BIOL 107 or SCI 100.

**BIOL 208 Principles of Ecology**

★3 (fi 6) (either term, 3-0-3). Ecology is the scientific study of interactions between organisms and their environment in a hierarchy of levels of organization: individuals, populations, communities, and ecosystems. Provides a comprehensive survey of general concepts that can stand alone or serve as preparation for advanced courses in ecology. Labs emphasize collection, analysis, and interpretation of data from ecological experiments and field studies to illustrate and complement lecture material. Examples are drawn from a broad range of organisms and systems. Prerequisite: BIOL 108 or SCI 100. Open to students in the BSc Forestry and BSc Forest Business Management program once they have completed REN R 120 and ENCS 201.

**BIOL 299 Research Opportunity Program**

★1.5 (fi 3) (either term, 0-0-3). A credit/no-credit course for supervised participation in a faculty research project. Normally taken after completion of a minimum of ★30 but not more than ★60 in a program in the Faculty of Science. Prerequisite: GPA of 2.5 or higher, a 100 or 200 level course in the field of research and consent of Department. Normally taken in addition to a full course load. Project and course information available at ROP website or Department of Biological Sciences. Note: Application does not guarantee an ROP position. Credit may be obtained twice.

**BIOL 315 Biology: An Historical Perspective**

★3 (fi 6) (second term, 3-0-0). An outline of the scientific foundations of biological discovery to the mid-20th century. Students must have a sophisticated understanding of modern concepts in biology, be prepared to write a major essay on a focused topic, deliver an oral presentation and participate actively in class discussion. Prerequisite: a third-year course in the biological sciences or consent of instructor.

**BIOL 321 Mechanisms of Evolution**

★3 (fi 6) (first term, 3-1s-0). Discusses the major features of the evolutionary process, including the fossil record, basic population genetics, variation, natural selection, adaptation, and speciation. Seminars involve critiquing scientific literature and problem-solving in evolutionary genetics. Prerequisites: BIOL 108 and 207. SCI 100 may be used in lieu of BIOL 108.

**BIOL 330 Introduction to Biological Data**

★3 (fi 6) (second term, 3-0-3). Expands on prior introductions to the scientific method and examines the steps involved in the planning, collection, organization, analysis and presentation of biological data. Classes will explore the types of data used to answer a variety of biological questions and will review several different sampling designs, assess the benefits and limitations of various data types for scientific inference, and integrate the statistical methods that are common to other introductory courses. Labs will teach students how spreadsheets and relational databases can be used to manipulate, analyze, and present the results of scientific research. Prerequisites: BIOL 208 and STAT 151 and consent of instructor.

**BIOL 331 Population Ecology**

★3 (fi 6) (second term, 3-0-3). Principles of population ecology as they apply to plants and animals; population consequences of variation among individuals; habitat structure and population structure; habitat selection and foraging theory; life tables, demography, and the evolution of life history patterns; population dynamics; interactions among organisms (predation, competition, mutualism); and population regulation. Prerequisites: BIOL 208; any one of MATH 113, 115, 120 or SCI 100; STAT 151.

**BIOL 332 Community Ecology**

★3 (fi 6) (second term, 3-3s-0). Principles of community ecology, applied to plants and animals. The nature of communities, functional groups and rarity; niche theory and competition; disturbance and other alternatives to competition; food webs (predation, herbivory and disease); diversity (determinants, functional consequences and gradients); island communities. Prerequisites: BIOL 208; STAT 151; and any one of MATH 113, 115, 120 or SCI 100. Offered in alternate years. May not be taken for credit if credit already obtained in ZOO 332.

**BIOL 333 Wetland Ecology and Management**

★3 (fi 6) (first term, 3-0-3). Introduction to the ecology of wetland ecosystems, communities and plants. Major topics include landscape features, hydrological and chemical cycles of wetlands, wetland communities and major flora and fauna. Emphasis will be on wetlands in Western Canada including the bog, fen and marsh systems in boreal Alberta, prairie and montane wetlands. Loss or alteration of wetlands due to human activity is documented. A field trip is required. Prerequisite: BIOL 208. Credit may be obtained in only one of BOT 333 and BIOL 333.

**BIOL 335 Principles of Systematics**

★3 (fi 6) (second term, 3-0-0). An introduction to the principles, methods, and applications of biological systematics, including reconstruction of phylogenies,

creation of synthetic and cladistic classifications, historical interpretation of geographic distributions, and applications in evolutionary biology. Each student will analyze phylogenetic data and write a description of a species and its relationships. Prerequisites: BIOL 108 or SCI 100 and a 200-level Biological Sciences course; BIOL 321 strongly recommended.

**BIOL 340 Global Biogeochemistry**

★3 (fi 6) (second term, 3-0-0). An introduction to biogeochemical cycles in the environment. Discusses processes and reactions governing cycles in the atmosphere, lithosphere, terrestrial ecosystems, freshwater wetlands and lakes, river estuaries, and the oceans. Outlines the global cycles of water, carbon, nitrogen, phosphorus, and sulfur. Group discussions will incorporate current topics in anthropogenic alterations of natural cycles that lead to ecosystem degradation. Prerequisites: CHEM 101 or SCI 100 and BIOL 208; MICRB 265 strongly recommended.

**BIOL 341 Ecotoxicology**

★3 (fi 6) (either term, 3-0-0). An overview of the adverse effects of chemicals or physical agents on biological systems in an ecological context. This course takes a multidisciplinary approach to understanding biological effects and their assessment. Prerequisites: BIOL 208, ZOO 241, and CHEM 164 or 261, or instructor consent.

**BIOL 361 Marine Science**

★3 (fi 6) (second term, 3-0-0). An introduction to marine science and marine biology including history of marine exploration, essential features of the physical marine environment, a survey of major marine communities and adaptations of the organisms that live in each, overviews of selected groups of marine organisms (e.g., marine mammals), and human impact on the oceans. Recommended as preparation for courses offered through the Bamfield Marine Station (see courses listed under MA SC). Prerequisite: ZOO 250 or BIOL 208.

**BIOL 364 Freshwater Ecology**

★3 (fi 6) (first term, 3-1s-0). An introduction to the ecology of freshwater ecosystems. Lectures will examine the roles of biota in ecological patterns and processes in lakes, ponds, rivers, and streams, emphasizing north-temperate and boreal regions. Seminars will focus on recent papers from the primary literature. Designed to stand-alone or to provide a biological complement to BIOL 464. Prerequisite: BIOL 208.

**BIOL 365 Methods in Freshwater Ecology**

★3 (fi 6) (first term, 1-0-3). A practical course introducing students to techniques used in the field and lab to biomonitor lakes and streams. Topics covered will include plankton production and composition, fish and benthos community structure, herbivory and predation, and paleolimnology. The laboratory component includes field trips and independent research projects. Pre or corequisite: BIOL 364 or permission of instructor.

**BIOL 366 Northern Ecology**

★3 (fi 6) (second term, 3-0-0). Examines the ecology of boreal, arctic, and alpine ecosystems, including postglacial history, climate, geology, nutrient cycling and energy flow in forests, wetlands, lakes and marine systems, animal and plant adaptations to cold and current human impacts. Prerequisite: BIOL 208.

**BIOL 367 Conservation Biology**

★3 (fi 6) (first term, 3-0-0). This course introduces the principles of conservation biology with an emphasis on ecological processes operating at population, community and ecosystem levels of organization. Threats to biological diversity, ranging from species introductions to habitat destruction will be discussed along with conservation solutions ranging from the design of protected areas through conservation legislation. Prerequisite: BIOL 208. Credit cannot be obtained in both BIOL 367 and ENCS 364.

**BIOL 380 Genetic Analysis of Populations**

★3 (fi 6) (second term, 3-1s-0). Application of molecular biology to the study of systematics, structure of natural populations, mating systems, and forensics. Among the topics discussed are molecular techniques used to detect genetic variation in natural populations, methods to construct phylogenies using molecular data, mathematical models of population structure, paternity analysis, and DNA fingerprinting. Prerequisite: BIOL 207. BIOL 321 recommended.

**BIOL 381 People, Pollution, and the Environment**

★3 (fi 6) (first term, 3-0-0). The impacts of anthropogenic pollutants on ecosystems. This course first examines human population growth and non-sustainable resource extraction and then discusses the movement of pollutants through the atmosphere and biosphere, methods of detecting pollutants, and their ecological impacts. Information from lectures on specific pollutants (including carbon dioxide, nutrients, acid emissions, pesticides, endocrine disruptors, mercury and other metals, oil spills, radiation) will be used to discuss how humans value ecosystems, environmental law and policy, and specific environmental regulations in Alberta and the rest of Canada. Prerequisite: Biology 208.

**BIOL 391 Techniques in Molecular Biology and Bioinformatics**

★3 (fi 6) (either term, 0-1s-6). A laboratory course introducing students to techniques in gene manipulation, protein expression and bioinformatics by following a gene through a thematic series of molecular manipulations. Restricted to Honors and Specialization students in Biological Sciences and consent of instructor.

Prerequisites: BIOL 207 and BIOC 200. Not to be taken by students currently enrolled in GENET 420 or with credit in GENET 420. Credit can be obtained for only one of BIOL 391, IMIN 391 or MMI 391.

**O BIOL 392 Laboratory Techniques in Molecular Ecology and Systematics**

★3 (fi 6) (second term, 0-1s-6). A laboratory course introducing students to current molecular biology techniques and associated analyses used to study population genetics, systematics, and evolutionary biology in natural populations. Students will develop microsatellite marker systems and use them to examine the genetic structure of a natural population. A comparative bioinformatic approach will be used to generate sequence data to investigate the use of single nucleotide polymorphisms in candidate gene analysis and in phylogenetic inference. Prerequisite: BIOL 207, 208 and consent of instructor, corequisite: BIOL 380. Note: BIOL 392 and 592 cannot both be taken for credit.

**O BIOL 400 Industrial Internship Practicum**

★3 (fi 6) (either term, 0-3s-0). Required by all students who have just completed a Biological Sciences Industrial Internship Program. Must be completed during the first academic term following return to full-time studies. Note: A grade of F to A+ will be determined by the student's job performance as evaluated by the employer, by the student's performance in the completion of an internship practicum report, and by the student's ability to learn from the experiences of the Internship as demonstrated in an oral presentation. Prerequisite: WKEXP 955 and 956.

**O BIOL 421 Molecular Evolution and Systematics**

★3 (fi 6) (first term, 3-0-3). Methods for inferring evolutionary trees and their applications to the fields of comparative biology, molecular evolution, and systematics. Topics to be covered include phylogenetic inference, molecular evolution integrated at the organismal and population level, and evolutionary developmental genetics. Labs emphasize practical experience in data analysis. Prerequisite: BIOL 335 or consent of instructor. BIOL 380 or 392 recommended. Credit cannot be obtained for both BIOL 421 and BIOL 521. Offered in alternate years.

**O BIOL 430 Experimental Biology**

★3 (fi 6) (either term, 3-0-3). Emphasis is on the design of experiments and analysis of data collected from field and laboratory studies in Biology. Prerequisites: STAT 141 or 151 and a 300-level Biological Sciences course. Credit cannot be obtained for both BIOL 430 and REN R 480.

**O BIOL 432 Methods in Plant Ecology**

★3 (fi 6) (first term, 1-0-3). A field/laboratory course in which students will be introduced to common techniques used in plant ecology. Topics covered will include reproductive ecology, plant competition, field sampling, seed ecology, and community analysis. Prerequisites: BOT 332, STAT 151, and any university MATH course. SCI 100 may be used in lieu of MATH 114 or 115. The laboratory component includes field trips and independent research projects. Offered in alternate years.

**O BIOL 433 Plant-Animal Interactions**

★3 (fi 6) (second term, 3-0-0). Plants and animals have a long co-evolutionary history, and this course explores many of the ways in which plants and animals use and abuse each other. Specific topics include pollination biology, herbivory, and dispersal. Emphasis is on both the evolutionary ecology and ecological implications of these interactions. Prerequisite: BIOL 331 or 332 or BOT 332 or ZOO 371. Offered in alternate years.

**O BIOL 434 Chemical Ecology**

★3 (fi 6) (either term, 0-3s-0). An introduction to the broad field of Chemical Ecology through survey, discussion and analysis of current and historical literature. Topics include a wide array of chemically-mediated ecological interactions in a variety of taxa. Studies that analyze the importance of the use of chemical signals for habitat selection, resource acquisition, reproduction, defense and social interactions are discussed. Students research topics in Chemical Ecology and present their findings in oral and written formats. Prerequisite: BIOL 208. CHEM 164 or 261 recommended. Credit cannot be obtained for both BIOL 434 and 534. Offered in alternate years.

**BIOL 445 Current Topics in Animal and Cell Physiology**

★3 (fi 6) (first term, 0-3s-0). Survey, discussion and evaluation of literature dealing with current advances and selected topics in animal and cell physiology. Prerequisite: ZOO 340 or 342 or 343, or PHYS 372. Credit may be obtained more than once. Offered in alternate years.

**BIOL 450 The Ecology of Below-Ground Communities**

★3 (fi 6) (first term, 3-0-3). Survey of diversity and interactions among below-ground organisms, including trophic relationships, competition, facilitation and mutualism; adaptations of soil organism; causes and consequences of soil organism diversity. Laboratory sessions include identification of soil invertebrates, and field and laboratory methods for studying the ecology of below-ground organisms. Offered in alternate years. Prerequisite: BIOL 208 and consent of the instructor.

**O BIOL 464 Limnology**

★3 (fi 6) (second term, 3-0-3). Discussion of physical and chemical regimes in lakes, ecology of various aquatic organisms, calculation of hydraulic and chemical budgets, models used in lake management, and lake management problems such

as acid rain and eutrophication. Prerequisite: A 300-level Biological Sciences course (BIOL 364 recommended) and ★6 in University level Chemistry. Credit may be obtained for only one of ZOO 464 and BIOL 464.

**O BIOL 468 Problems in Conservation Biology**

★3 (fi 6) (second term, 0-3s-0). Seminar and reading course dealing with current problems in conservation biology. Prerequisites: BIOL 367 or ZOO 465 or ENCS 364 and consent of instructor. Credit cannot be obtained for both BIOL 468 and ZOO 468.

**O BIOL 471 Landscape Ecology**

★3 (fi 6) (second term, 3-0-3). Landscapes are holistic entities whose patterns influence ecological processes. Topics highlighted in this course include landscape components, morphology and dynamics; detecting spatial/temporal change in landscapes; issues of scales; movements of organisms, disturbances, and nutrients across landscape mosaics; and restoration, planning and management in a landscape context. Labs emphasize GIS applications to characterizing landscape patterns and heterogeneity in space and time, distributing and moving organisms across landscapes, and restoring or planning landscapes for conservation objectives. Prerequisites: MATH 115 or SCI 100; STAT 151; one of BIOL 331, 332 or BOT 332. Previous GIS course is useful. Credit cannot be obtained for both BIOL 471 and 571.

**O BIOL 490 Individual Study**

★3 (fi 6) (either term, 0-0-6). Registration will be contingent on the student's having made prior arrangements with a faculty member willing to supervise the program. Credit may be obtained more than once. Prerequisites: A 300-level Biological Sciences course and consent of the Associate Chair, Undergraduate Studies.

**BIOL 495 Special Topics in Biology**

★3 (fi 6) (either term, 0-3s-0). Covers specialized topics of current interest to advanced undergraduates in Biological Sciences. Consult the Department for details about current offerings. Prerequisite: consent of instructor. Credit for this course may be obtained more than once.

**O BIOL 498 Research Project**

★3 (fi 6) (either term, 0-0-6). Directed research in laboratory of an assigned member of the Biological Sciences Department. Successful completion of this course requires a written report on the research project. Credit may be obtained more than once. Prerequisites: A 300-level Biological Sciences course and consent of the Associate Chair, Undergraduate Studies.

**O BIOL 499 Research Project**

★6 (fi 12) (two term, 0-0-6). Directed research in the laboratory of an academic staff member of the Biological Sciences Department. Successful completion of this course requires an oral presentation and a written report on the research project. Prerequisites: A 300-level Biological Sciences course and the consent of the Associate Chair, Undergraduate Studies. Note: Students in Honors in Biological Sciences are required to successfully complete BIOL 499.

## Graduate Courses

### Notes

- (1) All 300- and 400-level courses in the Department of Biological Sciences may be taken for credit (except for BIOL 490, 498 and 499) by graduate students with approval of the student's supervisory committee.
- (2) The following courses may be taken as an option in graduate programs in the Department of Biological Sciences with approval of the student's supervisor or supervisory committee: BIOC 510, 520, 530, 541, 550, 555, 560; CHEM 361, 363, 461; CELL 300, 301; ENCS 510; IMIN 371, 372, 452, 501; MA SC 400, 401, 402, 410, 412, 420, 425, 430, 437, 440, 445, 470, 480; MMI 405, 415; NEURO 472; NU FS 363; PALEO 418, 419; PHARM 601.

**BIOL 501 Applied Bioinformatics**

★3 (fi 6) (first term, 3-1s-0). Discussion of computational tools and databases used in the analysis of data from high-throughput molecular biology studies. Students will use existing tools, learn the underlying algorithms and their limitations, and will be required to complete an individual research project. Prerequisite: consent of instructor. Credit cannot be obtained for both BIOIN 301 and BIOL 501.

**BIOL 506 Systematics and Evolution Forum**

★2 (fi 4) (either term, 1-1s-0). Lectures and discussions on a variety of subjects in systematics and evolutionary biology by graduate students, staff, and visiting speakers. Credit may be obtained more than once. Prerequisite: consent of instructors for students not registered in the systematics and evolution graduate program.

**BIOL 507 Seminars in Systematics and Evolution**

★1 (fi 2) (either term, 0-1s-0). Seminars in systematics and evolutionary biology. Credit may be obtained more than once. Prerequisite: consent of instructors for students not registered in the systematics and evolution graduate program.

**BIOL 521 Advanced Molecular Evolution and Systematics**

★3 (fi 6) (first term, 3-0-3). Methods for inferring evolutionary trees and their applications to the fields of comparative biology, molecular evolution, and systematics. Topics to be covered include phylogenetic inference, molecular evolution

integrated at the organismal and population level, and evolutionary developmental genetics. Labs emphasize practical experience in data analysis. Lectures and labs are the same as BIOL 421, but with additional assignments and evaluation appropriate to graduate studies. Prerequisite: Consent of instructor. Credit cannot be obtained for both BIOL 421 and BIOL 521. Offered in alternate years.

#### BIOL 534 Advanced Chemical Ecology

★3 (fi 6) (either term, 0-3s-0). An introduction to the broad field of Chemical Ecology through survey, discussion and analysis of current and historical literature. Topics include a wide array of chemically-mediated ecological interactions in a variety of taxa. Studies that analyze the importance of the use of chemical signals for habitat selection, resource acquisition, reproduction, defense and social interactions are discussed. Students research topics in Chemical Ecology and present their findings in oral and written formats. Graduate students complete an additional assignment and evaluation appropriate to graduate studies. Prerequisite: consent of instructor. Credit cannot be obtained for both BIOL 434 and 534. Offered in alternate years.

#### BIOL 545 Advanced Topics in Animal and Cell Physiology

★3 (fi 6) (first term, 0-3s-0). Survey, discussion and evaluation of literature dealing with current advances and selected topics in animal and cell physiology. Credit may be obtained more than once. Discussions are the same as for BIOL 445, but with additional assignments and evaluation appropriate to graduate studies. Enrolment of students by consent of instructor. Offered in alternate years.

#### BIOL 560 Current Problems in Ecology

★3 (fi 6) (either term, 0-3s-0). Seminar and reading on current problems concerning selected aspects of ecology. More than one section may be available and topics change from year to year. Please consult the Department for current information. Credit for this course may be obtained more than once. Prerequisite: at least one 400-level ecology course.

#### BIOL 570 Models in Ecology

★3 (fi 6) (second term, 0-3s-1). Formulation, analysis, parameterization, and validation of quantitative models for ecological processes. Applications include population dynamics, species interactions, movement, and spatial processes. Approaches include classical hypothesis testing, computer simulation, differential equations, individual-based models, least squares, likelihood, matrix equations, Markov processes, multiple working hypotheses, and stochastic processes. The lab covers computer simulation methods. Prerequisite: consent of Instructor. Offered in alternate years.

#### BIOL 571 Landscape Ecology and Applications

★3 (fi 6) (second term, 3-0-3). Landscapes are holistic entities whose patterns influence ecological processes. Topics highlighted in this course include landscape components, morphology and dynamics; detecting spatial/temporal change in landscapes; issues of scales; movements of organisms, disturbances, and nutrients across landscape mosaics; and restoration, planning and management in a landscape context. Labs emphasize GIS applications to characterizing landscape patterns and heterogeneity in space and time, distributing and moving organisms across landscapes, and restoring or planning landscapes for conservation objectives. Lectures and labs are the same as for BIOL 471, but with an additional research project and evaluation appropriate to graduate studies. Prerequisite: consent of instructor. Credit cannot be obtained for both BIOL 471 and 571.

#### BIOL 592 Laboratory Techniques in Molecular Ecology and Systematics

★3 (fi 6) (second term, 0-1s-6). A laboratory course introducing students to current molecular biology techniques and associated analyses used to study population genetics, systematics, and evolutionary biology in natural populations. Students will develop microsatellite marker systems and use them to examine the genetic structure of a natural population. A comparative bioinformatic approach will be used to generate sequence data to investigate the use of single nucleotide polymorphisms in candidate gene analysis and in phylogenetic inference. Labs are the same as BIOL 392, but with additional assignments and evaluation appropriate to graduate studies. Prerequisite: consent of instructor, corequisite: BIOL 380. Credit cannot be obtained for both BIOL 392 and 592.

#### BIOL 595 Special Topics in Biology

★3 (fi 6) (either term, 0-3s-0). Covers specialized topics of current interest to graduate students in Biological Sciences. Consult the Department for details about current offerings. Prerequisite: consent of instructor. Credit for this course may be obtained more than once.

#### BIOL 601 Philosophy, Sociology, and Politics of Science

★3 (fi 6) (first term, 3-0-0). Influences of current philosophical concepts, and the sociological and political realities, on biological research and teaching. Offered in alternate years. Credit for this course may be obtained more than once.

#### BIOL 603 Advanced Ecology

★3 (fi 6) (either term, 0-3s-0). Designed for new graduate students in environmental biology to foster critical thinking and discussion and to introduce them to issues of experimental design and analysis and different approaches to ecology. The course involves student discussion of papers, lectures by faculty members on their research, seminars by students and a written assignment. Prerequisite: consent of instructor. Preference will be given to students in Biological Sciences.

#### BIOL 631 Seminar in Ecology

★1 (fi 2) (either term, 0-2s-0). Credit may be obtained more than once.

#### BIOL 633 Advanced Techniques in Biology

★1 (fi 2) (either term, 0-2s-0). This course will cover specialized topics of current interest to graduate students in Biological Sciences with an emphasis on learning new research skills. Prerequisite: consent of Instructor. Credit for this course may be obtained more than once.

#### BIOL 642 Seminars in Physiology, Cell and Developmental Biology

★1 (fi 2) (either term, 0-2s-0). Credit may be obtained more than once.

## 231.66 Biomedical Engineering, BME

Department of Biomedical Engineering  
Faculty of Medicine and Dentistry

**Note:** See also EE BE 512 and 540 which may be taken as courses in this discipline.

### Undergraduate Courses

#### BME 320 Human Anatomy and Physiology: Cells and Tissue

★3 (fi 6) (first term, 3-0-0). An introduction to the fundamental levels of organization of the human body highlighted in engineering terms. The first half of the course will consider the chemical, cellular, and tissue levels of organization. The second half of the course will be devoted to bone, joints, muscle, and neural tissue. Guest lectures will include engineers and medical scientists to discuss the relationship between recent advances in biomedical engineering and the underlying anatomy and physiology. This course is intended for students in the Faculty of Engineering. Students from other faculties must obtain the consent of the Department of Biomedical Engineering. Credit may be obtained for only BME 210 or 320.

#### BME 321 Human Anatomy and Physiology: Systems

★3 (fi 6) (second term, 3-0-0). An introduction to the organization of the human body at the level of the anatomical systems highlighted in engineering terms. Lectures will be devoted to the circulatory, respiratory, digestive, urinary, nervous and endocrine systems, and fluid, electrolyte and acid-base homeostasis. Guest lectures will include engineers and medical scientists to discuss the relationship between recent advances in biomedical engineering and the underlying anatomy and physiology. This course is intended for students in the Faculty of Engineering. Students from other faculties must obtain the consent of the Department of Biomedical Engineering. Credit may be obtained for only BME 211 or 321. Prerequisite: BME 320 or consent of Instructor.

#### **O** BME 410 Introduction to Biomedical Engineering and Biomedical Systems Modelling

★3 (fi 6) (second term, 3-0-0). Introduces the broad field of biomedical engineering while focusing on the quantitative methods and modelling in key areas that emphasize the similarities between biomedical and conventional engineering science. Practical numerical models of several body systems will be covered, with an emphasis on development, evaluation and validation of realistic physiological models using computational methods. Intended primarily for undergraduate students of the Engineering program. Students from other faculties must obtain the consent of the Department of Biomedical Engineering. Prerequisite BME 320.

### Graduate Courses

#### **O** BME 513 Imaging Methods in Medicine

★3 (fi 6) (second term, 3-0-0). Introduction to basic physical and technological aspects of medical imaging. Emphasis on computed transmission and emission tomography, magnetic resonance, and ultrasound imaging. These methods are developed and contrasted in terms of how imaging information is generated, detected, and processed and how different hardware configurations and other factors limit image quality. Relative diagnostic potential of the imaging methods is also discussed in relation to future prospects of each method.

#### BME 529 Statistics for Biomedical Engineering

★3 (fi 6) (second term, 3-0-0). This course is intended to be practical rather than theoretical, and is directed toward biomedical engineering students. Topics consist of two-sample comparisons using t-tools and alternatives; analysis of variance and multiple comparison procedures; linear regression models; time series models; tools for multivariate data; logistic regression; elements of research design. An attempt will be made to tailor examples and, if possible, topics to students' areas of interest. Prerequisite: an introductory course in statistics and consent of Department. Available to students in a biomedical engineering program only except by special permission.

#### BME 530 Topics in Biomedical Engineering

★3 (fi 6) (either term, 3-0-0). Individual sections covering such topics as signal processing and rehabilitation engineering. Prerequisite: consent of Instructor.

#### BME 541 Biomaterials in Medicine

★3 (fi 6) (first term, 3-0-0). This course is intended for graduate and advanced



undergraduate students interested in biomaterials science. Students from the faculties of Medicine, Pharmacy and Pharmaceutical Sciences, and Engineering are suitable to participate in this course. The first half of the course concentrates on biomaterials currently used in medicine. The second half of the course aims to familiarize the students with the current research activity in the field. Prerequisite: consent of Instructor.

**BME 553 Rehabilitation Engineering: Assisted Movement after Injury**  
★3 (fi 6) (first term, 3-1s-0). Introduction to rehabilitation techniques for assisting individuals with physical disabilities to reach, stand and walk. Biomechanics of intact and pathological movements and the use of assistive devices such as exoskeletal orthotics, neuroprosthetic devices and locomotor training are emphasized. Students are exposed to the concepts of biomechanical modeling, motion analysis, electrical stimulation, control systems, neuroregeneration, and pharmacology. Prerequisite: BME 320 and 321 or consent of Instructor.

**BME 564 Fundamentals of Magnetic Resonance Imaging, MRI**

★3 (fi 6) (second term, 3-0-0). Designed for graduate and advanced undergraduate students requiring a thorough grounding in the fundamentals of imaging by means of nuclear magnetic resonance, NMR. Topics include the principles of nuclear magnetic resonance as applied to imaging, image processing, imaging techniques for achieving specific types of contrast, image artifacts, and typical applications. Prerequisite: consent of Instructor.

**BME 575 Magnetic Resonance in Medicine**

★3 (fi 6) (either term, 3-0-1/2). The physical principles behind the application of nuclear magnetic resonance (NMR) spectroscopy and imaging in fields ranging from biochemistry to clinical medicine. Topics include Fourier transform NMR, in vivo spectroscopy and a practical overview of magnetic resonance imaging (MRI) through numerical simulations and hands-on experiments on an MRI scanner. Students will acquire and analyze images of the brain, heart and blood vessels. Designed for advanced honors and graduate students interested in the application of NMR spectroscopy and magnetic resonance imaging to biological systems. Prerequisite: BME 513 or 564 and consent of Instructor.

**BME 579 Topics in Medical Physics**

★3 (fi 6) (either term, 3-0-0). Individual sections dealing with such topics as computed tomography, nuclear magnetic resonance, therapeutic radiation. Prerequisite: consent of Instructor.

**BME 583 Advanced Rehabilitation Engineering and Assistive Devices**

★3 (fi 6) (second term, 3-1s-0). This course is a continuation of the concepts introduced in BME 553 and focuses in more depth on the biomechanics and neural control of leg and arm movements in health and disease, and emphasizes quantitative assessment methods and rehabilitation engineering approaches for alleviating disability after neural injury or disease. Topics will include the kinematics and kinetics of walking and reaching, the neural control of walking and reaching, orthotics and robotics (as rehabilitation interventions and assistive devices) and functional electrical stimulation for improving walking, reaching and grasping after spinal cord injury, head trauma, stroke or Parkinson's disease. The course is intended for graduate students but advanced undergraduate students (4th and 5th year) in Engineering and Science may also enroll. Prerequisites: BME 553 and BME 410 or EEBE 512 or EEBE 540 or equivalent. Instructor consent is required.

**BME 599 Project in Biomedical Engineering**

★3 (fi 6) (either term, 0-0-6). Practical application of science to problems in health care; involves report on problem and alternative solutions, plus complete demonstration and documentation of chosen solution. Prerequisite: Any BME course and consent of Department.

**BME 600 Seminars in Biomedical Engineering**

★2 (fi 4) (two term, 0-1s/2-0). Series of seminars exposing graduate students to the various areas of research and providing a forum for progress reports in individual areas. Seminars by research workers from inside and outside the University are included. Seminars are informal with ample opportunity for discussion.

**BME 630 Advanced Topics in Biomedical Engineering**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

## 231.67 Botanique, BOTQ

Faculté Saint-Jean

### Cours de 1er cycle

**BOTQ 380 Plantes médicinales**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Survol de l'utilisation historique et courante des plantes qui produisent des médicaments ou des drogues. Évaluation de la chimie et de la physiologie des composés biologiquement actifs (toxiques, analgésiques et hallucinogènes) et l'utilisation courante de ces produits végétaux. Utilisation de la biotechnologie des végétaux pour développer des plantes qui produisent des composés médicamenteux. Préalable: ★3 de niveau 200 en sciences biologiques.

The most current Course Listing is available on Bear Tracks.

## 231.68 Botany (Biological Sciences), BOT

Department of Biological Sciences  
Faculty of Science

**Notes**

- (1) See the following sections for listings of other Biological Sciences courses: Bioinformatics (BIOIN); Biology (BIOL); Entomology (ENT); Genetics (GENET); Microbiology (MICRB); Zoology (ZOO).L.
- (2) See the following sections for listings of other relevant courses: Interdisciplinary Studies (INT D); Immunology and Infection (IMIN); Marine Science (MA SC); Paleontology (PALEO).

### Undergraduate Courses

**BOT 205 Fundamentals of Plant Biology**

★3 (fi 6) (first term, 3-0-3). An overview of the diversity and biology of organisms traditionally included in the Plant Kingdom (algae, fungi, lichens, mosses, ferns, gymnosperms and flowering plants). Emphasis throughout the course is on the relationship between structural and functional innovations in plants and how these have influenced their reproduction and evolution in various ecosystems. Symbioses and co-evolutionary relationships between or among different kinds of plants, and with other groups of organisms, are also considered. Prerequisite: BIOL 108 or SCI 100. Credit cannot be obtained for both BOT 205 and PL SC 221.

**BOT 210 Biology of Land Plants**

★3 (fi 6) (second term, 3-0-3). Comparative survey of vascular plants and bryophytes focusing on their morphology, classification and phylogeny. Emphasis on living plant groups with some paleobotanical evidence presented. Prerequisite: BIOL 108 or SCI 100.

**BOT 303 Plant Development**

★3 (fi 6) (second term, 3-0-0). The generation of a functional plant requires the spatially coordinated acquisition of numerous cell identities. Examines developmental processes in plants at the molecular and cellular level and will cover: body axis establishment and tissue pattern formation during embryogenesis, cell-to-cell communication in patterning events and differentiation processes, and cell differentiation patterns in tissue systems. Emphasis throughout the course will be on current research using developmental mutants. Prerequisites: BIOL 201 and 207; one of BOT 205, 210 or 240/340 strongly recommended.

**BOT 306 Biology of the Fungi**

★3 (fi 6) (second term, 3-0-3). The Kingdom Fungi, including yeast, molds, mushrooms, rusts, smuts, mildews, etc., is one of the most diverse groups of living organisms and plays important roles in nutrient cycling in ecosystems, pathogenesis in plants and animals, industrial processes, etc. This course offers a systematic overview of the morphology and ecology of fungi and the relevance of these organisms to human affairs. Laboratories offer a selection of fungi for detailed study and permit students to develop and identify pure cultures of fungi from soil, wood and other materials. Prerequisites: BIOL 108 or SCI 100 and a 200-level Biological Sciences course. BOT 205 recommended.

**BOT 308 Plant Anatomy**

★3 (fi 6) (first term, 3-0-3). Seed plant structure and development with particular emphasis on flowering plants. The course covers origin, development, and function of meristems (apical, primary, and lateral), tissue and organ development, wood structure and identification, floral anatomy, embryogenesis, and fruit structure. Prerequisites: BIOL 108 or SCI 100. BOT 205 recommended. May not be taken for credit if credit already obtained in BOT 209 or 309.

**BOT 310 Morphology and Evolution of Seed Plants**

★3 (fi 6) (first term, 3-0-3). The seed was one of the major innovations in land plant evolution. Since their origin in the Devonian Period, seed plants have become the dominant group on land. This course examines the origins, early evolution and subsequent diversity of seed plant groups with an emphasis on morphology. Only a small fraction of the diversity of seed plants remains today. This course frames the diversity of living seed plant groups (Cycads, Ginkgos, Gnetophytes, Conifers and Angiosperms) in terms of a much greater fossil record. Prerequisite: BOT 210 or consent of Instructor. BOT 205 recommended. Offered in alternate years.

**BOT 314 Biology of Bryophytes**

★3 (fi 6) (first term, 3-0-3). Bryophytes (hornworts, liverworts and mosses) form a unique group of basal land plants that are pivotal for understanding evolution of life in terrestrial environments. This course covers the evolution, systematics and ecological diversity of bryophytes of the world, using morphological, molecular and developmental data. Prerequisite: BIOL 108 or SCI 100 and a 200-level Biology course (BOT 205 or 210 recommended) or consent of instructor.

**BOT 321 Flowering Plants**

★3 (fi 6) (second term, 3-0-3). Modern approaches to the classification and evolution of the flowering plants. The diversity and relationships of the angiosperms are examined from a phylogenetic perspective. Topics include practical and theoretical aspects of species description, nomenclature and phylogeny interpretation, with a focus on the characteristics and significance of the major families of flowering plants in Alberta and from around the world. Prerequisite: BIOL 108 or SCI 100.

<https://www.beartracks.ualberta.ca>

BOT 205 recommended. May not be taken for credit if credit already obtained in BOT 220 or 320.

#### **O BOT 322 Field Botany**

★3 (*fi 6*) (first term, 3-0-3). Lectures, laboratory, and field exercises provide an introduction to description and identification of plants and their local habitats. Factors affecting variation in natural vegetation and methods used to describe it are discussed. Field exercises and projects take place during the two weeks preceding the fall term and some may take place off campus. Presentations take place during the first four weeks of class time in September. Prerequisites: BIOL 108 or SCI 100 and any 200-level Biology course. (BOT 321 is strongly recommended). May not be taken for credit if credit already obtained in BOT 304.

#### **O BOT 330 Biodiversity and Ecosystem Function of Algae**

★3 (*fi 6*) (second term, 3-0-3). The remarkable biodiversity of algae provides the foundation for most aquatic ecosystems around the world. This course emphasizes the evolution, taxonomy, and ecology of major groups of algae to illustrate relationships between their form and function in pristine and polluted environments. Laboratories will focus on the taxonomic diversity of algae through the use of field surveys of local streams and lakes, and experiments using our extensive algal culture collection. Prerequisite: 200-level Biology course. Both BOT 205 and BIOL 208 recommended.

#### **O BOT 332 Plant Ecology**

★3 (*fi 6*) (first term, 3-0-3). Study of the local factors, which limit plant growth, reproduction, and diversity. Particular emphasis on the mechanisms by which plants interact with their local environment and the effects of these interactions on diversity and community functioning. Specific topics include plant foraging, germination ecology, mechanisms of competition and facilitation, patterns of diversity, and community stability. Prerequisites: BIOL 208, STAT 151, and any university MATH course. SCI 100 may be used in lieu of MATH 114 or 115. BOT 205 recommended.

#### **O BOT 340 Plant Physiology**

★3 (*fi 6*) (first term, 3-0-3). This course explores how plants function. Topics include water transport and the soil-plant-atmosphere continuum, photosynthesis and carbon resource utilization, nitrogen nutrition and symbioses, photosensing, and responses to environmental stresses such as attack by pests and pathogens. Laboratories introduce both classical and contemporary methods in plant physiology. Prerequisites: BIOL 107; CHEM 101 or 164 or 261; and a 200-level Biological Sciences course or PL SC 221. Credit cannot be obtained for both BOT 240 and 340. SCI 100 may be used in lieu of BIOL 107 and CHEM 101.

#### **O BOT 350 Plant Biochemistry**

★3 (*fi 6*) (first term, 3-0-0). Introduction to biochemistry of higher plants. Emphasis on plant-specific metabolic processes, and their regulation and molecular biology. Topics include structural and storage carbohydrates, lipid metabolism, nitrogen fixation and assimilation, photosynthetic processes, and secondary plant metabolites and their ecological functions. Prerequisites: BIOCH 200 or BIOCH 203 or 220. BOT 205 recommended. May not be for credit if credit already obtained in BOT 250.

#### **O BOT 380 Drug Plants**

★3 (*fi 6*) (second term, 3-0-0). Survey of historical and current use of important drug-producing plants. Evaluation of the chemistry and physiology of biologically active compounds from poisonous, analgesic, and hallucinogenic plants, and the current uses of such plant products. Use of plant biotechnology to develop drug-producing plants. Prerequisite: a 200-level Biological Sciences course or BIOCH 200. BOT 205 recommended.

#### **O BOT 382 Plant Biotechnology**

★3 (*fi 6*) (second term, 3-0-0). Using examples from current research, techniques used in modern plant biotechnology and the way this technology is being used to modify and improve economically important plants and their use as biofactories will be discussed. Specific topics will include; gene isolation, plant transformation, plant tissue culture, clonal plant propagation, and somatic embryogenesis. Prerequisites: BIOL 107 or SCI 100 and a 200-level Biological Sciences course. BOT 205 recommended. Note: Credit cannot be obtained for both BOT 382 and PL SC 491.

#### **O BOT 384 Global Change and Ecosystems**

★3 (*fi 6*) (second term, 3-0-0). Ecological impacts of climate change and large-scale human activities on terrestrial and aquatic ecosystems. The focus of this course is to learn to write brief technical summaries of current environment issues, in a fashion that can be understood by an educated citizen. Topics such as climate change, water management projects, invasion of exotic species and national parks management are presented as the forum to evaluate options, trade-offs and solutions to environmental social issues. Prerequisites: BIOL 208 or consent of Instructor. BOT 205 recommended.

#### **O BOT 411 Paleobotany**

★3 (*fi 6*) (first term, 3-0-3). The fossil record of plants as it relates to the evolutionary history of existing groups. Prerequisite: A 300-level Biological or Earth Sciences course and BOT 205 or 210 or consent of Instructor. Offered in alternate years.

#### **O BOT 445 Molecular Plant Physiology**

★3 (*fi 6*) (second term, 3-0-0). Plant responses to their environment are underpinned by myriad molecular events. This course examines the molecular and cellular biology of plant responses to environmental cues, with an emphasis on signalling and regulation of gene expression mediating physiological responses. Topics such as plant cell walls, phytohormone action, photoreceptors, and programmed cell death will be covered. Prerequisite: BOT 382 or GENET 364 or consent of the instructor. BOT 240 or 340 recommended. Credit cannot be obtained for both BOT 445 and BOT 545. Offered in alternate years.

#### **O BOT 464 Plant Functional Genomics**

★3 (*fi 6*) (second term, 3-0-0). Through a combination of lectures, discussions, and computer-based exercises, skills are taught for the analysis of large-scale molecular data sets (e.g. genomic, transcriptomic, or proteomic data). These analytical skills are applied to recently published studies to derive biologically relevant information about the physiology and development of plants. Prerequisite: GENET 364 or consent of the instructor. Credit cannot be obtained for both BOT 464 and 564. Offered in alternate years.

## Graduate Courses

### Notes

- (1) All 300- and 400-level courses in the Department of Biological Sciences may be taken for credit (except for BIOL 490, 498 and 499) by graduate students with approval of the student's supervisor or supervisory committee.
- (2) The following courses may be taken as an option in graduate programs in the Department of Biological Sciences with approval of the student's supervisor or supervisory committee. BIOCH 510, 520, 530, 541, 550, 555, 560; CHEM 361, 363, 461; CELL 300, 301; ENCS 510; IMIN 371, 372, 452, 501; MA SC 400, 401, 402, 410, 412, 420, 425, 430, 437, 440, 445, 470, 480; MMI 405, 415, 520; NEURO 472; NU FS 363; PALEO 418, 419; PHARM 601.

#### **BOT 506 Advanced Mycology**

★3 (*fi 6*) (second term, 1-3s-0). Reports and discussion of major and current research in the biosystematics and ecology of the fungi. Evaluation of methods of investigation in these areas. Offered in alternate years.

#### **BOT 511 Advanced Paleobotany**

★3 (*fi 6*) (second term, 3-0-3). Special problems in paleobotany involving laboratory techniques and readings of current literature and oral written presentation. Offered in alternate years.

#### **BOT 545 Advanced Molecular Plant Physiology**

★3 (*fi 6*) (second term, 3-0-0). Plant responses to their environment are underpinned by myriad molecular events. This course examines the molecular and cellular biology of plant responses to environmental cues, with an emphasis on signalling and regulation of gene expression mediating physiological responses. Topics such as plant cell walls, phytohormone action, photoreceptors, and programmed cell death will be covered. Lectures are the same as for BOT 445, but with additional assignments and evaluation appropriate to graduate studies. Prerequisite: Consent of the instructor. Credit cannot be obtained for both BOT 445 and 545. Offered in alternate years.

#### **BOT 564 Advanced Plant Functional Genomics**

★3 (*fi 6*) (second term, 3-0-0). Through a combination of lectures, discussions, and computer-based exercises, skills are taught for the analysis of large-scale molecular data sets (e.g. genomic, transcriptomic, or proteomic data). These analytical skills are applied to recently published studies to derive biologically relevant information about the physiology and development of plants. Scheduled classes are the same as for BOT 464, but with additional assignments and evaluation appropriate to graduate studies. Prerequisite: consent of the instructor. Credit cannot be obtained for both BOT 464 and 564. Offered in alternate years.

#### **BOT 600 Seminar in Plant Biology**

★1 (*fi 2*) (either term, 0-2s-0). Credit for this course may be obtained more than once.

## 231.69 Business, BUS

Department of Strategic Management and Organization  
Faculty of Business

**Note:** Enrolment in all BUS courses is restricted to students registered in the Faculty of Business, or to students registered in specified programs that require Business courses to meet degree requirements and who have obtained prior approval of their Faculty.

## Undergraduate Courses

#### **BUS 201 Introduction to Canadian Business**

★3 (*fi 6*) (first term, 2-0-1.5). Provides students with an introduction to the Faculty and the functional areas of business. Students improve computer, presentation, leadership and group skills. Areas covered include introductions to statistics

and research and selected areas from accounting, finance, information systems, marketing, operations, strategic management and others. Open only to students in the Faculty of Business.

#### **BUS 301 Business Communications**

★3 (*fi 6*) (either term, 3-0-0). This is a practical skill development course open to students of all majors in any year of a Business program. Good communication in business matters. This course will help develop writing confidence and strategies for professional business applications. The focus is on hands-on guided practice and uses business scenarios to emphasize technical and persuasive writing as well as an understanding of the skills required to begin a successful business career. In addition students will develop a strong resume, cover letter and a personal brand.

#### **BUS 435 Information, Ethics and Society**

★3 (*fi 6*) (either term, 3-0-0). For students in all majors who are interested in information and the roles it plays in business and society. Focus is on the nature and basic characteristics of information, and its importance in contemporary society, viewing information as a commodity that is produced, used, bought and sold. Two aspects of the ways in which information affects people are emphasized: (1) ethical issues relating to professions, businesses, government, and individuals; (2) the impact of information technology and technological change on society. Prerequisites: Open only to third or fourth year Business students, or by consent of the Department Chair. Credit may be granted for only one of ACCTG 435, BUS 435 or MIS 435.

#### **BUS 465 Internship**

★3 (*fi 6*) (either term, 3-0-0). Practical application of business skills and theory to a problem or issues addressed during a period of 13 - 16 weeks of placement in a work environment within Canada. The internship includes preliminary instruction and requires, under the supervision of the Faculty, an approved preliminary proposal and the presentation of a project report to the sponsoring organization. Prerequisites: Consent of the Business Undergraduate Office.

#### **BUS 466 International Internship**

★3 (*fi 6*) (either term, 3-0-0). Practical application of business skills and theory to a problem or issues addressed during a period of 13 - 16 weeks of placement in a work environment outside of Canada. The internship includes preliminary instruction and requires, under the supervision of the Faculty, an approved preliminary proposal and the presentation of a project report to the sponsoring organization. Prerequisites: Consent of the Business Undergraduate Office.

#### **BUS 480 Special Projects Course**

★3 (*fi 6*) (either term, 3-0-0). This course applies the techniques developed in several Business courses to a group project or a business case analysis. The emphasis in the projects is on integrated approaches to business problems. Student groups will work on consulting projects from businesses and other organizations in and near Edmonton. Groups will work on their projects under the supervision of the instructor(s). An approved preliminary proposal is required. Prerequisites: Consent of Instructor and the Undergraduate Office. Open only to fourth year students.

#### **BUS 488 Selected Topics in Business**

★3 (*fi 6*) (either term, 3-0-0). Normally restricted to third- and fourth year Business students. Prerequisite: consent of Faculty of Business. Additional prerequisites may be required.

#### **BUS 490 Business Competition Part I**

★1.5 (*fi 3*) (either term, 0-1.5s-0). Preparation for Student Competition in Business. Prerequisite: consent of Instructor.

#### **BUS 491 Business Competition Part II**

★1.5 (*fi 3*) (either term, 0-1.5s-0). Completion of Student Competition in Business. Prerequisite: BUS 490 and consent of Instructor.

## Graduate Courses

#### **BUS 501 Business Skills Orientation**

★0 (*fi 1*) (either term, variable). Orientation to the MBA program, including primers on team building, ethics and academic integrity, time/life management, public speaking, library resources, career planning and business etiquette.

#### **BUS 504 Career Management Skills**

★0 (*fi 1*) (either term, variable). Fundamentals of career success are covered, including letter writing, interviewing, career planning, company analysis, industry analysis and wealth building/management.

#### **BUS 505 Ethics and Corporate Social Responsibility with Communications**

★3 (*fi 6*) (either term, 3-0-0). This course focuses on the application of moral principles and models for ethical decision making to individuals and businesses in the 21st century. Contemporary ethical and social issues will be examined through the use of case studies, class discussions and presentations. Topics include concepts of individual ethics, workplace issues, corporate compliance and social and environmental responsibility. While examining ethical issues, emphasis will be placed on improving students' proficiency levels in verbal and written business communication.

#### **BUS 586 Selected Topics in Business**

★1.5 (*fi 3*) (either term, 3-0-0). Topics in this seminar may vary from year to year and are chosen at the discretion of the Instructor.

#### **BUS 601 Business Practicum**

★3 (*fi 6*) (two term, 3-0-0). Students are divided into groups and the groups are assigned a project in either a business or government organization. At the end of the course each group is required to write a report and to make a presentation derived from the project to the other groups in the course. Prerequisite: All required Year 1 MBA core courses.

#### **BUS 686 Selected Topics in Business**

★3 (*fi 6*) (either term, 3-0-0). Topics in this course may vary from year to year and are chosen at the discretion of the Instructor.

#### **BUS 701 Qualitative Methodology for Business Research**

★3 (*fi 6*) (either term, 3-0-0). Examines qualitative research methods as they apply to business research. Includes: the terrain and history of qualitative research, exploring different approaches to qualitative research, designing qualitative research, strategies of inquiry, qualitative data analysis, writing up research, and professional and ethical issues. Prerequisite: Registration in Business PhD Program or written permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

#### **BUS 715 Experimental Design for Behavioural Research**

★3 (*fi 6*) (either term, 3-0-0). This course teaches the principles of experimental design for the study of human behaviour. Experiments may be administered through surveys and on the Internet as well as in laboratory settings. Behavioural texts on experimental design rely heavily on weak between-subjects designs, whereas statistics texts favour engineering applications that are inherently simpler than the study of human behaviour. After explaining the principles of randomization and of efficient design, the course concludes by illustrating how more powerful designs can characterize human learning without confounding it with subjects' naive responses. BUS 715 is integrated and coordinated with BUS 716 - Computer-Based Experiments for Behavioural Research. However, it may be taken separately by arrangement with the instructor. Prerequisites: Registration in the Business PhD Program or permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students. Credit will not be granted for both MARK 715 and BUS 715.

#### **BUS 716 Computer-Based Experiments for Behavioural Research**

★3 (*fi 6*) (either term, 3-0-0). The learning goal for this course is the acquisition of the skills required to design and implement computer-based experiments for research in the behavioral social sciences. Students develop an understanding of the conceptual issues relevant to computer-based experimental research. They get an overview of the available software platforms, and obtain advanced skills in connection with one particular general-purpose platform. The course has a significant hands-on component that allows students to apply their acquired knowledge in the implementation of actual experiments that they plan to conduct. Prerequisites: Working knowledge of experimental design for behavioural research. (The recommended preparation for this course is BUS 715: Experimental Design for Behavioural Research.) Registration in the Business PhD Program or permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students. Credit will not be granted for both MARK 716 and BUS 716.

#### **BUS 717 Bayesian Modelling of Human Behaviour**

★3 (*fi 6*) (either term, 3-0-0). This course teaches how to model human behaviour using Bayesian computer software. The motivation for Bayesian data analysis is pragmatic -- Bayesian modelling allows researchers to analyze data on human behaviour in a manner consistent with behavioural theory, whereas traditional statistical analyses place greater restrictions on the types of data and models that can be analyzed. Programming is not involved, but it is necessary to describe, in terms of statistical distributions, a model of the data generation process. Prerequisites: Registration in the Business PhD Program or permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students. Credit will not be granted for both MARK 717 and BUS 717.

#### **BUS 855 International Study Tour**

★1.5 (*fi 16*) (second term, 18 hours). A week-long intensive course. Understanding the challenges facing local companies in their environment, for example, Asia or Eastern Europe. An on-site visit to the location is included. Restricted to Executive MBA students only.

#### **BUS 860 Special Topics**

★3 (*fi 32*) (either term, 3-0-0). Topics will vary from year to year. Restricted to Executive MBA students only.

#### **BUS 875 Special Topics**

★3 (*fi 32*) (either term, 3-0-0). Topics will vary from year to year. Restricted to Executive MBA students only.

#### **BUS 880 Business Project**

★3 (*fi 32*) (first term, 3-0-0). Students are required to conduct an operations audit on a client company and prepare a business plan. The company selected could be the student's own organization or an unit within the organization. Restricted to Executive MBA students only.



**BUS 885 Business Project**

★3 (*fi 32*) (second term, 3-0-0). Students will complete a custom-designed project for a client company under faculty supervision. Restricted to Executive MBA students only.

**BUS 900 Directed Research Project**

★3 (*fi 6*) (variable, unassigned).

**231.70 Business Economics, BUEC**

Departments of Marketing, Business Economics, and Law  
Faculty of Business

**Note:** Enrolment in all BUS courses is restricted to students registered in the Faculty of Business, or to students registered in specified programs that require Business courses to meet degree requirements and who have obtained prior approval of their Faculty.

**Undergraduate Courses****BUEC 311 Business Economics, Organizations and Management**

★3 (*fi 6*) (either term, 3-0-0). Business organizations as systems of mutually reinforcing functional areas where decision making is driven by underlying economic forces. Application of economic theory to facilitate complex decision making within organizations: economic models of decision making are linked directly to functional areas of management. Topics include the organization of firms and industries; meeting customer needs; and decision making involving production, resource use, dealing with risk and uncertainty, scale and scope of operations, competitive advantage, and product pricing. Prerequisites: ECON 101, 102, and MATH 113 or equivalent. Students may receive credit for only one of BUEC 301, BUEC 311, MANEC 301 or ECON 383. Not open to students with previous credit in ECON 281.

**BUEC 342 Introduction to International Business**

★3 (*fi 6*) (either term, 3-0-0). Provides students with an introduction to the tools they will require to succeed in the increasingly international business world. Serves as a basis for other more advanced courses in International Business. Topics covered could include Country Differences, International Trade, Foreign Direct Investment, Regional Economic Integration, The Foreign Exchange Market and International Business Strategy and Operations. Students may receive credit for only one of BUEC 342, 444 or ADMI 444.

**BUEC 442 The Global Business Environment**

★3 (*fi 6*) (either term, 3-0-0). Examines the changing global business environment and how it impacts international business decision-making. Topics covered could include Trends in Globalization, International Business in Canada, Managing Multinational Corporations, Importing and Exporting, International Labor Markets and the Market for Skills, International Financial Markets, Financial Crises, and Corporate Governance in Different Countries. Prerequisite: BUEC 342 or consent of Instructor. Students may receive credit for only one of BUEC 442, 445 or ADMI 445.

**BUEC 444 International Study Tours**

★3 (*fi 6*) (either term, 3-0-0). This course is a combination of on site study tours to a foreign country and academic coursework. The study tour component will normally be for a two to three week period, during which students will participate in company tours, lectures and language and cultural study to develop an appreciation for different business cultures and contexts. Upon return, students will be expected to complete a group project or case study relating to the business environment of the country under study. Prerequisites: Preference will be given to students who have completed at least one other international business course in the Faculty of Business.

**BUEC 454 Principles of Real Estate**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the principles of commercial real estate. Real estate markets and decision making; real estate economics and location; property development; marketing and property management; mortgage lending, real estate investment, brokerage and regulation. Industry guest speakers help link theory with industry practice in their areas of expertise. Prerequisites: BUEC 311 or consent of the instructor.

**BUEC 463 Energy and the Environment: Industry Structure, Performance and Challenges**

★3 (*fi 6*) (either term, 3-0-0). Uses the basic tools of business economics in order to gain a better understanding of energy markets and industries. Differences and similarities between specific industries (oil, gas, electricity, etc.) and between different industry segments (exploration, production, retail, etc.) are highlighted. New challenges faced by the industry, most notably environmental concerns, but also globalization and new forms of competition, are analysed with respect to the impacts that they have had and might have in the future on firms' strategies and on market performance. Prerequisite: BUEC 311.

**BUEC 464 Environmental Management**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the theory and application of environmental economics and its role in management and policy-making. The

course will cover development of a model of pollution control, evaluation of policy in this context, the setting of optimal environmental policies, and the application of these policies. Particular policies and practices implemented in North America will be examined. Prerequisites: BUEC 311 or consent of the instructor.

**BUEC 479 Government and Business in Canada**

★3 (*fi 6*) (either term, 3-0-0). The role of business in the public policy process: how business organizations influence public policy and its administration, and how public policies affect business. Processes of change are of particular interest. Attention is to the motivation, behavior patterns, and the dynamics of the interaction of different stakeholder groups, policy makers, and managers responsible for the implementation of public policies. Develops a framework for analysis of the effectiveness and efficiency of different fiscal, regulatory, and promotional policies; consideration is given to the impact of technological, economic, and social change on policy choice in the long term. Prerequisite: BUEC 311.

**BUEC 488 Selected Topics in Business Economics**

★3 (*fi 6*) (either term, 3-0-0). Normally restricted to third- and fourth-year Business students. Prerequisites: BUEC 311 or ECON 281, or consent of Department. Additional prerequisites may be required.

**BUEC 490 Business Economics Competition Part I**

★1.5 (*fi 3*) (either term, 0-1.5s-0). Preparation for Student Competition in Business Economics. Prerequisite: consent of Instructor.

**BUEC 491 Business Economics Competition Part II**

★1.5 (*fi 3*) (either term, 0-1.5s-0). Completion of Student Competition in Business Economics. Prerequisite: BUEC 490 and consent of Instructor.

**BUEC 495 Individual Research Project I**

★3 (*fi 6*) (either term, 3-0-0). Special study for advanced undergraduates. Prerequisites: consent of Instructor and Assistant Dean, Undergraduate Program.

**BUEC 496 Individual Research Project II**

★3 (*fi 6*) (either term, 3-0-0). Special Study for advanced undergraduates. Prerequisites: BUEC 495, consent of the Instructor and Assistant Dean, Undergraduate Program.

**BUEC 497 Individual Research Project III**

★3 (*fi 6*) (either term, 3-0-0). Special Study for advanced undergraduates. Prerequisites: BUEC 496, consent of the Instructor and Assistant Dean, Undergraduate Program.

**Graduate Courses****BUEC 503 Economic Foundations**

★3 (*fi 6*) (either term, 3-0-0). This course focuses on economic decision making at the level of the firm and consumer, utilizing demand and supply analysis to help understand a variety of economic and managerial issues. Formal models of managerial economic problems will be developed and used for purposes of analysis. The course will also deal with public economics, regulatory economics and introduce issues of information economics and strategic behavior. The theory of public choice and public goods will be used to analyze a variety of public economic issues. The course will also cover macroeconomic issues including: measuring macroeconomic variables, sources of economic growth, business cycles, interest rates, exchange rates, government debt, and other topics. Credit will not be given for both BUEC 502 and 503.

**BUEC 510 Macroeconomics, Public Economics and Public Policy**

★3 (*fi 6*) (either term, 3-0-0). In this course the fundamentals of macroeconomics, macroeconomic policy, public economics and the relationship to public policy will be explored. Interest rates, inflation, aggregate demand and aggregate supply will be explored, and students will understand the fundamentals of macroeconomics and macroeconomic policy. The relationship between public economics, regulation and public policy will also be developed. This course will provide a deeper understanding of economics beyond the fundamentals course. Prerequisite: BUEC 503. This course is intended for MBA students.

**BUEC 542 International Business**

★3 (*fi 6*) (either term, 3-0-0). Provides students with an introduction to the tools they will require to succeed in the increasingly international business world. Serves as a basis for other more advanced courses in International Business, covering such topics as Country Differences, International Trade, Foreign Direct Investment, Regional Economic Integration, The Foreign Exchange Market and International Business Strategy and Operations. This course will also cover selective topics in international macro economics. Prerequisite: BUEC 502 or 503. Not open to students who have taken BUEC 541.

**BUEC 563 Energy Industries and Markets**

★3 (*fi 6*) (either term, 3-0-0). This course provides a broad introduction to the energy industries and markets, focusing on market structure, firm strategy and behavior, regulation and public policy. The evolving nature of industries and markets, including technological challenges, environmental constraints and globalization, are discussed. The course includes a number of site visits and guest speakers. Prerequisite: BUEC 502 or 503. Not open to students with credit in BUEC 560.

**BUEC 564 Environmental Management**

★3 (*fi 6*) (either term, 3-0-0). The economic theory of externalities is introduced and applied in a discussion of alternative policy instruments such as taxes, tradable permits, and regulatory standards which are used to deal with pollution. Topics include current environmental regulation issues such as climate change, water and air pollution and firm strategy. Extensions include an introduction to cost-benefit analysis and environmental impact assessment tools for project evaluation as well as a discussion of the economics of non-renewable resources. Prerequisite: BUEC 502 or 503. Not open to students with credit in BUEC 562.

**BUEC 586 Selected Topics in Business Economics**

★1.5 (*fi 3*) (either term, 3-0-0). Topics in this seminar may vary from year to year and are chosen at the discretion of the Instructor.

**BUEC 610 Principles of Real Estate**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the principles of commercial real estate. Real estate markets and decision making; real estate economics and location; property development; marketing and property management; mortgage lending, real estate investment, brokerage and regulation. Industry guest speakers help link theory with industry practice in their areas of expertise. Prerequisites: BUEC 503.

**BUEC 646 The Global Business Environment**

★3 (*fi 6*) (either term, 3-0-0). Examines the changing global business environment and how it impacts international business decision-making. Covers such topics as Trends in Globalization, International Business in Canada, Managing Multinational Corporations, Importing and Exporting, International Labor Markets and the Market for Skills, International Financial Markets, Financial Crises, and Corporate Governance in Different Countries. Prerequisite: BUEC 541 or 542.

**BUEC 648 International Study Tour**

★3 (*fi 6*) (either term, 3-0-0). Combines lectures at the University of Alberta with an on-site study tour to a foreign country. The study tour component is normally for a one-to-two week period, during which students participate in company tours and lectures, to develop an appreciation for different business cultures and contexts. Students are usually expected to complete projects or case studies relating to the country under study. Check with MBA office for enrolment restrictions. Credit will not be given for both BUEC 648 and previous study tours listed as BUEC 686.

**BUEC 654 Asian Economies, Business and Management**

★3 (*fi 6*) (either term, 3-0-0). Examines the key institutional arrangements that characterize the Asian economies, business arrangements and management practices. The role of financial arrangements, labour markets, trade patterns and industrial policy in the development of the Asian economies will be analyzed. Implications for doing business in the region will be studied. Prerequisite: BUEC 503 or 512.

**BUEC 663 Natural Resources and Energy Capstone**

★3 (*fi 6*) (either term, 3-0-0). A project-focused course dealing with international market, business and policy issues and challenges in the energy, environment and natural resources sectors. A course designed around an international trip with a focus on knowledge integration and application to international markets through an intense set of visits with firms, organizations and government agencies. The specific content including the location of the trip and issues addressed changes from year to year. The course involves both teamwork and individual research. In exceptional circumstances students can complete an additional project if they are unable to complete the travel component of the course. The course is open only to students registered in the NREE specialization in the final year of the MBA program. Prerequisites: Completion of all core and NREE required courses, or permission from the program office.

**BUEC 678 Managing Business-Government Relations in Canada**

★3 (*fi 6*) (either term, 3-0-0). The role of business in the public policy process: How business organizations influence public policy and its administration, and how public policies affect business. Processes of change are of particular interest. Attention is placed on the motivation, behavior patterns, and the dynamics of the interaction of different stakeholder groups, policy makers, and managers responsible for the implementation of public policies. Develops a framework for analysis of the effectiveness and efficiency of different fiscal, regulatory, and promotional policies; consideration is given to the impact of technological, economic, and social change on policy choice in the long run. Prerequisites: BUEC 502 or 503.

**BUEC 686 Selected Topics in Business Economics**

★3 (*fi 6*) (either term, 3-0-0). Topics in this seminar may vary from year to year and are chosen at the discretion of the Instructor.

**BUEC 820 Business Economics**

★3 (*fi 32*) (either term, 3-0-0). Outlining the main schools of economic theory, macroeconomic tools and the effects of macroeconomic policy on business performance; reviewing decision-making processes of individual firms, as well as consumer behavior, price theory, marginal analysis, and forms of competition. Restricted to Executive MBA students only.

**BUEC 850 Business/Government Interface**

★1.5 (*fi 16*) (first term, 18 hours). A week-long intensive course. Understanding trends affecting business decision making; the regulatory environment; business/

government interfaces; and the management of public affairs. Restricted to Executive MBA students only.

**BUEC 860 International Business**

★3 (*fi 32*) (either term, 3-0-0). Understanding the globalization of business, international trade and trading blocks; planning for market entry and development; exporting, joint ventures, direct investment; developing the skills of an international manager. Restricted to Executive MBA students only.

## 231.71 Business Law, B LAW

Departments of Marketing, Business Economics, and Law  
Faculty of Business

**Note:** Enrolment in all B LAW courses, except B LAW 301, is restricted to students registered in the Faculty of Business, or to students registered in specified programs that require Business courses to meet degree requirements and who have obtained prior approval of their Faculty.

### Undergraduate Courses

**B LAW 301 Legal Foundations of the Canadian Economy**

★3 (*fi 6*) (either term, 3-0-0). Synoptic view of Canadian legal system, with emphasis on underlying considerations of social policy. While considering the nature, sources, philosophy, and policy objectives of the law, selected topics from the fields of tort and contract will be analyzed. Credit will be granted for only one of B LAW 301 and ENGG 420.

**B LAW 402 Business Contracts**

★3 (*fi 6*) (either term, 3-0-0). Examination of the special types of contracts that are encountered in business and commercial life. Topics include contract of sale, agency, negotiable instruments, insurance, bailment, employment contracts and contracts involving land as well as societal regulation of the freedom of contract. Prerequisite: B LAW 301 or ENGG 420.

**B LAW 403 Commercial Transactions**

★3 (*fi 6*) (either term, 3-0-0). Integrated analysis of the legal principles applying to commercial transactions, including an examination of the statutes and case law governing the sale of goods, conditional sale and chattel mortgages. Prerequisite: B LAW 301 or ENGG 420.

**B LAW 422 Law of Business Organizations**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the role of the corporation in the business and commercial life of Canada and Alberta, with emphasis on the small private company. Topics include characteristics of corporate existence, process of incorporation, forming a private company, relationship with third parties, distinction between management and ownership, duties of directors and officers, and shareholder rights. Prerequisite: B LAW 301 or ENGG 420.

**B LAW 428 Natural Resource and Environmental Law**

★3 (*fi 6*) (either term, 3-0-0). The legal framework in which managerial decisions affecting the environment are taken. Substance of environmental law and the procedures for enforcing it. Interaction of this legal approach with business strategies for dealing with environmental issues is analyzed. Prerequisite: B LAW 301 or ENGG 420.

**B LAW 432 The Legal Regulation of Business**

★3 (*fi 6*) (either term, 3-0-0). An examination of the principles of law that underlie the administrative regulation of business by governmental agencies. A representative agency from each of the three levels of government will be analysed to determine how it is created, what powers it possesses, how it uses its powers and how its powers are constrained. Prerequisite: B LAW 301 or ENGG 420.

**B LAW 442 International Business Law**

★3 (*fi 6*) (either term, 3-0-0). Study of the law regulating the conduct of international business transactions. This includes trade law (GATT, commodity agreements, economic integration, national rules); finance law (IMF, OECD, ICSID, multinationals, promotion and financing of world trade); and commercial law (payment mechanisms, international commercial contracts, UN Convention on the International Sale of Goods, settlement procedures, pertinent national and international laws). Prerequisite: Open to third-year and fourth-year students.

**B LAW 444 International Business Transactions**

★3 (*fi 6*) (either term, 3-0-0). An overview of current international business patterns and the laws surrounding such patterns, with an emphasis on what makes them different from domestic ones. A major force underlying the internationalization of the world economy has been the rapid, sustained growth of international business, both in the traditional form of international trade and in the newer forms of multinational, global and transnational business. This course is designed to provide the student with a basic understanding of the major rules governing cross-border commercial transaction in the contexts of both substantive and procedural law.

**B LAW 490 Business Law Competition Part I**

★1.5 (*fi 3*) (either term, 0-1.5s-0). Preparation for Student Competition in Business Law. Prerequisite: consent of Instructor.

**B LAW 491 Business Law Competition Part II**

★1.5 (*fi 3*) (either term, 0-1.5s-0). Completion of Student Competition in Business Law. Prerequisite: B LAW 490 and consent of Instructor.

**B LAW 495 Individual Research Project I**

★3 (*fi 6*) (either term, 3-0-0). Special study for advanced undergraduates. Prerequisites: consent of Instructor and Assistant Dean, Undergraduate Program.

**B LAW 496 Individual Research Project II**

★3 (*fi 6*) (either term, 3-0-0). Special Study for advanced undergraduates. Prerequisites: B LAW 495, consent of the Instructor and Assistant Dean, Undergraduate Program.

**B LAW 497 Individual Research Project III**

★3 (*fi 6*) (either term, 3-0-0). Special Study for advanced undergraduates. Prerequisites: B LAW 496, consent of the Instructor and Assistant Dean, Undergraduate Program.

**Graduate Courses****B LAW 628 Natural Resource and Environmental Law**

★3 (*fi 6*) (either term, 3-0-0). The course considers the legal framework in which managerial decisions affecting the environment are taken. It looks at the substances of environmental law and the procedures for enforcing it. The interaction of this legal approach with business strategies for dealing with environmental issues is analyzed.

**B LAW 642 International Business Law**

★3 (*fi 6*) (either term, 3-0-0). Deals with the international law that provides the regulatory and transactional context in which international commerce takes place. A major force underlying the internationalization of the world economy has been the rapid, sustained growth of international business, both in the traditional form of international trade and in the newer forms of multinational, global and transnational business. Provides an overview of the international economic order, including the law of the World Trade Organization, and examines the rules with respect to contractual obligations, tariffs, quantitative restrictions, subsidies, discrimination, dispute settlement, government procurement and other matters that concern international trade in both goods and services. The international regulation of direct investment, financial flows and multinationals may also be addressed.

**B LAW 658 Intellectual Property Law and Technology Commercialization**

★3 (*fi 6*) (either term, 3-0-0). An overview of key legal concepts from a variety of jurisdictions related to intellectual property and its commercialization. The course will follow a comparative case-based approach to explore formal laws, institutions and business practices related to IP in technological innovation. Topics covered may include copyright, trademark, industrial design, database protection, patent law, application process and patent searching, and licensing strategies, with a special focus on the life sciences. The course aims to provide students with the skills required to address legal issues arising from technological innovation.

**B LAW 686 Selected Topics in Business Law**

★3 (*fi 6*) (either term, 3-0-0). Topics may vary from year to year and are chosen at the discretion of the instructor.

**231.72 Canadien-français, CA FR**

Faculté Saint-Jean

**Cours de 1er cycle****CA FR 350 Panorama de la littérature canadienne-française**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Littérature canadienne-française, des origines à nos jours, vue à travers un choix d'œuvres dominantes marquant les diverses périodes de son évolution. Préalable(s): FRANC 235.

**CA FR 465 La poésie canadienne-française du XXe siècle**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). L'évolution de la poésie canadienne-française de Saint-Denis Gameau à l'époque contemporaine. Préalable(s): FRANC 235 et ★3 en littérature de niveau 300, préférablement CA FR 350.

**CA FR 466 Le théâtre canadien-français du XXe siècle**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). L'évolution du théâtre canadien-français de Gratien Gélinas à l'époque contemporaine. Préalable(s): FRANC 235 et ★3 en littérature de niveau 300, préférablement CA FR 350. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour ADRAM 466.

**CA FR 470 Le roman canadien-français du XXe siècle**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Le roman canadien-français depuis la génération de 1890 jusqu'à la naissance du nouveau roman, vu à travers les plus grands romanciers de cette période. Préalable(s): FRANC 235 et ★3 en littérature de niveau 300, préférablement CA FR 350.

**CA FR 480 Choix de sujet**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Préalable(s): FRANC 225, 235 et ★3 en littérature de niveau 300.

**CA FR 485 Ecriture au féminin dans la littérature québécoise ou canadienne d'expression française**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). L'étude de textes critiques et littéraires dans le but de cerner le concept d'écriture au féminin. Préalable(s): FRANC 235 et ★3 en littérature de niveau 300. Recommandé: CA FR 350.

**231.73 Cell Biology, CELL**

Departments of Biological Science and Cell Biology  
Faculty of Medicine and Dentistry; and Science

**Undergraduate Courses****CELL 201 Introduction to Molecular Cell Biology**

★3 (*fi 6*) (first term, 3-0-0). An introductory Cell Biology course suitable for students interested in pursuing Cell Biology specialization/honors. This course focuses on the molecular aspects of modern cell biology. Topics covered include the nucleus and gene expression; membrane structure and function; signal transduction; organelle biogenesis; cytoskeleton and cell motility; cell adhesion; the cell cycle; cancer; differentiation and stem cell technology. Reference will be made to key investigations and new technologies that have defined modern cell biology. Prerequisite: BIOL 107 or SCI 100. Pre or corequisite: CHEM 164 or 261 or SCI 100. Note: Not to be taken by students with credit in BIOL 201, in addition, not available to students currently enrolled in BIOL 201.

**CELL 300 Advanced Cell Biology I**

★3 (*fi 6*) (first term, 3-0-0). Senior course studying various topics in modern molecular cell biology emphasizing the design of experiments, the interpretation of their results and the extrapolation of their findings. Examines aspects of eukaryotic cell structure and function. Includes, but not restricted to, areas such as protein targeting and organelle biogenesis, intracellular signaling and cell-cell interactions. Makes extensive use of current literature to illustrate important concepts. Prerequisites: BIOL 201 or CELL 201 and BIOCH 200.

**CELL 301 Advanced Cell Biology II**

★3 (*fi 6*) (second term, 3-0-0). A continuation of CELL 300, covering Cell Biology topics in greater depth, and exploring recent developments in the field. Intended for, but not restricted to, students in the Cell Biology Honors and Specialization programs. Recommended prerequisite: CELL 300 or consent of Department.

**CELL 310 Evolution and Diversity of the Cell**

★3 (*fi 6*) (second term, 3-0-0). This course begins by briefly surveying eukaryotic organismal diversity with an emphasis on unicellular organisms and their biomedical/ecological impact. The course then examines the variation observed in different cellular systems including the nucleus, endomembrane system, mitochondria and plastids and how they can differ from the well studied models such as yeasts, animals and plants. Each organelle will be explored from morphological, genomic and evolutionary perspectives, making use of current literature when possible. Prerequisite: CELL 201 or BIOL 201.

**CELL 398 Research Project**

★3 (*fi 6*) (either term, 0-0-3). Directed research carried out in the laboratory of an assigned member of a department participating in the Cell Biology Program. Credit may be obtained for this course only once. Successful completion requires a written report. Open only to third year students. Prerequisites: CELL 300 and consent of the department. Students with a 300-level Biological Sciences or Biochemistry course may be considered at the discretion of the Cell Biology Undergraduate Advisor. Closed to Bear Tracks registration. Go to Department website for project information. This course can also be taken as a six week Spring/Summer session course. www.ualberta.ca/cellbiology

**CELL 402 The Birth and Death of a Cell**

★3 (*fi 6*) (second term, 3-0-0). An advanced course dealing with cell differentiation, intracellular and extracellular signaling processes, the cell cycle, apoptosis and necrosis. Consists of lecture material and small group learning sessions. Topics include stem cell research, cancer therapy and human disorders involving cell death (e.g. Alzheimer's and cardiovascular disease). Requires reading and discussion of current research articles. Prerequisites: CELL 300 or consent of Department.

**CELL 405 Cell Biology of Disease**

★3 (*fi 6*) (first term, 3-0-0). This course focuses on the nature and mechanisms of disease processes. Abnormalities in the structure and function of cells, tissues and organs that underlie disease are explored through integration of lectures with student-led discussion and presentations. Emphasis is placed on current research aimed at understanding the mechanisms of disease and disease therapy. Topics covered may include genetic disorders, cancer, cellular pathology, immunology, microbiology, parasitology and virology. Prerequisite: CELL 300 or consent of Department.

**CELL 410 Advanced Cellular Evolution**

★3 (*fi 6*) (first term, 3-0-0). This course examines current literature in the evolution of prokaryotic and eukaryotic cell biology and combines it with practical experience in molecular evolutionary techniques. The first half of the course consists of lecture material and directed reading on topics including organellar, metabolic and genomic evolution, particularly surrounding the prokaryote to eukaryote



transition. The second half involves learning comparative genomic and phylogenetic techniques from a practical perspective, culminating in student research projects. Prerequisite: CELL 310. Note: Offered in odd-numbered years.

#### **CELL 415 Developmental and Molecular Neurobiology**

★3 (*fi 6*) (first term, 0-2s-0). This course explores topics in developmental neurobiology, including cell lineage, nerve growth and guidance, myelination, synapse formation, axonal transport, and response to injury. In particular, the course emphasizes theoretical and experimental aspects, the expanding roles of molecular biology in studies in this field, and areas of present and future research. Prerequisite: consent of Department. Note: Offered in odd-numbered years.

#### **CELL 425 Systems Biology**

★3 (*fi 6*) (second term, 3-0-0). Systems biology is the molecular analysis of organisms and involves understanding the integrated and interacting network of genes, proteins and biochemical processes that give rise to what we define as life. Systems biology connects and integrates genomics, proteomics, bioinformatics, engineering, cell biology and genetics with mathematics and computational analysis to enable the comprehensive discovery of principles underlying the functioning of living organisms. This course provides the student with the fundamentals of a systems biology approach to understanding organisms. Systems biology projects using database analysis software will be a large component of this course and therefore personal computers are required. Prerequisite: CELL 201, BIOL 201 or consent of Department.

#### **CELL 445 Current Topics in Cell Biology**

★3 (*fi 6*) (first term, 3-0-0). Appraisal of current literature dealing with recent advances in selected topics in cellular and molecular biology. Intended for fourth-year students in the Cell Biology program. Information is provided in the form of selected readings of current papers, guest lecturers, and through student seminar presentations. Introduces students to current research topics in cellular and molecular biology, and enhances their appraisal and presentation of scientific material. Prerequisites: CELL 300 or consent of Department.

#### **CELL 498 Research Project**

★3 (*fi 6*) (either term, 0-0-6). Directed research carried out in the laboratory of an assigned member of a department participating in the Cell Biology Program. Credit may be obtained for this course more than once. Successful completion requires a written report. Prerequisites: A 300-level CELL, Biological Sciences, or Biochemistry course and the consent of the Cell Biology Undergraduate Advisor. Go to Department website for project information. This course can also be taken as a six week Spring/Summer session course. [www.ualberta.ca/cellbiology](http://www.ualberta.ca/cellbiology).

#### **CELL 499 Research Project**

★6 (*fi 12*) (two term, 0-0-6). Directed research carried out in the laboratory of an assigned member of a department participating in the Cell Biology Program. The project normally continues through both the Fall and Winter Terms. Successful completion of this course requires a written report and oral presentation on the research project. Prerequisite: A 300-level CELL, Biological Sciences, or Biochemistry course and the consent of the Cell Biology Undergraduate Advisor. Go to Department website for project information [www.ualberta.ca/cellbiology](http://www.ualberta.ca/cellbiology)

## Graduate Courses

#### **CELL 502 The Birth and Death of a Cell**

★3 (*fi 6*) (second term, 3-0-0). An advanced course dealing with cell differentiation, intracellular and extracellular signaling processes, the cell cycle, apoptosis and necrosis. Consists of lecture material and small group learning sessions. Topics include stem cell research, cancer therapy and human disorders involving cell death (e.g. Alzheimer's and cardiovascular disease). Will require reading and discussion of current research articles. Lectures are the same as for CELL 402 but with additional assignments and evaluation appropriate to graduate studies. May not be taken if credit has already been obtained in CELL 402. Prerequisites: Consent of the Department.

#### **CELL 505 Cell Biology of Disease**

★3 (*fi 6*) (first term, 3-0-0). This course focuses on the nature and mechanisms of disease processes. Abnormalities in the structure and function of cells, tissues and organs that underlie disease are explored through integration of lectures with student-led discussion and presentations. Emphasis is placed on current research aimed at understanding the mechanisms of disease and disease therapy. Topics covered may include genetic disorders, cancer, cellular pathology, immunology, microbiology, parasitology and virology. May not be taken if credit has already been obtained in CELL 405. Enrolment is limited and registration is by permission of the Department.

#### **CELL 510 Advanced Cellular Evolution**

★3 (*fi 6*) (first term, 3-0-0). This course examines current literature in the evolution of prokaryotic and eukaryotic cell biology and combines it with practical experience in molecular evolutionary techniques. The first half of the course consists of lecture material and directed reading on topics including organellar, metabolic and genomic evolution, particularly surrounding the prokaryote to eukaryote transition. The second half involves learning comparative genomic and phylogenetic techniques from a practical perspective, culminating in student research projects. May not be taken if credit has already been obtained in CELL 410. Registration is by permission of the Department. Note: Offered in odd-numbered years.

#### **CELL 515 Developmental and Molecular Neurobiology**

★3 (*fi 6*) (first term, 0-2s-0). This course explores nine topics in developmental neurobiology, including cell lineage, nerve growth and guidance, myelination, synapse formation, axonal transport, and response to injury. In particular, the course will emphasize theoretical and experimental aspects, the expanding roles of molecular biology in studies in this field, and areas of present and future research. Lectures are the same as for CELL 415 but with additional assignments and evaluation appropriate to graduate studies. This course may not be taken if credit has already been obtained in CELL 415. Prerequisite: consent of Department. Note: Offered in odd-numbered years.

#### **CELL 525 Systems Biology**

★3 (*fi 6*) (second term, 3-0-0). Systems biology is the molecular analysis of organisms and involves understanding the integrated and interacting network of genes, proteins and biochemical processes that give rise to what we define as life. Systems biology connects and integrates genomics, proteomics, bioinformatics, engineering, cell biology and genetics with mathematics and computational analysis to enable the comprehensive discovery of principles underlying the functioning of living organisms. This course provides the student with the fundamentals of a systems biology approach to understanding organisms. Systems biology projects using database analysis software will be a large component of this course and therefore personal computers are required. May not be taken if credit has already been obtained in CELL 425. Enrolment is limited and registration is by permission of the Department.

#### **CELL 545 Current Topics in Cell Biology**

★3 (*fi 6*) (first term, 3-0-0). Appraisal of current literature dealing with recent advances in selected topics in cellular and molecular biology. Intended for graduate students in the MSc program. Information is provided in the form of selected readings or current papers, guest lecturers and through student presentations. Introduces students to current research topics in cellular and molecular biology and enhances their appraisal and presentation of scientific material. Lectures are the same as for CELL 445 but with additional assignments and evaluation appropriate to graduate studies. This course may not be taken for credit if credit has already been obtained in CELL 445. Prerequisite: consent of Instructor.

#### **CELL 614 Molecular Mechanisms of Cellular Regulation**

★3 (*fi 6*) (first term, 0-4s-0). Current appraisal of scientific literature in selected areas of molecular and cellular biology. Information is provided in the form of selected readings of current papers, and through student seminar presentations. The overall goal is to introduce students to current research topics in molecular and cellular biology, and to enhance their abilities in the appraisal and presentation of scientific material. Enrolment is limited to twelve students, early registration is recommended. Permission to register is required from the instructor.

#### **CELL 621 The Art of Grant Writing**

★3 (*fi 6*) (second term, 3-0-0). The purpose of this course is to train graduate students in preparing grant applications in order to improve their chances of future success in obtaining research funds from a major Canadian federal funding agency such as the Canadian Institutes of Health Research. The course is targeted primarily towards students who have completed at least one year of graduate work. Preference will be given to those planning to pursue a PhD. Throughout the course, students will be instructed on how to prepare a complete grant application package on a topic that is different from their graduate project. The proposal will be prepared in stages and completed two weeks prior to the end of the semester. Students will then prepare and give presentations for a mock site visit by the funding agency. Students will also participate in a mock peer review committee and make final funding decisions. Enrolment is limited, and registration is by permission of the Department.

#### **CELL 671 Recent Advances in Cell Biology**

★2 (*fi 4*) (two term, 0-1s-0). A seminar course on topics of current interest in Cell Biology. Students will attend seminars and contribute a journal club presentation based on recent developments published in first rate journals. Note: Open only to Graduate students in Cell Biology.

#### **CELL 672 Recent Advances in Cell Biology**

★2 (*fi 4*) (two term, 0-1s-0). A seminar course on topics of current interest in Cell Biology. Students will attend seminars and contribute a presentation on their research project that includes original data. Prerequisite: CELL 671 or consent of the Department. Note: Open only to Graduate students in Cell Biology.

## 231.74 Chemical and Materials Engineering, CME

Department of Chemical and Materials Engineering  
Faculty of Engineering

### Undergraduate Courses

#### **CME 200 Introduction to Chemical and Materials Engineering**

★0.5 (*fi 1*) (first term, 1 day). Topics of interest to second year Chemical and Materials Engineering students, with special reference to industries in Alberta,

including coverage of elements of ethics, equity, concepts of sustainable development and environmental stewardship, public and worker safety and health considerations including the context of the Alberta Occupational Health and Safety Act. Offered in a single day during the first week of September. Restricted to students registered in the Department of Chemical and Materials Engineering.

#### CME 265 Process Analysis

★4.5 (fi 6) (either term, 3-0-3). Basic process principles; material and energy balances, transient processes, introduction to computer-aided balance calculations. Prerequisites: ENCMP 100, MATH 102 and CHEM 105. Corequisites: CH E 243 and MATH 209 or equivalent. Credit may not be obtained in this course if previous credit has been obtained for CH E 265.

#### CME 421 Mineral Processing

★3.8 (fi 6) (first term, 3-0-3/2). Unit operations employed to concentrate minerals including comminution, classification, gravity concentration, froth flotation, thickening, filtering; tailings disposal; marketing of minerals; economics. Credit may not be obtained in this course if previous credit has been obtained in MAT E 331. Prerequisite: STAT 235 or consent of Instructor.

#### CME 422 Interfacial Engineering in Mineral Processing

★3.5 (fi 6) (either term, 3-1s-0). An introduction to the principles of colloid and interface chemistry, with specific reference to the problems of fine and ultrafine particle processing, and techniques that have been developed in coal, oil sands, base metal and precious metal ore processing. Prerequisites: CME 421 and (CH E 343 or MAT E 301 or MAT E 340).

#### CME 472 Extractive Metallurgy

★3.5 (fi 6) (either term, 3-1s-0). Physical and chemical preparation of ore feed. Roasting, briquetting, sintering and pelletizing. Leaching processes and chemicals, kinetics of leaching, ion exchange, activated carbon adsorption, solvent extraction and McCabe-Thiele Diagram. Metal recovery from solutions, electrowinning and electrorefining. Furnaces and fuels, refractories, slags and mattes. Reduction of metal compounds, smelting and converting, pyrometallurgical metal refining. Credit may not be obtained in this course if previous credits have been obtained in MAT E 430 and MAT E 332. Prerequisites: CME 265, MAT E 341, or consent of the Department.

#### CME 481 Colloquium I

★1 (fi 2) (either term or Spring/Summer, 1-0-0). Oral presentations. Graded on a pass/fail basis. Prerequisite: 85 units completed or consent of Instructor. Credit may not be obtained in this course if previous credit has been obtained for CH E 481.

#### CME 482 Fundamentals of Polymers

★3.5 (fi 6) (first term, 3-1s-0). Polymerization, molecular weight distribution, molecular weight measurement techniques, isomerism and conformation, rubber elasticity, glass transition, amorphous and crystalline states, crystallization and melting, tensile property, polymer melts and rheology, polymer solutions and blends. May include a tour to a local polymer manufacturer. Prerequisites: STAT 235, CH E 312 and (CH E 343 or MAT E 301 or MAT E 340).

#### CME 483 Colloquium II

★1 (fi 2) (second term, 1-0-0). Oral presentation of technical material. Graded on a pass/fail basis. Prerequisite: CME 481. Credit may not be obtained in this course if previous credit has been obtained for CH E 483.

#### CME 484 Polymer Processing

★3.5 (fi 6) (either term, 3-0-0). Non-Newtonian fluids, viscoelastic properties and models, diffusion and mass transfer, mixing, extrusion, molding and forming. Prerequisite: CME 482.

#### CME 485 Polymerization Reactions

★3.5 (fi 6) (either term, 3-0-0). Step growth polymerization, Carothers equation, free radical chain polymerization, auto-acceleration, copolymerization, monomer reactivity ratios, ionic and coordination polymerizations, catalysts, living polymerization, kinetics, molecular weight distribution, dispersion and emulsion polymerizations, polymer reactor design and control. Prerequisites: CHEM 261, CH E 345 and CME 482.

## Graduate Courses

#### CME 900 Directed Research

★3 (fi 6) (variable, unassigned). An engineering project for students registered in a Master of Engineering program.

## 231.75 Chemical Engineering, CH E

Department of Chemical and Materials Engineering  
Faculty of Engineering

The following courses were renumbered effective 2001-2002

Old	New	Old	New
CH E 316	CH E 416	CH E 434	CH E 345
CH E 365	CH E 464	CH E 436	CH E 583
CH E 390	CH E 484	CH E 502	CH E 482
CH E 418	CH E 318		

The following courses were renumbered effective 2005-06

Old	New	Old	New
CH E 200	CME 200	CH E 683	CME 681
CH E 265	CME 265	CH E 684	CME 682
CH E 481	CME 481	CH E 685	CME 683
CH E 483	CME 483	CH E 686	CME 684

## Undergraduate Courses

**Note:** The Chemical Engineering Department offers a regular academic term from May-August. Courses designated as "Spring/Summer" in this section of the Calendar are part of this academic term and normally run for the full May-August period.

#### CH E 243 Engineering Thermodynamics

★3.5 (fi 6) (either term or Spring/Summer, 3-1s-0). An introduction to the first and second laws of thermodynamics. Prerequisites: MATH 101.

#### CH E 312 Fluid Mechanics

★3.5 (fi 6) (either term, 3-1s-0). Newtonian and non-Newtonian fluid behavior; hydrostatics; buoyancy, application of Bernoulli and momentum equations; frictional losses through pipes, ducts, and fittings; pipe networks; pumps; drag on submerged bodies and flow through porous media. Prerequisites: CH E 243 EN PH 131 and MATH 209. Corequisite: MATH 201.

#### CH E 314 Heat Transfer

★3.5 (fi 6) (either term or Spring/Summer, 3-1s-0). Principles of conduction, convection and radiation heat transfer. Design and performance analysis of thermal systems based on these principles. Prerequisites: MATH 201, CH E 312. Corequisite CH E 374.

#### CH E 318 Mass Transfer

★4 (fi 6) (either term or Spring/Summer, 3-0-2). Molecular and turbulent diffusion; mass transfer coefficients; mass transfer equipment design including absorption and cooling towers, adsorption and ion exchange. Prerequisites: CME 265, CH E 312 and 343. Corequisite: CH E 314. Credit may not be obtained in this course if previous credit has been obtained for CH E 418.

#### CH E 343 Chemical Engineering Thermodynamics

★3.5 (fi 6) (either term, 3-1s-0). Thermodynamics of non-ideal gases and liquids; vapour-liquid equilibrium, thermodynamics of chemical processes and multicomponent systems. Prerequisite: CH E 243. Corequisite: CME 265.

#### CH E 345 Chemical Reactor Analysis I

★3.5 (fi 6) (either term or Spring/Summer, 3-1s-0). Kinetics of chemical reactions and design of ideal chemical reactors. Prerequisites: CME 265, CH E 343 and 374. Credit may not be obtained in this course if previous credit has been obtained for CH E 434.

#### CH E 351 Chemical Engineering Laboratory

★3.5 (fi 6) (either term, 2-0-3). Technical report writing; thermodynamics, material, and energy balances, and calibration experiments. Prerequisites: ENGL 199 or equivalent, CME 265 and CH E 243. Corequisite: CH E 312.

#### CH E 358 Process Data Analysis

★5 (fi 6) (either term or Spring/Summer, 3-0-4). Statistical analysis of process data from chemical process plants and course laboratory experiments. Topics covered include least squares regression, analysis of variance, propagation of error, and design of experiments. Prerequisites: CH E 351 and STAT 235. Corequisites: CH E 314 and 345.

#### CH E 374 Computational Methods in Engineering

★3.5 (fi 6) (either term, 3-1s-0). Formulation and solution of chemical and materials engineering problems; solution of systems of linear and nonlinear algebraic equations; numerical interpolation, differentiation and integration; numerical solution of ordinary and partial differential equations. Prerequisites: ENCMP 100 (or equivalent), MATH 102, 201 and 209. Credit cannot be obtained in this course if credit has already been obtained CH E 474 or MATE 390.

#### CH E 416 Equilibrium Stage Processes

★4 (fi 6) (either term, 3-0-2). Design of separation processes with emphasis on the equilibrium stage concept, distillation, absorption and extraction. Prerequisites: CH E 343, 314 and 318. Credit may not be obtained in this course if previous credit has been obtained for CH E 316.

#### CH E 420 Mixing in the Process Industries

★3.5 (fi 6) (either term, 3-1s-0). Design and operation of mixing equipment in the process industries. Process results ranging from blending, solids suspension, and gas dispersion to reactor design and heat transfer will be covered. Emphasis is on application of the fundamentals of chemical engineering. Laminar and turbulent regimes, stirred tanks and static mixers, and other specialized applications will be discussed. Credit cannot be obtained in this course if credit has already been obtained in CH E 520. Corequisite: CH E 464.

#### CH E 435 Oilsands Engineering Design

★6 (fi 6) (second term, 4-0-4). Integration of chemical engineering practice, theory and economics into the design and evaluation of proposed capital projects in the oilsands industry. Prerequisites: CH E 416, 445 and 464. Registration restricted to students in the Oilsands Engineering Option.

**CH E 445 Chemical Reactor Analysis II**

★3.5 (fi 6) (either term, 3-1s-0). Analysis and design of non-ideal chemical reactors for industrial product synthesis. Prerequisites: CH E 314, 318 and 345.

**CH E 446 Process Dynamics and Control**

★4 (fi 6) (either term or Spring/Summer, 3-1s-3/3). Introduction to process modeling and transient response analysis; design and analysis of feedback systems; stability analysis; process control applications; process control using digital computers. Prerequisites: MATH 201 and 209. Corequisite: CH E 312.

**CH E 448 Process Control for Mechanical Engineers**

★4 (fi 6) (second term, 3-1s-3/3). Introduction to systems modeling and transient response analysis with an emphasis on mechanical engineering applications; design and analysis of feedback systems; stability analysis; feedforward control; process control applications. Prerequisites: MATH 201 or equivalent, MATH 209, and MEC E 330. Corequisite: MEC E 370. Restricted to students registered in the Mechanical Engineering program. Credit may not be obtained in this course if previous credit has been obtained for CH E 446.

**CH E 454 Chemical Engineering Project Laboratory**

★3 (fi 6) (second term, 1-0-4). Experiments in kinetics and mass transfer. Prerequisites: CH E 318, 345, 358, and 416.

**CH E 458 Special Projects in Chemical Engineering**

★3.5 (fi 6) (either term or Spring/Summer, 2-0-3). Projects in Chemical Engineering. This course is open only to students with a GPA of 3.0 or greater during the previous two academic terms. Prerequisite: consent of Department.

**CH E 459 Special Projects in Chemical Engineering II**

★3.5 (fi 6) (either term, 2-0-3). Projects in Chemical Engineering. This course is open only to students with a GPA of 3.0 or greater during the previous two academic terms. Prerequisite: CH E 458.

**CH E 464 Chemical Engineering Design I**

★4.5 (fi 6) (either term or Spring/Summer, 3-0-3). Engineering design concepts; cost estimation; project planning and scheduling; plant safety and hazards analysis; selected project design examples. Prerequisites: CH E 314, 345, and ENG M 310 or 401. Corequisite: CH E 416. Credit may not be obtained in this course if previous credit has been obtained for CH E 365.

**CH E 465 Chemical Engineering Design II**

★6 (fi 6) (second term, 4-0-4). Integration of chemical engineering practice, theory and economics into the design and evaluation of proposed capital projects. Prerequisites: CH E 345, 416 and 464.

**CH E 482 Environmental Impact of the Process Industries**

★3.5 (fi 6) (either term or Spring/Summer, 3-1s-0). Industrial emissions, pollution control, and waste minimization. Special processes, design techniques and operating procedures related to environmental and ecological considerations. Corequisite: CH E 416. Credit may not be obtained in this course if previous credit has been obtained for CH E 502.

**CH E 484 Introduction to Biochemical Engineering**

★3.5 (fi 6) (either term, 3-0-1). Physical and chemical properties of cells, tissues, and biological fluids, engineering analysis or processes such as cell growth and fermentation, purification of products. Prerequisites: CME 265 or BIOL 107. Credit may not be obtained in this course if previous credit has been obtained for CH E 390.

**CH E 485 Fuel Cells and Their Applications**

★3 (fi 6) (either term, 3-0-0). Introduction to principles of operation of fuel cells and their applications; historical and environmental perspectives; elementary electrochemistry, types of fuel cell - fuels, membranes and liquid ion conductors, operating conditions; factors affecting performance; applications as standing engines and mobile power sources. Limited to 3rd/4th year undergraduate students in engineering. Prerequisites: CH E 343, MAT E 202 or equivalent and MATH 201 or consent of Instructor.

**CH E 486 Microbial Processes in Engineering**

★3 (fi 6) (either term, 3-1s-0). Review of fundamental bioprocesses including global nutrient cycling. Application of bioprocess knowledge to problem resolution under various thermodynamic conditions in areas such as water and pasture management and production of foods and drugs.

**CH E 487 Heterogeneous Catalysts**

★3.5 (fi 6) (either term, 3-1s-0). The preparation, characterization and use of heterogeneous catalysts with emphasis on the effects of catalyst nano-structure on catalytic activity, selectivity and stability. Prerequisites: MAT E 211 and CH E 345.

**CH E 512 Introduction to Fluid-Particle Systems**

★3.5 (fi 6) (either term or Spring/Summer, 3-1s-0). Unit operations studied in this course include: settlers, thickeners, centrifuges, slurry pipelines and flotation columns. Course topics will also include: one dimensional homogeneous and multiphase flows, sedimentation and fluidization of multi-species systems, and drift flux theory. Prerequisite: CH E 312.

**CH E 522 Fundamentals of Oil Sands Upgrading**

★4 (fi 6) (either term or Spring/Summer, 3-1s-3/3). Introduction to the physical,

chemical and engineering principles required for the design and operation of plants used for the upgrading of heavy oils and bitumens. Prerequisite or corequisite: CH E 343.

**CH E 534 Fundamentals of Oilsands Extraction**

★4 (fi 6) (either term, 3-1s-3/3). Application of fluid mechanics, interfacial phenomena and colloid science to bitumen extraction. Prerequisites: CH E 312 and 314.

**CH E 572 Modelling Process Dynamics**

★4 (fi 6) (second term, 3-1s-3/3). Mechanistic and empirical modeling of process dynamics; continuous- and discrete-time models; model fitting and regression analysis. Corequisites: CH E 314, 318 and 345.

**CH E 573 Digital Signal Processing for Chemical Engineers**

★3.8 (fi 6) (second term, 3-0-3/2). Time and frequency domain representation of signals; Fourier Transform; spectral analysis of data; analysis of multivariate data; treatment of outliers and missing values in industrial data; filter design. Prerequisites: CH E 358 and 446.

**CH E 576 Intermediate Process Control**

★3.8 (fi 6) (second term, 3-0-3/2). Digital and multivariable process control techniques; discrete-time analysis of dynamic systems; digital feedback control; Kalman filter and linear quadratic optimal control; model predictive control. Prerequisite: CH E 446 or equivalent.

**CH E 580 Introduction to Pulp and Paper Engineering**

★3.5 (fi 6) (either term, 3-1s-0). Fiber resources for papermaking; sustainable forest management; wood yard operations; chemical pulping; mechanical pulping; pulp processing; paper making; pulp and paper testing; re-circulation and fate of chemicals; and mill management. Prerequisite: CH E 314 or consent of Instructor.

**CH E 582 Introduction to Biomaterials**

★3.5 (fi 6) (either term, 3-1s-0). Survey of materials intended for biological applications; biomaterials-related biological phenomena (protein adsorption, blood coagulation and cell adhesion); biomaterials for engineering of blood vessel, bone and skin tissues. Two fundamental engineering philosophies will be stressed: structure-function relationship and purposeful manipulation for a desired outcome. Prerequisite: BIOL 107 or BME 210 or CH E 484 or consent of Instructor.

**CH E 583 Surfaces and Colloids**

★3.5 (fi 6) (either term or Spring/Summer, 3-1s-0). Interactions between fluid phases and solids; micelles; electrokinetic phenomena; adsorption isotherms; applications to industrial processes. Prerequisite: CH E 343. Credit cannot be obtained in this course if previous credit has been obtained for CH E 436.

**CH E 584 Molecular Sieve Technology**

★3.5 (fi 6) (either term, 3-1s-0). Structures and properties of molecular sieves and related materials. Applications of molecular sieves in separation processes based on molecular size differences as well as thermodynamic interactions between active surfaces and adsorbates. Molecular sieves in purification processes based on cationic exchange reactions and selective adsorption. Molecular sieves as catalysts. Prerequisites: CHEM 105 and CH E 243.

**CH E 594 Advanced Topics in Chemical Engineering**

★3.5 (fi 6) (either term or Spring/Summer, 3-1s-0). An advanced treatment of selected chemical engineering topics of current interest to staff and students.

**CH E 596 Advanced Topics in Process Dynamics and Control**

★3.5 (fi 6) (either term or Spring/Summer, 3-1s-0). An advanced treatment of selected topics in process dynamics and control.

**Graduate Courses**

**Note:** All 500-level courses may be taken for graduate credit subject to the approval of the student's supervisory committee and departmental restrictions on the number of such courses that a student's program may contain.

**CH E 610 Computational Transport Phenomena**

★3 (fi 6) (either term, 3-0-0). Solutions of the transport equations of momentum, mass and energy. Transport processes are reviewed but emphasis is placed on the numerical solution of the governing differential equations. Different solution methodologies and software are presented.

**CH E 611 Advanced Transport Phenomena**

★3 (fi 6) (either term, 3-0-0). Transport expressions for physical properties are combined with conservation laws to yield generalized equations used to solve a variety of engineering problems in fluid mechanics, and heat and mass transfer; steady-state and transient cases; special topics in non-Newtonian flow and forced diffusion.

**CH E 612 Advanced Fluid Mechanics**

★3 (fi 6) (either term, 3-0-0). Potential, boundary layer, viscometrics, and secondary flows; application to multiphase phenomena.

**CH E 613 Selected Topics in Mass Transfer**

★3 (fi 6) (second term, 3-0-0). A study of fundamental mass transfer with emphasis on gas-liquid and liquid-liquid systems.



**CH E 614 Fluid-Particle Systems and Applications**

★3 (fi 6) (either term, 3-0-0). Fundamental physical laws governing the behaviour of fluidparticle systems. Particle agglomeration and non-Newtonian pipeline flows; flow through porous media; particle settling; multiparticle drag relationships; particle interactions in dense, coarse particle slurry flows; flowing granular solids. Application of the physical laws in paste or thickened tailings pipelining; horizontal oil well production; oil sand hydrotransport; and bulk solids handling.

**CH E 615 Advanced Separation Processes**

★3 (fi 6) (either term, 3-0-0). Characterization, selection and design of equilibrium and rate-governed separation processes. Topics include capacity and efficiency of mass transfer equipment and process energy requirements.

**CH E 617 Colloids and Interfaces**

★3 (fi 6) (either term, 3-0-0). Emphasis is on the basics of colloid and interfacial phenomena. Aimed at upper level and graduate students in chemical and mineral engineering, chemistry and geochemistry with an interest in application to the energy sector, mineral processing, materials handling, and chemical industry.

**CH E 620 Mixing in the Process Industries**

★3.5 (fi 6) (either term, 3-1s-0). Design and operation of mixing equipment in the process industries. Process results ranging from blending, solids suspension, and gas dispersion to reactor design and heat transfer will be covered. Laminar and turbulent regimes, stirred tanks and static mixers, and other specialized applications will be discussed. The course integrates fundamental chemical engineering concepts with equipment design, mixing theory, and turbulence theory. Credit cannot be obtained in this course if credit was previously obtained in CH E 420 or CH E 520.

**CH E 624 Advanced Thermodynamics**

★3 (fi 6) (first term, 3-0-0). Principles of thermodynamics; properties of homogeneous fluid phases; phase and chemical equilibria; application to industrial problems.

**CH E 625 Advanced Macroscopic and Statistical Thermodynamics**

★3 (fi 6) (either term, 3-0-0). Advanced topics in macroscopic thermodynamics and fundamentals of statistical thermodynamics. Thermodynamics of composite systems including surface thermodynamics and thermodynamics in fields. Introduction to quantum mechanics. Principles of statistical thermodynamics. Construction of partition functions and calculations of basic thermodynamic properties for several fundamental systems. Applications will include properties of ideal gases, ideal solids and adsorbed gases.

**CH E 632 Polymer Melt Processing**

★3 (fi 6) (either term, 3-0-0). Fluid mechanical fundamentals of melt processing operations. Extrusion, fibre spinning, calendaring, moulding. Incorporation of continuum rheological models into equations of motion to predict behavior of engineering relevance. Description of anomalies arising from melt elasticity and methods of mitigating these.

**CH E 634 Advanced Chemical Reactor Design**

★3 (fi 6) (either term, 3-0-0). Design of homogeneous and heterogeneous reactors for isothermal and non-isothermal operation; analysis of rate data; transport processes in heterogeneous catalytic systems.

**CH E 645 Heterogeneous Catalysis and Reactor Analysis**

★3 (fi 6) (either term, 3-0-0). Principles of heterogeneous catalysis and reactor analysis with emphasis on industrial catalytic reactions; characterization of heterogeneous catalysts.

**CH E 655 Advanced Biomaterials Science**

★3 (fi 6) (either term, 3-0-0). Intended for graduate students who are familiar with basic biomaterials science. Focuses on: molecular design of biomaterial and biomaterial surfaces in order to modulate specific biological events; techniques to modulate biomaterial properties; assessment techniques for modifications. The biological events will be studied at the cellular and molecular level.

**CH E 662 Process Identification**

★3.8 (fi 6) (either term, 3-0-3/2). Selected topics related to empirical modelling of process systems are undertaken. Emphasis on time-series based modelling theory and techniques, (e.g., nonparametric, parametric, spectrum analysis, nonlinear, and closed-loop identification methods), model validation, experimental design, and applications in forecasting, analysis, and control.

**CH E 674 Numerical Solutions of Engineering Problems**

★3 (fi 6) (second term, 3-0-0). Numerical solutions of engineering problems using linear and nonlinear sets of equations, ordinary and partial differential equations.

**CH E 675 Stochastic Dynamic Optimization**

★3 (fi 6) (either term, 3-0-0). Robust optimization; introduction to stochastic programming; Markov decision making process; stochastic dynamic programming for sequential decision making problems under uncertainty; linear quadratic control.

**CH E 676 Model Predictive Control**

★3 (fi 6) (either term, 3-0-0). Model predictive control; constrained optimization; state estimation; nonlinear optimization; linear quadratic control.

**CH E 689 Polymer Properties**

★3 (fi 6) (either term, 3-0-0). Polymerization, molar mass distributions, polymer analytical

techniques, solution and blend thermodynamics, physical and chemical properties of polymers, lattice models, rubber thermodynamics, polymer processing, fluid flow and heat transfer in melt processing, special polymer project. Prerequisite: consent of Instructor. Not open to students with credit in MAT E 467 or CH E 539.

**CH E 694 Advanced Topics in Chemical Engineering**

★3 (fi 6) (either term, 3-0-0). An advanced treatment of selected chemical engineering topics of current interest to staff and students.

**CH E 696 Special Topics in Process Dynamics and Control**

★3 (fi 6) (either term, 3-0-0). Advanced treatment of selected topics in process dynamics and/or computer process control of current interest to staff and students.

**CH E 900 Directed Research Project**

★3 (fi 6) (variable, unassigned).

## 231.76 Chemistry, CHEM

Department of Chemistry  
Faculty of Science

### Undergraduate Courses

**CHEM 101 Introductory University Chemistry I**

★3 (fi 6) (either term, 3-1s-3). Atoms and molecules, states of matter, chemistry of the elements. Prerequisite: Chemistry 30, or equivalent.

**CHEM 102 Introductory University Chemistry II**

★3 (fi 6) (either term, 3-1s-3). Rates of reactions, thermodynamics and equilibrium, electro-chemistry, modern applications of chemistry. Prerequisite: CHEM 101.

**CHEM 103 Introductory University Chemistry I**

★4.3 (fi 6) (either term, 3-1s-3/2). Atoms and molecules, states of matter, chemistry of the elements. Prerequisite: Chemistry 30, or equivalent. Note: Restricted to Engineering students only. Other students who take this course will receive ★3.0.

**CHEM 105 Introductory University Chemistry II**

★3.8 (fi 6) (either term, 3-0-3/2). Rates of reactions, thermodynamics and equilibrium, electrochemistry, modern applications of chemistry. Prerequisite: CHEM 103. Note: Restricted to Engineering students only. Other students who take this course will receive ★3.0.

**CHEM 164 Organic Chemistry I**

★3 (fi 6) (first term, 3-0-3). The study of basic molecular structure and reactivity of organic compounds based on their functional groups. Introduction to nomenclature, three dimensional structure, physical properties, and reactivity of compounds of carbon. Functional groups covered will emphasize alkanes, alkenes, alkynes, alkyl halides, alcohols, and some aromatics. Examples will include hydrocarbons (petroleum products), halogenated organic compounds (e.g., pesticides), and polymers of industrial importance which may be found in everyday life. Note: Students who already have credit in CHEM 101 must register in CHEM 261. Prerequisite: Chemistry 30 or equivalent. Restricted to students with CHEM 30 averages of 90% or higher, or departmental approval.

**CHEM 211 Quantitative Analysis I**

★3 (fi 6) (first term, 3-0-4). Principles, methods, and experimental applications emphasizing solution phase equilibria, titrimetry, volumetric laboratory skills, and evaluation of experimental data. Includes examples of organic and inorganic analysis. Prerequisite: CHEM 102 or SCI 100.

**CHEM 213 Quantitative Analysis II**

★3 (fi 6) (second term, 3-0-4). A continuation of CHEM 211 emphasizing the principles, methods, and experimental applications of separation techniques, atomic and molecular spectrometry, electrochemistry, and evaluation of experimental data. Includes examples of organic and inorganic analysis and use of the analytical literature. Prerequisite: CHEM 211. Students who have previously taken CHEM 313 may not take CHEM 213 for credit.

**CHEM 241 Introduction to Inorganic Chemistry**

★3 (fi 6) (first term, 3-0-3). The chemistry of main-group elements including a survey of the structure, bonding, and reactivity of their compounds. Transition-metal chemistry will be introduced. The course will include applications in industrial, biochemical, environmental, and materials science. Students who have obtained credit for CHEM 331 cannot take CHEM 241 for credit. Prerequisites: CHEM 102 or 105 and CHEM 161 or 164 or 261; or SCI 100.

**CHEM 243 Advanced Inorganic Chemistry**

★3 (fi 6) (second term, 3-0-3). An extension of CHEM 241 with emphasis on the bonding, structure, and reactivity of transition-metal elements. The course will include applications in industrial, biochemical, environmental, and materials science. For Chemistry Honors and Specialization students only, except by consent of Department. Note: This course may not be taken for credit if credit has already been received in CHEM 341. Prerequisites: CHEM 241 or consent of Department.

**CHEM 261 Organic Chemistry I**

★3 (fi 6) (second term, 3-0-3). The correlation of structure and chemical bonding in carbon compounds with the physical properties and chemical reactivity of organic molecules. Discussion will be based on functional groups with emphasis on hydrocarbons and derivatives that contain halogens, oxygen, sulfur, and the hydroxy group. Introduction to stereochemistry, three dimensional structure, reaction mechanisms, especially addition to double bonds, nucleophilic substitution and elimination reactions. Prerequisite: CHEM 101 or 103. Note: Students who have obtained credit for CHEM 161 or 164 cannot take CHEM 261 for credit. Engineering students who take this course will receive ★4.5.

**CHEM 263 Organic Chemistry II**

★3 (fi 6) (either term, 3-0-3). Continuation of the structural and chemical properties of the basic functional groups of organic compounds including alkynes, aromatic compounds, aldehydes, ketones, carboxylic acids and their derivatives and amines. Illustration of these functional groups in natural products such as carbohydrates, amino acids and proteins, nucleic acids and lipids. Discussion of the application of spectroscopic methods for the structure determination in simple organic molecules. Prerequisites: CHEM 161 or 164 or 261 or SCI 100. Note: Students who have obtained credit for CHEM 163 cannot take CHEM 263 for credit.

**CHEM 282 Atomic and Molecular Structure**

★3 (fi 6) (second term, 3-0-4). An introduction to the quantum view of nature with applications to atomic and molecular structure. Methods to describe the quantum world are introduced, used to describe simple electronic, vibrational and rotational structure of model systems, and applied to the hydrogen atom, many-electron atoms, simple diatomic molecules, and the electronic structure of polyatomic molecules. The laboratory portion of the course consists of practical applications enriching and illustrating the lecture material, and incorporates the use of computers as a routine aid to processing experimental results. Prerequisites: CHEM 102 or 105; one 200-level CHEM course; MATH 115 and PHYS 124 or 144. Corequisite: PHYS 146 if PHYS 144 presented as a prerequisite instead of PHYS 124. Students with SCI 100 have prerequisite requirements.

**CHEM 298 Introductory Spectroscopy**

★3 (fi 6) (either term, 3-0-3). The course is an integrated introduction to the qualitative and instrumentation aspects of spectroscopy and its applications in chemistry. The subjects will include: absorption, emission, vibrational and rotational spectroscopy of atoms and molecules; and nuclear magnetic resonance spectroscopy. For Chemistry Honors and Specialization students only, except by consent of Department. Prerequisite: CHEM 102 or 105 or SCI 100; CHEM 163 or 263.

**CHEM 299 Research Opportunity Program in Chemistry**

★1.5 (fi 3) (either term, 0-0-3). A credit/no-credit course for supervised participation in a faculty research project. Normally taken after completion of a minimum of ★30 but not more than ★60 in a program in the Faculty of Science. Prerequisite: GPA of 2.5 or higher, CHEM 101 or 161 or SCI 100; and consent of Department. Specific projects may require additional prerequisites. Project and course information available at ROP website or Department of Chemistry. Prospective enrollees in CHEM 299 must apply to Department of Chemistry. Application does not guarantee an ROP position. Credit for this course may be obtained twice.

**CHEM 303 Environmental Chemistry I**

★3 (fi 6) (first term, 3-0-0). The chemistry of environmental processes. Atmospheric chemistry; thermal and photochemical reactions of atmospheric gases including oxygen, ozone, hydroxy radical, and oxides of nitrogen and sulfur. Aquatic chemistry; characterization, reactions, and equilibria of dissolved species, water purification treatments. Metals and organohalides in the environment. Risk assessment. Prerequisites: CHEM 102 or SCI 100; CHEM 164 or 261; CHEM 263; and one 200-level CHEM course or CH E 243.

**CHEM 305 Environmental Chemistry II**

★3 (fi 6) (second term, 3-0-4). The lecture and laboratory portions of this course will highlight adsorption from aqueous solutions, convective/diffusive transport, vapour/solution equilibria, coagulation of colloids, sedimentation, ion exchange, computer modeling of complex systems, trace analysis of pesticides, chemical treatment of hazardous wastes. Quantitative calculations will be emphasized. The lecture component will provide theoretical background for experiments and instrumentation used for chemical measurements. Prerequisites: CHEM 263; CHEM 213 or 298 or 313; CHEM 303 or 373. Note: Restricted to students in the Environmental Physical Sciences and Chemistry (Honors, Specialization, and General Science with concentration in Chemistry) programs.

**CHEM 313 Instrumentation in Chemical Analysis**

★3 (fi 6) (first term, 3-0-4). Instrumentation and analytical applications of spectroscopic, chromatographic and electroanalytical methods are discussed and applied in the laboratory. Prerequisites: CHEM 211; ★6 in junior Physics. SCI 100 may be used in lieu of ★6 in junior Physics.

**CHEM 333 Inorganic Materials Chemistry**

★3 (fi 6) (either term, 3-0-3). Fundamentals of the synthesis, structure and properties of inorganic solids, thin films, and nanoscale materials, to be complemented with case studies of modern applications of inorganic materials; selected topics such as catalysis, molecular and nanoparticle-based computing, telecommunications,

alternative energies, superconductivity, biomedical technologies, and information storage will be discussed. Techniques for characterization and analysis of materials on the nano and atomic level will be introduced. Prerequisite: CHEM 241.

**CHEM 361 Organic Chemistry**

★3 (fi 6) (first term, 3-0-4). Mechanisms and reactions of aromatic and aliphatic compounds. Prerequisites: CHEM 102 or SCI 100; CHEM 163 or 263.

**CHEM 363 Organic Chemistry**

★3 (fi 6) (second term, 3-0-4). A continuation of CHEM 361. Prerequisite: CHEM 361.

**CHEM 371 Energetics of Chemical Reactions**

★3 (fi 6) (first term, 3-0-3). A study of the implications of the laws of thermodynamics for transformations of matter including phase changes, chemical reactions, and biological processes. Topics include: thermochemistry; entropy change and spontaneity of processes; activity and chemical potential; chemical and phase equilibria; properties of solutions; simple one- and two-component phase diagrams. The conceptual development of thermodynamic principles from both macroscopic and molecular levels, and the application of these principles to systems of interest to chemists, biochemists, and engineers will be emphasized. Note: This course may not be taken for credit if credit has already been received in CHEM 271. Prerequisites: CHEM 102 or 105; MATH 101 or 115. SCI 100 may be used in lieu of CHEM 102 and MATH 115. Engineering students who take this course will receive ★4.5.

**CHEM 373 Physical Properties and Dynamics of Chemical Systems**

★3 (fi 6) (second term, 3-0-3). A continuation of CHEM 371 in which the physical properties of chemical systems and the dynamics and energetics of chemical processes are discussed. Topics include: colligative properties; electrochemical cells and ion activities, implications for ionic equilibria; kinetic theory and transport properties of gases and liquids; surfaces and colloid chemistry; reaction dynamics, detailed mechanisms of chemical reactions, catalysis. The emphasis will be on the development of principles of physical chemistry and their application to properties and processes of interest to chemists, biochemists, and engineers. Note: This course may not be taken for credit if credit has already been received in CHEM 273 or 275. Prerequisite: CHEM 371 or CHEM 271.

**CHEM 398 Molecular Spectroscopy**

★3 (fi 6) (either term, 3-0-3). An integrated course in the quantitative and more advanced aspects of spectroscopy and its applications in chemistry. The subjects will include: absorption, emission, dichroism, vibrational and rotational spectroscopy of molecules; time-resolved spectroscopy; and electron spin and nuclear magnetic resonance spectroscopy. Prerequisites: CHEM 282; 298; 243.

**CHEM 400 Industrial Internship Practicum**

★3 (fi 6) (first term, 0-3s-0). Required by all students who have just completed a Chemistry Industrial Internship program. Must be completed during the first academic term following return to full-time studies. Note: A grade of F to A+ will be determined by the student's job performance as evaluated by the employer, by the student's performance in the completion of an internship practicum report, and by the student's ability demonstrated in an oral presentation. This course cannot be used in place of a senior-level CHEM option. Prerequisite: WKEXP 956.

**CHEM 401 Introduction to Chemical Research**

★3 (fi 6) (either term, 0-1s-8). Introduction to methods of chemical research. Investigational work under the direction of a member of the Department. The results of the research will be submitted to the Department as a report which will be graded. The student must also make an oral presentation of this work to the Department. For students in the fourth year of Honors or Specialization Chemistry. Students should consult with the Course Coordinator four months prior to starting the course. Prerequisites: a 300-level CHEM course and consent of the Course Coordinator.

**CHEM 403 Chemical Research**

★3 (fi 6) (either term, 0-1s-8). Investigational work under the direction of a member of the Department. Prerequisite or corequisite: CHEM 401.

**CHEM 405 Special Topics in Chemistry**

★3 (fi 6) (either term, 3-0-0). Prerequisite: a 300-level CHEM course and consent of Instructor.

**CHEM 406 Special Topics in Chemistry**

★3 (fi 6) (either term, 3-0-0). Prerequisites: vary depending on topic. Check course notes on Bear Tracks for specific prerequisites.

**CHEM 419 Bioanalytical Chemistry**

★3 (fi 6) (second term, 3-0-0). Introduction to the methods used to analyze biomolecules and the analytical methods that exploit the molecular recognition properties of biomolecules. Topics may include an introduction to biomolecule structure and function, enzyme assays, immunoassays, biosensors, electrophoresis, DNA sequencing techniques, bioinformatics and molecular visualization, molecular biology, and fluorescence imaging. Prerequisite: CHEM 313.

**CHEM 424 Optical Spectroscopy and Electrochemistry**

★3 (fi 6) (first term, 3-0-0). Optical spectroscopy and electrochemistry and principles and applications to chemical analysis. Electronic and vibrational spectroscopy for

probing and monitoring chemical and biochemical systems. Electrode kinetics, mass transport, and voltammetry for electroanalysis. Prerequisite: CHEM 313.

#### CHEM 425 Separations and Mass Spectrometry

★3 (fi 6) (first term, 3-0-0). Concepts and techniques in chromatography, mass spectrometry, and chromatography/MS combinations. Examples of modern instrumentation as well as applications to chemical, biochemical, and biomedical analysis. Prerequisite: CHEM 313.

#### CHEM 434 X-ray Crystallography

★3 (fi 6) (either term, 3-0-0). An introduction to structure determination by single-crystal X-ray diffraction methods. Topics include X-ray diffraction, crystal symmetry, experimental methods, structure solution, refinement, crystallographic software, and interpretation of crystal structure data. Prerequisite: CHEM 243 and one 300-level CHEM course; or CHEM 333 or 341; or consent of the instructor.

#### CHEM 436 Synthesis and Applications of Inorganic and Nano-materials

★3 (fi 6) (either term, 3-0-0). Introduction to methods of synthesizing inorganic materials with control of atomic, meso and micro-structure. Topics include sol-gel chemistry, chemical vapor deposition, electro-synthesis of materials, solid-state reactions, solid-state metathesis and high-temperature self-propagating reactions, template-directed syntheses of micro and mesoporous materials, micelles and colloids, synthesis of nanoparticles and nanomaterials. Applications of these synthetic techniques to applications such as photonic materials, heterogeneous catalysts, magnetic data storage media, nanoelectronics, display technologies, alternative energy technologies, and composite materials will be discussed. Prerequisite: CHEM 243 and one 300-level CHEM course; or CHEM 341; or CHEM 333; or consent of the instructor.

#### CHEM 437 Transition Metal Chemistry

★3 (fi 6) (either term, 3-0-0). CHEM 437 is an introduction to organotransition metal chemistry. The course will deal with the synthesis, basic bonding, and reactivity of organotransition metal complexes. Topics to be covered include transition metal complexes of hydrides, phosphines, carbonyls, olefins, alkynes, polyolefins, cyclopentadienyl and related cyclic pi-ligands; metal-carbon sigma- and multiple bonds. The application of these complexes to homogeneous catalysis and to organic synthesis will be discussed when appropriate. Prerequisite: CHEM 243 and one 300-level CHEM course; or CHEM 341; or consent of the instructor.

#### CHEM 438 Solid State Chemistry

★3 (fi 6) (either term, 3-0-0). Introduction to the chemistry of extended inorganic solids. The topics covered include synthesis, symmetry, descriptive crystal chemistry, bonding, electronic band structures, characterization techniques, and phase diagrams. The correlation of structure with properties of electronic and magnetic materials will be discussed. Prerequisite: CHEM 243 and one 300-level CHEM course; or CHEM 333 or 341 or consent of the instructor.

#### CHEM 439 Inorganic Reaction Mechanisms

★3 (fi 6) (either term, 3-0-0). Covers the mechanisms of reactions of transition metal compounds in solution. Detailed consideration is given to ligand substitution, isomerization, fluxional, photochemical and electron transfer reactions of coordination compounds and organometallic species. The application of kinetic and other methods to mechanistic elucidation are critically evaluated. Prerequisite: CHEM 243 and one 300-level CHEM course; or CHEM 341; or consent of the instructor.

#### CHEM 444 Characterization Methods in Nanoscience

★3 (fi 6) (either term, 3-0-0). Introduction to techniques in determining the composition and structure of materials on the nanometer scale. Characterization of atomic, meso and micro-structure of materials including impurities and defects. Major topics will include diffraction (X-ray, electron, neutron), electron microscopy (transmission, scanning, and Auger) and associated spectroscopies (EDX, EELS), surface sensitive spectroscopies (e.g., XPS, AES, IR) and spectrometry (SIMS), synchrotron techniques, X-ray absorption, fluorescence and emission, and scanned probe microscopies (AFM, STM, etc.). The strengths, weaknesses, and complementarity of the techniques used will be examined via case studies on the characterization of real-world nanotechnologies, such as heterogeneous catalysts, surfaces and interfaces in semiconductor devices, organic monolayers on metals and semiconductors, nanotube and nanowire-based electronics, and biocompatible materials. Prerequisite: fourth year standing or permission of Instructor.

#### CHEM 461 Qualitative Organic Analysis

★3 (fi 6) (second term, 3-0-4). Introductory discussion of the physical techniques used in organic chemistry research for the separation/purification and structural elucidation of organic compounds. Emphasis is on the combined use of modern spectrometric techniques for structure determination, with particular focus on an introduction to modern NMR spectroscopy. Prerequisite: CHEM 363 or consent of Instructor.

#### CHEM 462 Physical Organic Chemistry

★3 (fi 6) (first term, 3-0-0). Discussion of organic structural theories, intramolecular and intermolecular interactions in organic chemistry, and the mechanisms and reactive intermediates involved in organic reactions. Prerequisite: CHEM 363 or consent of Instructor.

#### CHEM 463 Organic Synthesis

★3 (fi 6) (first term, 3-0-0). Discussion of the chemoselective, regioselective and

stereoselective reactions of organic compounds. Emphasis on modern methodology for organic synthesis. Prerequisite: CHEM 363 or consent of Instructor.

#### CHEM 477 Molecular Symmetry and Spectroscopy

★3 (fi 6) (either term, 3-0-0). Application of the principles of molecular symmetry to molecular properties. Topics include group theory with emphasis on vibrational motion and normal vibrations; quantum mechanics of vibration and rotation; magnetic resonance spectroscopy; perturbation methods; selection rules in rotational, infrared, and Raman spectroscopy; molecular symmetry and molecular orbitals; electronic spectroscopy of polyatomic molecules. Prerequisite: CHEM 383; or CHEM 282 and CHEM 298 and one 300-level Chemistry course; or consent of Instructor.

#### CHEM 479 Molecular Kinetics

★3 (fi 6) (either term, 3-0-0). Rate laws for simple and complex reactions, reaction mechanisms, potential energy surfaces, molecular dynamics, theories of reaction rates, catalysis, with application to gas and liquid phase reactions, photochemical reactions in chemistry and biology, and enzyme catalysis. Prerequisites: CHEM 273 or CHEM 373; MATH 215, PHYS 230, and a 300-level Chemistry course.

#### CHEM 483 Applications of Nuclear Magnetic Resonance

★3 (fi 6) (either term, 3-0-0). Theory of magnetic resonance spectroscopy and some of its applications to chemical systems. The curriculum includes: (1) a cursory discussion of first order NMR spectra; (2) quantum mechanics of spin systems and a quantum description of magnetic resonance experiments (the Bloch equations); (3) relaxation effects; (4) Fourier transform spectroscopy; (5) chemical exchange effects; (6) nuclear Overhauser effects; and (7) two dimensional NMR. Prerequisite: CHEM 383; or CHEM 282 and CHEM 298 and one 300-level Chemistry course; or consent of Instructor.

#### CHEM 489 Biomolecular Spectroscopy

★3 (fi 6) (either term, 3-0-0). Focus is on electronic and vibrational spectroscopic techniques, and their application to biological molecules. Particular emphasis on the use of absorption, luminescence, infra-red, and Raman spectroscopies, and dichroic techniques in probing the structure and dynamics of biological molecules. A significant portion of the course will also include the general study of excited state photophysics and photochemistry, with specific examples in biology. Prerequisite: CHEM 298 and one 300-level Chemistry course or CHEM 383.

#### CHEM 493 Computational Chemistry

★3 (fi 6) (either term, 3-0-0). Applications are stressed in this course which introduces the student to contemporary computational quantum chemistry to the Hartree-Fock limit, using state-of-the-art computer codes running on UNIX workstations. Elementary introduction to the UNIX operating system is given. Subjects include optimization of the geometry of molecules; prediction of molecular properties; calculation of infra-red and Raman spectra; solvent effects; thermochemistry of chemical reactions. Assignments in the course will allow the student to use advanced workstations and computer codes. Prerequisite: CHEM 383 or CHEM 282 and one 300-level Chemistry course or consent of Instructor.

#### CHEM 495 Molecular Dynamics and its Applications

★3 (fi 6) (either term, 3-0-0). An introduction to Molecular Dynamics and its applications. The fundamentals of statistical mechanics are reviewed and computational tools such as molecular dynamics and Monte Carlo methods are presented. Applications include the study of structural properties of liquids, the diffusion of a solute in a solvent, the dynamics of proton transfer, and the calculation of rate constants. These topics will be exemplified using computer simulations as problem set assignments. Some lectures will take place in the computer laboratory where visualization tools will be used to illustrate various applications of molecular dynamics. Prerequisite: CHEM 282 and one 300-level CHEM course; or CHEM 383; or consent of the instructor.

## Graduate Courses

#### CHEM 502 Departmental Research Seminar

★0 (fi 4) (two term, 0-2s-0).

#### CHEM 504 Advanced Research Seminar

★0 (fi 4) (two term, 0-2s-0).

#### CHEM 505 Special Topics in Chemistry

★3 (fi 6) (either term, 3-0-0).

#### CHEM 506 Special Topics in Chemistry

★3 (fi 6) (either term, 3-0-0).

#### CHEM 511 Biomolecular Chemistry

★1.5 (fi 3) (second term, 3/2-0-0). Six week course with topics that may include: biomolecule structure and function, enzymology, molecular biology, protein engineering, bioconjugate chemistry, bioinformatics and molecular visualization. Not open to students with credit in CHEM 419.

#### CHEM 512 Optical Spectroscopy

★1.5 (fi 3) (first term, 3/2-0-0). Six week course on optical spectroscopy. Topics may include electromagnetic spectrum, transitions and selection rules, instrumentation, atomic spectroscopy, molecular absorption, fluorescence, vibrational spectroscopy, applications of optical spectroscopy. Not open to students with credit in CHEM 424.



**CHEM 514 Electrochemistry**

★1.5 (fi 3) (first term, 3/2-0-0). Six week course on electrochemistry. Topics may include electrochemical potentials, junction potentials, interfaces, potentiometry/ion selective electrodes, kinetics, electron transport theory, mass transport, voltammetry, microelectrodes, solid electrodes. Not open to students with credit in CHEM 424.

**CHEM 516 Separations**

★1.5 (fi 3) (first term, 3/2-0-0). Six week course on separations with topics that may include LC, GC, intermolecular forces, retention mechanisms, gradient elutions, separation optimization, band broadening, HPLC modes-size exclusion, ion exchange, HILIC. Not open to students with credit in CHEM 425.

**CHEM 518 Mass Spectrometry**

★1.5 (fi 3) (first term, 3/2-0-0). Six week course on mass spectrometry with topics that may include mass analyzers, sample introduction techniques, ionization techniques, ion detection and data systems, applications. Not open to students with credit in CHEM 425.

**CHEM 519 Bioanalytical Chemistry**

★1.5 (fi 3) (second term, 3/2-0-0). Six week course with topics that may include antibodies, immunoassays, surface plasmon resonance, biosensors, gel electrophoresis, DNA sequencing, microscopy and imaging. Not open to students with credit in CHEM 419.

**CHEM 520 Electronics**

★1.5 (fi 3) (second term, 3/2-0-0). Six week course on electronics with topics that may include: linear electronics, including operational amplifiers; digital electronics, including timing circuits; counters and logic; fundamental and practical sources of noise in electronic circuits; data processing, including filtering. Prerequisite: consent of department.

**CHEM 522 Surface Chemistry and Analysis**

★1.5 (fi 3) (second term, 3/2-0-0). Six week course with topics that may include surface preparation and selectivity, probes of surface composition and structure, Surface Optical Spectroscopy (FTIR, reflectance, Raman) Surface Enhanced Raman Spectroscopy, Secondary Ion Mass Spectrometry, chemical modification of surfaces.

**CHEM 531 Organometallic Chemistry**

★3 (fi 6) (second term, 3-0-0). Prerequisite: CHEM 437 or consent of Department.

**CHEM 533 Asymmetric Catalysis**

★3 (fi 6) (either term, 3-0-0).

**CHEM 534 X-ray Crystallography**

★3 (fi 6) (either term, 3-0-0). An introduction to structure determination by single-crystal X-ray diffraction methods. Topics include X-ray diffraction, crystal symmetry, experimental methods, structure solution, refinement, crystallographic software, and interpretation of crystal structure data. Not open to students with credit in CHEM 433 or 434.

**CHEM 536 Synthesis and Applications of Inorganic and Nano-materials**

★3 (fi 6) (either term, 3-0-0). Introduction to methods of synthesizing inorganic materials with control of atomic, meso and micro-structure. Topics include sol-gel chemistry, chemical vapor deposition, electro-synthesis of materials, solid-state reactions, solid-state metathesis and high-temperature self-propagating reactions, template-directed syntheses of micro and mesoporous materials, micelles and colloids, synthesis of nanoparticles and nanomaterials. Applications of these synthetic techniques to applications such as photonic materials, heterogeneous catalysts, magnetic data storage media, nanoelectronics, display technologies, alternative energy technologies, and composite materials will be discussed. Not open to students with credit in CHEM 436.

**CHEM 537 Transition Metal Chemistry**

★3 (fi 6) (either term, 3-0-0). Graduate level course on organotransition metal chemistry. The course will deal with the synthesis, bonding, and reactivity of organotransition metal complexes. Topics to be covered include transition metal complexes of hydrides, phosphines, carbonyls, olefins, alkynes, polyolefins, cyclopentadienyl and related cyclic pi-ligands; metal-carbon sigma- and multiple bonds. The application of these complexes to homogeneous catalysis and to organic syntheses will be discussed when appropriate. Prerequisite: consent of instructor. Not open to students with credit in CHEM 437.

**CHEM 538 Special Topics in Solid State Chemistry**

★3 (fi 6) (either term, 3-0-0). Introduction to the chemistry of extended inorganic solids. The topics covered include synthesis, symmetry, descriptive crystal chemistry, bonding, electronic band structures, characterization techniques, and phase diagrams. The correlation of structure with properties of electronic and magnetic materials will be discussed. Not open to students with credit in CHEM 438.

**CHEM 544 Characterization Methods in Nanoscience**

★3 (fi 6) (either term, 3-0-0). Introduction to techniques in determining the composition and structure of materials on the nanometer scale. Characterization of atomic, meso-, and micro-structure of materials including impurities and defects. Major topics will include diffraction (X-ray, electron, neutron), electron microscopy (transmission, scanning, and Auger) and associated spectroscopies

(EDX, EELS), surface sensitive spectroscopies (e.g., XPS, AES, IR) and spectrometry (SIMS), synchrotron techniques, X-ray absorption, fluorescence and emission, and scanned probe microscopies (AFM, STM, etc.). The techniques will be examined through real-world nanotechnology case studies. Not open to students with credit in CHEM 444.

**CHEM 545 Special Topics in Inorganic Chemistry**

★3 (fi 6) (either term, 3-0-0).

**CHEM 561 Qualitative Organic Analysis**

★3 (fi 6) (second term, 3-0-4). Introductory graduate-level discussion of the physical techniques used in organic chemistry research for the separation/purification and structural elucidation of organic compounds. Emphasis is on the combined use of modern spectrometric techniques for structure determination, with particular focus on an introduction to modern NMR spectroscopy. Not open to students with credit in CHEM 461.

**CHEM 562 Physical Organic Chemistry**

★3 (fi 6) (first term, 3-0-0). Graduate-level discussion of organic structural theories, intramolecular and intermolecular interactions in organic chemistry, and the mechanisms and reactive intermediates involved in organic reactions. Not open to students with credit in CHEM 462 or 465.

**CHEM 563 Organic Synthesis**

★3 (fi 6) (first term, 3-0-0). Graduate-level discussion of the chemoselective, regioselective and stereoselective reactions of organic compounds. Emphasis on modern methodology for organic synthesis. Not open to students with credit in CHEM 463 or 467.

**CHEM 577 Molecular Symmetry and Spectroscopy**

★3 (fi 6) (either term, 3-0-0). Application of the principles of molecular symmetry to molecular properties. Topics include group theory with emphasis on vibrational motion and normal vibrations; quantum mechanics of vibration and rotation; magnetic resonance spectroscopy; perturbation methods; selection rules in rotational, infrared, and Raman spectroscopy; molecular symmetry and molecular orbitals; electronic spectroscopy of polyatomic molecules. Not open to students with credit in CHEM 477.

**CHEM 579 Molecular Kinetics**

★3 (fi 6) (either term, 3-0-0). Rate laws: for simple and complex reactions, reaction mechanisms, potential energy surfaces, molecular dynamics, theories of reaction rates, catalysis, with application to gas and liquid phase reactions, photochemical reactions in chemistry and biology, and enzyme catalysis. Not open to students with credit in CHEM 479.

**CHEM 583 Applications of Nuclear Magnetic Resonance**

★3 (fi 6) (either term, 3-0-0). Theory of magnetic resonance spectroscopy and some of its applications to chemical systems. The curriculum includes: (1) a cursory discussion of first order NMR spectra; (2) quantum mechanics of spin systems and a quantum description of magnetic resonance experiments (the Bloch equations); (3) relaxation effects; (4) Fourier transform spectroscopy; (5) chemical exchange effects; (6) nuclear Overhauser effects; and (7) two-dimensional NMR. Not open to students with credit in CHEM 483.

**CHEM 589 Biomolecular Spectroscopy**

★3 (fi 6) (either term, 3-0-0). Focus is on electronic and vibrational spectroscopic techniques, and their application to biological molecules. Particular emphasis on the use of absorption, luminescence, infrared, and Raman spectroscopies, and dichroic techniques in probing the structure and dynamics of biological molecules. A significant portion of the course will also include the general study of excited state photophysics and photochemistry, with specific examples in biology. Not open to students with credit in CHEM 489.

**CHEM 593 Computational Chemistry**

★3 (fi 6) (either term, 3-0-0). Applications are stressed in this course that introduces the student to contemporary computational quantum chemistry to the Hartree-Fock limit, using state-of-the-art computer codes running on UNIX workstations. Elementary introduction to the UNIX operating system is given. Subjects include optimization of the geometry of molecules; prediction of molecular properties; calculation of infrared and Raman spectra; solvent effects; thermochemistry of chemical reactions. Assignments in the course will allow the student to use advanced workstations and computer codes. Not open to students with credit in CHEM 493.

**CHEM 595 Molecular Dynamics and its Applications**

★3 (fi 6) (either term, 3-0-0). An introduction to Molecular Dynamics and its applications. The fundamentals of statistical mechanics are reviewed and computational tools such as molecular dynamics and Monte Carlo methods are presented. Applications include the study of structural properties of liquids, the diffusion of a solute in a solvent, the dynamics of proton transfer, and the calculation of rate constants. These topics will be exemplified using computer simulations as problem set assignments. Some lectures will take place in the computer laboratory where visualization tools will be used to illustrate various applications of molecular dynamics. Not open to students with credit in CHEM 495.

**CHEM 599 Fundamentals and Applications of Mass Spectrometry**

★3 (fi 6) (either term, 3-0-0). Recent advances in ion sources and mass analyzers

have transformed mass spectrometry (MS) into a dominant research tool in many areas of chemistry and biochemistry. The objective of this course is to provide students with an understanding of the theory underlying the operation and application of MS to diverse chemical and biochemical problems. Emphasis will be placed on the role of gas-phase ion chemistry in MS experiments. The first part of this course will deal with the operating principles of the different types of mass analyzers, as well as the ionization techniques used to generate gas-phase ions. The second part of the course will examine chemical applications of MS. Included will be a detailed discussion of the dissociation techniques used to obtain structural information. Prerequisite: CHEM 383; or CHEM 282 and CHEM 373; or consent of Instructor.

#### CHEM 612 Advanced Optical Spectroscopy

★1.5 (fi 3) (second term, 3/2-0-0). Six week course with topics that may include: sources, wavelength analyzers, interferometers, detectors, signal/noise, signal processing, advanced Raman spectroscopy, single molecule fluorescence and fluorescence imaging, Surface Enhanced Raman Spectroscopy. Prerequisite: CHEM 512.

#### CHEM 614 Advanced Electrochemistry

★1.5 (fi 3) (second term, 3/2-0-0). Six week course with topics that may include: CV and chemical reactions, microelectrode applications, carbon electrodes, modified electrode surfaces, micro-fabricated sensors, scanning probe microscopy, spectroelectrochemistry, rotating disk electrochemistry, AC voltammetry. Prerequisite: CHEM 514.

#### CHEM 616 Advanced Separations

★1.5 (fi 3) (second term, 3/2-0-0). Six week course with topics that may include: multidimensional separations, ion chromatography, CE, biological HPLC, advanced sample preparation/introduction techniques. Prerequisite: CHEM 516.

#### CHEM 618 Advanced Mass Spectrometry

★1.5 (fi 3) (second term, 3/2-0-0). Six week course with topics that may include: mass analyzers and ionization techniques, vacuum systems, advanced sample introduction techniques, tandem MS, mass spectral interpretation, quantitative MS, MS applications. Prerequisite: CHEM 518.

#### CHEM 623 Special Topics in Advanced Analytical Chemistry

★1.5 (fi 3) (either term, 3/2-0-0). Course may be repeated for credit, provided there is no duplication of specific topic.

#### CHEM 665 Special Topics in Physical Organic Chemistry

★3 (fi 6) (either term, 3-0-0). Advanced treatment of selected topics in modern physical organic chemistry, drawn from one or more of the following: (1) molecular recognition, (2) organic materials and devices, and (3) multidimensional NMR spectroscopic analysis. Other topic selections appropriate to the category may also be offered. Course may be repeated for credit, provided there is no duplication of specific topic.

#### CHEM 667 Special Topics in Synthetic Chemistry

★3 (fi 6) (either term, 3-0-0). Advanced treatment of selected topics in modern synthetic organic chemistry, drawn from one or more of the following: (1) advanced methodology for organic synthesis, (2) carbohydrate structure and synthesis, (3) organometallic methodology for organic synthesis, and (4) solid-phase organic synthesis and combinatorial chemistry. Other topics appropriate to the category may also be offered. Course may be repeated for credit, provided there is no duplication of specific topic. Prerequisite: CHEM 563 or consent of Instructor.

#### CHEM 669 Special Topics in Bio-organic Chemistry

★3 (fi 6) (either term, 3-0-0). Advanced discussion of selected topics in modern bio-organic chemistry, drawn from one or more of the following: (1) natural products and secondary metabolism, (2) nucleic acid chemistry, and (3) organic and biophysical carbohydrate chemistry. Other topics appropriate to the category may also be offered. Course may be repeated for credit, provided there is no duplication of specific topic.

#### CHEM 681 Special Topics in Physical Chemistry :

★3 (fi 6) (second term, 3-0-0). Prerequisite: consent of Department. Course may be repeated for credit, provided there is no duplication of specific topic.

## 231.77 Chimie, CHIM

Faculté Saint-Jean

### Cours de 1er cycle

#### CHIM 101 Introduction à la chimie I

★3 (fi 6) (premier semestre, 3-1s-3). Structure atomique, liaisons covalentes, thermochimie, équilibre chimique, acides et bases, les éléments représentatifs. Préalable(s): Chimie 30 ou l'équivalent.

#### CHIM 102 Introduction à la chimie II

★3 (fi 6) (deuxième semestre, 3-1s-3). États de la matière et forces intermoléculaires, solubilité et solutions, électrochimie, thermodynamique chimique, cinétique chimique, liaison et propriétés des métaux de transition. Préalable(s): CHIM 101.

#### CHIM 103 Introduction à la chimie I

★3 (fi 6) (l'un ou l'autre semestre, 3-1s-3/2). Stoechiométrie, gaz parfaits,

thermochimie, équilibre chimique, acides et bases, structure atomique et liaison chimique. Préalable(s): Chimie 30 ou l'équivalent. Note: Ce cours est réservé aux étudiants de génie.

#### CHIM 105 Introduction à la chimie II

★3 (fi 6) (l'un ou l'autre semestre, 3-0-3/2). Solubilité, cellule électrochimique et équation de Nernst, cinétique chimique, modes de liaison et structure, cinétique chimique, modes de liaison et structure, chimie des éléments de transition. Préalable(s): CHIM 103. Note: Ce cours est réservé aux étudiants de génie.

#### CHIM 161 Chimie organique I

★3 (fi 6) (premier semestre, 3-0-3). Etude de la structure moléculaire et de la réactivité des composés organiques basée sur leurs groupes fonctionnels. Introduction à la nomenclature, la structure tridimensionnelle, les propriétés physiques, et réactivité des composés de carbone. L'accent sera mis sur les alcanes, les alcènes, les alcynes, les halogénures d'alkyle, les alcools, et certains composés aromatiques. Les exemples comprendront les hydrocarbures (produits pétroliers) composés organiques halogénés (pesticides), et les polymères d'une importance industrielle que l'on retrouve dans la vie de tous les jours. Note: Les étudiants ayant des crédits en CHIM 101 et 102 devront normalement suivre CHIM 261. Préalable(s): Chimie 30 ou l'équivalent.

#### CHIM 211 Analyse quantitative I

★3 (fi 6) (l'un ou l'autre semestre, 3-0-4). Principes, méthodes et applications expérimentales avec emphase sur les équilibres de phases solubles, la titrimétrie, les compétences en laboratoire, et l'évaluation de données expérimentales. Exemples en analyse organique et inorganique. Préalable: CHIM 102.

#### CHIM 213 Analyse quantitative II

★3 (fi 6) (l'un ou l'autre semestre, 3-0-4). Suite de CHIM 211 avec accent sur les principes, méthodes et applications expérimentales de techniques de séparation, la spectrométrie atomique et moléculaire, l'électrochimie et l'analyse de données expérimentales. Exemples d'analyse organique et inorganique et utilisation de la littérature analytique. Préalable: CHIM 211.

#### CHIM 261 Chimie organique I

★3 (fi 6) (premier semestre, 3-0-3). Corrélation des structures et des liaisons chimiques des composés de carbone avec les propriétés physiques et la réactivité chimique des molécules organiques. Etude des groupes fonctionnels. L'accent sera mis sur les hydrocarbures et leurs dérivés qui contiennent les hétéroatomes (halogènes, oxygène, soufre, et groupe hydroxy). Introduction à la stéréochimie, la structure tridimensionnelle, les mécanismes, en particulier addition aux doubles liaisons, substitution nucléophile et réactions d'élimination. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour CHIM 161. Préalables: CHIM 101 ou 102.

#### CHIM 263 Chimie organique II

★3 (fi 6) (deuxième semestre, 3-0-3). Continuation de l'étude des propriétés structurales et chimiques des groupes fonctionnels avec l'accent sur les alcynes, les composés aromatiques, les aldéhydes, les cétones, les acides carboxyliques et leurs dérivés, et les amines. Exemples de ces groupes fonctionnels dans les produits naturels; les hydrates de carbone, les amino-acides et les protéines, les acides nucléiques, et les lipides. Etude de la déduction des structures des molécules organiques par spectroscopie infrarouge et spectroscopie de résonance magnétique nucléaire. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour CHIM 163. Préalable(s): CHIM 261.

## 231.78 Chinese, CHINA

Department of East Asian Studies  
Faculty of Arts

### Undergraduate Courses

#### Notes

- (1) The Department reserves the right to place students in the language course appropriate to their level of language skill.
- (2) Placement tests may be administered in order to assess prior background. Students with an Asian (Chinese, Japanese, Korean) language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in a more advanced course suitable to their level of ability or they may be encouraged to seek "Credit by Special Assessment" (see §44.5) when appropriate.
- (3) The Department will withhold credit from students completing courses for which prior background is deemed to make them ineligible. For example, 100-level courses are normally restricted to students with little or no prior knowledge in that language. Should a student with matriculation standing, or those possessing prior background (such as native speakers or those for whom it is their first language) register in the 100-level courses, credit may be withheld.

#### **O** CHINA 101 Basic Chinese I

★3 (fi 6) (either term, 5-0-0). A non-intensive introduction to Mandarin Chinese. Note: Not open to students with matriculation in Chinese, i.e., CHINA 30 or equivalent.

**O CHINA 102 Basic Chinese II**

★3 (*fi 6*) (either term, 5-0-0). A continuation of CHINA 101. Prerequisite: CHINA 101. Note: Not open to students with matriculation in Chinese, i.e., CHINA 30 or equivalent.

**O CHINA 201 Basic Chinese III**

★3 (*fi 6*) (either term, 5-0-0). A continuation of CHINA 102. Designed to develop further basic skills in spoken and written Chinese. Prerequisite: CHINA 102.

**O CHINA 202 Basic Chinese IV**

★3 (*fi 6*) (either term, 5-0-0). A continuation of CHINA 201. Designed to develop further basic skills in spoken and written Chinese. Prerequisite: CHINA 201.

**O CHINA 208 Overview of the Chinese Language System**

★3 (*fi 6*) (either term, 3-0-0). Discussion of basic features of the Chinese language. Designed to be taken concurrently with CHINA 201 or 202. Taught in English. Note: This course will NOT fulfill the Language other than English requirement of the B.A. degree. Prerequisites: CHINA 102 or consent of the Department.

**O CHINA 211 Mandarin Chinese I**

★3 (*fi 6*) (first term, 3-0-1). Designed for speakers proficient in one of the regional dialects of Chinese to gain fluency and literacy standard Mandarin or for Mandarin speakers to learn reading and writing.

**O CHINA 212 Mandarin Chinese II**

★3 (*fi 6*) (second term, 3-0-1). Continuation of CHINA 211. Prerequisite: CHINA 211.

**O CHINA 238 Contrastive Analysis of Chinese and English**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the grammatical structures, syntax, and semantics of Chinese and English. Prerequisite: CHINA 202 or consent of Department.

**O CHINA 240 Chinese Literature and the Arts**

★3 (*fi 6*) (either term, 3-0-0). The relationship between modern literature and pre-modern literature and major art forms in China. Taught in English. No prerequisite. This course will not fulfill the Language other than English requirement of the BA.

**O CHINA 301 Intermediate Chinese I**

★3 (*fi 6*) (first term, 4-0-0). Continuing study of spoken and written modern standard Chinese. Conversation and composition are integrated with reading and discussion of texts of modern Chinese prose, fiction, and other kinds of writing. Prerequisite: CHINA 202 and 208, or consent of Department.

**O CHINA 302 Intermediate Chinese II**

★3 (*fi 6*) (second term, 4-0-0). A continuation of CHINA 301. Prerequisite: CHINA 301 or consent of Department.

**O CHINA 308 Introduction to Chinese Linguistics**

★3 (*fi 6*) (either term, 3-0-0). Introduction of the Chinese sound system, basic sentence structure, writing system, and language change and variation. Taught in English. This course will not fulfill the Language other than English requirement of the BA degree. Prerequisites: CHINA 202 and 208 or consent of the Department.

**L CHINA 310 Overview of Chinese Dialects**

★3 (*fi 6*) (either term, 3-0-0). Language systems of major Chinese dialects. Taught in English. Note: This course will NOT fulfill the language other than English requirement of the B.A. degree. Prerequisite: CHINA 202 or consent of Department.

**O CHINA 318 Business Chinese I**

★3 (*fi 6*) (either term, 3-0-0). Intermediate level of modern standard Chinese with emphasis on the vocabulary and communication style of the Chinese business world. Prerequisite: CHINA 202 or consent of Department.

**O CHINA 321 Pre-modern Chinese Literature in English Translation**

★3 (*fi 6*) (either term, 3-0-0). Chinese Literature from earliest times through the Qing Dynasty. Readings and lectures in English. Note: Does not fulfill any Faculty of Arts Language other than English requirement. Not open to students with credit in China 323.

**O CHINA 322 Modern Chinese Literature in English Translation**

★3 (*fi 6*) (either term, 3-0-0). Chinese literature of the 20th and 21st centuries. Readings and lectures in English. Prerequisite: CHINA 321 or consent of the Department. Note: Does not fulfill any Faculty of Arts Language other than English requirement. Not open to students with credit in CHINA 427.

**O CHINA 337 Women in Modern Chinese Literature and Film**

★3 (*fi 6*) (either term, 3-0-0). Roles of women as writers/filmmakers and as subjects within literary works and movies. Readings and lectures in English. Note: This course does not fulfill the Language other than English requirement of the BA degree.

**O CHINA 341 Classical Chinese I**

★3 (*fi 6*) (first term, 3-0-0). An introduction to the syntax and semantic structures of classical Chinese. Prerequisite: CHINA 200 or 202.

**O CHINA 342 Classical Chinese II**

★3 (*fi 6*) (second term, 3-0-0). A continuation of CHINA 341. Prerequisite: CHINA 341.

**CHINA 351 Culture and Identity in Taiwan**

★3 (*fi 6*) (either term, 3-0-0). The relationship between culture and identity in Taiwan through the study of literature and film in translation. Readings and lectures in English. Note: Does not fulfill any Faculty of Arts requirement for a Language other than English.

**CHINA 370 The Chinese Language in its Cultural Setting II**

★6 (*fi 12*) (two term, 15-0-0). A language/culture immersion course offered in China. Designed for improving of oral/aural skills and increasing understanding of Chinese people and culture. Note: Offered in alternate years. CHINA 280 and 380 may not both be taken for credit. Prerequisite: CHINA 302 or consent of Department. Not open to students with credit in CHINA 450.

**O CHINA 376 Topics in Early and Medieval Chinese Literature**

★3 (*fi 6*) (either term, 3-0-0). Readings in translation, with selected original language materials for advanced language students. May be repeated for credit when course content differs.

**CHINA 401 Advanced Chinese I: Chinese in Mass Media**

★3 (*fi 6*) (either term, 3-0-0). Chinese language through contemporary film, television programs and newspapers. Prerequisite: CHINA 302 or consent of Department.

**CHINA 402 Advanced Chinese II: Literature and Society**

★3 (*fi 6*) (either term, 3-0-0). Development of language skills through reading modern fiction and/or non-fiction. Introduction to important issues and themes in modern Chinese society and literature. Readings in Chinese; lectures in English and/or Chinese. Prerequisite: CHINA 401 or consent of Department.

**CHINA 407 Advanced Readings in Modern Chinese**

★3 (*fi 6*) (either term, 3-0-0). Advanced readings from newspapers, magazines, social commentary and/or literary prose. Prerequisite: CHINA 402 or consent of Department.

**O CHINA 410 Classical Chinese Poetry**

★3 (*fi 6*) (either term, 3-0-0). Emphasis on the production of poetry as a cultural object. Readings in Chinese; lectures in English and/or Chinese. Note: Not open to students with credit in CHINA 423. Prerequisite: CHINA 342 or consent of Department.

**O CHINA 414 Chivalric Tales and Love Stories**

★3 (*fi 6*) (either term, 3-0-0). Language and literary conventions in vernacular fiction and drama. Readings in Chinese; lectures in English and/or Chinese. Prerequisite: CHINA 302 or consent of Department.

**O CHINA 420 Chinese Modernity: Literature and Film**

★3 (*fi 6*) (either term, 3-0-0). A cross-disciplinary study of literary and cinematic texts from modern China. Prerequisite: CHINA 402 and/or consent of Department.

**CHINA 421 Topics in Chinese Literary History**

★3 (*fi 6*) (either term, 0-3s-0). The major works in English translation of a particular period or aspect of Chinese literature prior to 1900. Prerequisite: CHINA 321 or consent of department. Note: May be repeated for credit when course content differs. Does not fulfill any Faculty of Arts Language other than English requirement.

**O CHINA 425 Post-Mao Fiction**

★3 (*fi 6*) (either term, 3-0-0). A discussion of the major literary trends and the fictional works of important writers who have emerged in the post-Mao era (since 1976). Readings and lectures in English. Prerequisite: Any 300-level literature course or consent of Department. Note: This course will not fulfill the Language other than English requirement of the BA.

**CHINA 428 Chinese-English Translation**

★3 (*fi 6*) (either term, 3-0-0). Theory and practice in translation as applied to Chinese and English literary and non-literary texts. Prerequisite: CHINA 438 or consent of Department.

**CHINA 438 Practical Translation**

★3 (*fi 6*) (either term, 3-0-0). The practice of translation in media, government, and business. Prerequisite: CHINA 302 or consent of Department.

**O CHINA 455 Topics in Taiwan Literature**

★3 (*fi 6*) (either term, 3-0-0). Readings in Taiwan literature with emphasis on tradition, theme, and technique. Readings in Chinese; lectures in English and/or Chinese. Prerequisite: CHINA 302.

**CHINA 480 Topics in Chinese Studies**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★6 of senior courses in Chinese or consent of Department.

**CHINA 490 Honors Thesis**

★3 (*fi 6*) (either term, 3-0-0).

**Graduate Courses****CHINA 500 Topics in Chinese Language**

★3 (*fi 6*) (either term, 3-0-0). A reading knowledge of Chinese is required.

<https://www.beartracks.ualberta.ca>



**CHINA 501 Methods of Research: Pre-Modern**

★3 (fi 6) (either term, 3-0-0). Sinology; historical and critical approaches to pre-modern Chinese literature. A reading knowledge of Chinese is required.

**CHINA 502 Methods of Research: Modern**

★3 (fi 6) (either term, 3-0-0). Sinology; historical and critical approaches to modern Chinese literature. A reading knowledge of Chinese is required.

**CHINA 510 Reading Tang-Song Poetry**

★3 (fi 6) (either term, 3-0-0). Conventions of writing poetry in China in contrast to those in the western world.

**CHINA 599 Topics in Chinese Literature**

★3 (fi 6) (either term, 3-0-0). Survey of major topics in Chinese literature, pre-modern and modern. CHINA 599 must be taken at least once and may be repeated for credit when course content differs. A reading knowledge of Chinese is required.

## 231.79 Christian Theology at St Joseph's College, CHRTC

St Joseph's College

**Note:** The following courses can be used as Arts options.

### Undergraduate Courses

**0 CHRTC 100 The Bible: An Introduction**

★3 (fi 6) (either term, 3-0-0). A study of the basic themes of the Christian bible; creation and covenant; sin and evil; the biblical history of ancient Israel; the prophets and justice; the preaching, death, and resurrection of Jesus Christ; redemption; the emergence of the Church.

**0 CHRTC 101 Catholic Studies: An Introduction**

★3 (fi 6) (either term, 0-3s-0). Selected themes in Western history, thought and culture as they relate to the Catholic Christian intellectual tradition.

**CHRTC 102 Interdisciplinary Seminar in Catholic Studies II**

★3 (fi 6) (second term, 0-3s-0). Critical examination and discussion of selected themes in Western history, thought and culture as they relate to the Catholic Christian intellectual tradition. Prerequisite: CHRTC 101. Note: Restricted to students enrolled in the St Joseph's College-Faculty of Arts Cohort program.

**CHRTC 201 Seminar in Applied Ethics I**

★3 (fi 6) (first term, 0-3s-0). Critical discussion and analysis of selected issues of social and professional ethics in the context of Catholic and other Christian thought and action; includes a community service learning component. Note: Restricted to students enrolled in the St Joseph's College-Faculty of Arts cohort program.

**CHRTC 202 Seminar in Applied Ethics II**

★3 (fi 6) (second term, 0-3s-0). Critical discussion and analysis of selected issues of social and professional ethics in the context of Catholic and other Christian thought and action; includes a community service learning component. Prerequisite: CHRTC 201. Note: Restricted to students enrolled in the St Joseph's College-Faculty of Arts cohort program.

**0 CHRTC 221 Interactions between Aboriginal Spiritual Traditions and Christianity**

★3 (fi 6) (either term, 3-0-0).

**0 CHRTC 250 The Theological Education of the Catholic Teacher**

★3 (fi 6) (either term, 3-0-0). The components that make up the education of the Catholic teacher. Issues include credal statements, the moral and social teachings of the Church, liturgical practices, a general theology and theory of Catholic education.

**0 CHRTC 264 Dimensions of the Christian Faith**

★3 (fi 6) (either term, 3-0-0). What is Christianity? An introduction to the major dimensions of Christianity, such as revelation, faith, Scripture, God, Jesus as Lord and Saviour, with reflection on them in light of contemporary human experience. Formerly CHRTC 364.

**0 CHRTC 266 Jesus in the New Testament**

★3 (fi 6) (either term, 3-0-0). Exploring the person of Jesus through a study of the four Gospels, Paul, and later New Testament writers.

**0 CHRTC 267 The New Testament Letters: An Introduction**

★3 (fi 6) (either term, 3-0-0). A theological and scriptural exploration of the central themes of the New Testament letters and their contemporary relevance.

**0 CHRTC 270 The Catholic Church Today**

★3 (fi 6) (either term, 3-0-0). A study of how the Catholic Church understands itself today, its relationships with other Christians and with non-Christians, and its role in the contemporary world. Formerly CHRTC 370.

**0 CHRTC 272 Catholic Moral Thought: An Introduction**

★3 (fi 6) (either term, 0-3s-0). Major themes in Catholic moral reflection with application to some contemporary issues. The meaning of morality and Christian

conversion: the role of experience, the Bible, the Church, moral norms, the development of conscience, and personal responsibility. Not open to students with credit in CHRTC 172.

**0 CHRTC 292 Spirituality for Today's Christians**

★3 (fi 6) (either term, 3-0-0). Developing an understanding of the role of prayer, leisure, and work within a Christian lifestyle in the light of Scripture, Christian tradition, current theological reflection, and personal differences.

**0 CHRTC 309 Topics in the Christian Tradition**

★3 (fi 6) (either term, 3-0-0).

**0 CHRTC 341 Contemporary Film and Christian Values**

★3 (fi 6) (either term, 3-0-0). Theological themes arising out of contemporary film. Themes may include relationships, family, gender, possessions, work freedom, violence, suffering, death, happiness, and hope.

**0 CHRTC 348 A History of Christianity in Canada**

★3 (fi 6) (either term, 3-0-0).

**0 CHRTC 349 Social Justice and Christianity in Canada**

★3 (fi 6) (either term, 3-0-0). An examination of particular social justice issues related to the economy, women, native peoples, the environment, etc., in light of Catholic social teachings and other Christian perspectives; social action strategies, and education for social justice.

**0 CHRTC 350 Science and Religion: Christian Perspectives**

★3 (fi 6) (either term, 3-0-0). An examination of relationships between science and religion. Topics may include Galileo affair, geology and Noah's flood, Darwin's religious beliefs, evolution vs creation debate, intelligent design, natural evil, interpretations of Genesis 1-11.

**0 CHRTC 351 Sex, Love and Marriage: Christian Perspectives**

★3 (fi 6) (either term, 3-0-0). Questions of meaning and morality concerning sex, love, marriage, non-marital sex, parenthood, relationship and marriage breakup, celibacy, gender, and homosexuality, considered in the light of experience, the Bible, Catholic teaching, traditional and contemporary theological discussion.

**0 CHRTC 352 Bioethical Issues: Christian Perspectives**

★3 (fi 6) (either term, 3-0-0). Reproductive and genetic technologies, abortion, transplantation, resource allocation, research, withdrawing treatment, personal directives, euthanasia, considered in light of human experience. Catholic Church teaching, other Christian perspectives and contemporary ethical discussion.

**0 CHRTC 353 Imaginative Literature: Christian Perspectives**

★3 (fi 6) (either term, 3-0-0). The context of the works and their authors, Christian content, and how the works deal with Christian values, beliefs, spirituality and conscience.

**0 CHRTC 354 The Gospels of Matthew, Mark, and Luke**

★3 (fi 6) (either term, 3-0-0). A comparison of the Gospels of Matthew, Mark, and Luke to determine their theological and pastoral orientations in proclaiming the Jesus tradition to the developing Christian communities.

**0 CHRTC 355 The Catechism of the Catholic Church: Theological Perspectives**

★3 (fi 6) (either term, 3-0-0). Scripture, the moral life, systematic theology, social teachings, catechesis, the spiritual life in the Catechism. The relationship between the Catechism and Catholic theological development.

**0 CHRTC 356 Theologies of Christian Religious Education**

★3 (fi 6) (either term, 3-0-0). Pluralism, multiculturalism, and ecumenism in relation to Christian religious education including tradition, Scripture, the Church, the person, the mission of the Church in the world, as well as the influence of the wider culture upon the development of theologies of education.

**0 CHRTC 358 The Gospel and Epistles of John**

★3 (fi 6) (either term, 3-0-0). The authorship, structure and content of the Gospel and Epistles of John, their theological and pastoral orientation and their contribution to early Christianity.

**0 CHRTC 371 The Sacraments**

★3 (fi 6) (either term, 3-0-0). The role of the sacraments in Christian life and worship. The sacraments as encounters with the divine and as community celebrations. Historical development and current understandings.

**0 CHRTC 372 The Theology and Spirituality of Eastern Christianity**

★3 (fi 6) (either term, 3-0-0). The churches of the Christian East, the Patristic era and early ecumenical councils, the schism between East and West, and contemporary Greek Catholic and Orthodox Churches with special attention to the churches in Canada.

**0 CHRTC 380 Christian Religious Education and the Child**

★3 (fi 6) (either term, 3-0-0). Key themes relevant to the faith life of children, such as: the presence of God, a sense of belonging, the need for community. Examination of selected Alberta school curriculum topics.

**0 CHRTC 381 Christian Religious Education and the Adolescent/Young Adult**

★3 (fi 6) (either term, 3-0-0). Key themes relevant to the faith search of

adolescents/young adults, such as: the life and teachings of Jesus, the challenge of the Gospel in our culture, and the meaning of belonging and commitment to Church. Examination of selected Alberta school curriculum topics.

**0 CHRTC 390 Neuroscience, the Person and Christian Theology**

★3 (fi 6) (either term, 3-0-0). Interdisciplinary study of personhood and related topics: animal/human consciousness; body/soul, mind/brain, sexuality/gender, and relationship issues; religious and mystical experiences.

**0 CHRTC 391 Women's Spirituality in Contemporary Christianity**

★3 (fi 6) (either term, 3-0-0). Women's experience of God and the Christian life expressed in the history of spirituality, personal faith development and contemporary culture.

**0 CHRTC 392 Catholicism and Popular Culture**

★3 (fi 6) (either term, 3-0-0). Examination of the relationship between Catholicism and popular culture using both historical and contemporary examples. Use by Catholics of such popular media as print, film, video, TV, music and the internet; Catholic assessments of consumer culture and the mass media.

**0 CHRTC 393 The Human Sexual Body: Theological Perspectives**

★3 (fi 6) (either term, 3-0-0). Historical and contemporary perspectives on the sexual body in Christian thought.

**0 CHRTC 394 Business Ethics: Christian Perspectives**

★3 (fi 6) (either term, 3-0-0). A theological study of ethical issues in business settings, dealing with such themes as employer-employee relations, job security, advertising, distribution of wealth, acquisitive individualism, the common good; decisions on ethical issues in light of contemporary Catholic teaching.

**0 CHRTC 396 Environmental Issues: Christian Perspectives**

★3 (fi 6) (either term, 3-0-0). Theological and ethical issues concerning our relationship to the planet earth: responsible stewardship, non-renewable resources, pollution, the use of technology.

**0 CHRTC 407 Topics in Christian Religious Education**

★3 (fi 6) (either term, 3-0-0). Prerequisite: CHRTC 380 or 381 or consent of the College.

**0 CHRTC 432 Current Theological Issues in Advanced Bioethics**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: CHRTC 352 or consent of the College.

**0 CHRTC 449 Field Placement in Christian Service**

★3 (fi 6) (either term, 0-8s-0). Supervised work experience in approved Christian social agencies with seminars and a major paper integrating the theological literature with issues raised by social action and placement experiences. Prerequisite: CHRTC 349 or consent of the College.

**0 CHRTC 450 Directed Readings in Catholic Theology**

★3 (fi 6) (either term, 3-0-0). An intensive directed readings course on a topic selected by the student in consultation with one of the faculty. A major term paper is required. Prerequisites: One course in Christian theology and permission of the College.

**0 CHRTC 451 Modern Creationisms**

★3 (fi 6) (either term, 3-0-0). Critical analysis of the creation-evolution debate in light of scientific evidence and modern biblical scholarship. Prerequisite: CHRTC 350 or consent of the College.

**CHRTC 479 Topics in Christian Theology**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: any CHRTC course or consent of the College.

## Graduate Courses

**0 CHRTC 501 Directed Reading in Catholic Theology**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of College.

**0 CHRTC 609 Topics in Christian Tradition**

★3 (fi 6) (either term, 0-3s-0).

## 231.80 Christian Theology at St Stephen's College, CHRTP

St Stephen's College

**Note:** The following courses can be used as Arts options.

## Undergraduate Courses

**0 CHRTP 301 Hebrew Scriptures Basics**

★3 (fi 6) (first term, 3-0-0). Explores basic themes and literature of the Hebrew Scriptures (Old Testament): sources and context, authorship, literary qualities, general teaching and formation.

**0 CHRTP 305 Christian Scriptures Basics**

★3 (fi 6) (second term, 3-0-0). Explores basic themes and literature of the New

Testament. Christianity's origins and the social formation of Jesus movements and Christ cults are explored in the context of the Jewish, Greek and Roman world.

**0 CHRTP 312 Questing Faith: Thinking About God**

★3 (fi 6) (first term, 0-3s-0). Explores major questions of faith: God, Christ, humanity, evil, hope. This course provides insight into the Christian faith for all interested persons.

**0 CHRTP 313 Topics in Applied Christian Ethics**

★3 (fi 6) (either term, 3-0-0). Exploration and analysis of selected issues in social ethics within the context of theological reflection and commitment. Particular attention will be paid to the development of debate within the Protestant tradition.

**0 CHRTP 314 Topics in Women and Religion**

★3 (fi 6) (either term, 3-0-0). Women's relationship to and place in Christianity is explored. Women's attempts to critique and transform received tradition and/or to develop alternative forms of religious life are examined.

**0 CHRTP 315 Exploring Faith and Fiction**

★3 (fi 6) (either term, 3-0-0). Novels chosen present us with questions of doubt and faith, spiritual journey, community.

**0 CHRTP 316 "Just" Sex: Integrating Sexuality and Spirituality**

★3 (fi 6) (second term, 2-1s-0). This course seeks to explore questions of justice in relation to sexuality and spirituality through the historical/theological aspects of our lives in light of contemporary theory and debate.

**0 CHRTP 317 New Issues in Theology**

★3 (fi 6) (either term, 3-0-0). Developments and controversies in Christian Theology and their implications for traditional beliefs, symbols, and the integration of faith and practice.

**0 CHRTP 318 Feminist Theology**

★3 (fi 6) (first term, 1-2s-0). An examination of feminist criticisms of selected doctrines and practices.

**0 CHRTP 319 Eco-Theology**

★3 (fi 6) (either term, 3-0-0). Earth's divinity is infinitely precious and endangered. Participants will reflect theologically on this great challenge of the 21st century, and discover paths by which we can "stay awake" to the call of earth.

**0 CHRTP 320 Classroom Storytelling: The Sacred in Contemporary Children's Literature**

★3 (fi 6) (either term, 3-0-0). Participants will investigate the use of contemporary children's literature as a supportive, pedagogical strategy in the development of children's spirituality.

**0 CHRTP 321 Art Therapy Fundamentals**

★3 (fi 6) (either term, 1-2s-0). Art therapy, a specialized field in counseling psychology, provides a natural vehicle for promoting integrative, holistic approach to psychological healing. Explores the theory and application of art therapy to spirituality and healing settings. This course will be experientially based, with a lecture and seminar portion.

**0 CHRTP 400 Special Topics**

★3 (fi 6) (either term, 3-0-0). Discussion of topics relevant to the theological or pastoral counselling disciplines. Credit may be obtained for this course more than once. Prerequisite: consent of the Dean of St Stephen's College.

**0 CHRTP 418 The Makers of Modern Theology**

★3 (fi 6) (either term, 0-3s-0). A study of the major works of a key theologian of the 19th or 20th century.

## 231.81 Civil Engineering, CIV E

Department of Civil and Environmental Engineering  
Faculty of Engineering

The following courses were renumbered effective 2000-2001

Old	New	Old	New
CIV E 506	CIV E 406	CIV E 540	CIV E 439
CIV E 404	CIV E 409	CIV E 574	CIV E 479
CIV E 521	CIV E 429	CIV E 591	CIV E 489

## Undergraduate Courses

**CIV E 221 Environmental Engineering Fundamentals**

★3.8 (fi 6) (second term, 3-0-3/2). Basic mechanisms of chemistry, biology, and physics relevant to environmental engineering processes. Principles of equilibrium reactions and kinetics, mass transfer and material balances, microbial growth and kinetics, water, energy, and nutrient cycles. Applications to environmental engineering systems as biological degradation, mass and energy movement through the environment, and design of water and wastewater treatment systems. Prerequisites: CHEM 103 and CHEM 105.

**CIV E 240 Technical Communications**

★2 (fi 6) (second term, 1-2s-0). Written and oral communications in civil engineering;

lectures and practice on presentation of oral and written reports, including technical proposals; progress reports; field inspection reports; consulting reports; and coverage of elements of ethics, equity, concepts of sustainable development and environmental stewardship, public and worker safety and health considerations including the context of the Alberta Occupational Health and Safety Act. Seminars and practice in developing effective search strategies for technical information. A written report must be submitted by each student.

#### **CIV E 250 Plane Surveying**

★4.5 (*fi 6*) (either term, 3-0-3). Basic surveying concepts and instrumentation, measurement errors, coordinate systems, leveling, traversing, layout surveys, earthwork volumes, conventional, and digital mapping, GIS concepts, aerial photography, and GPS. Prerequisites: MATH 101 and 102.

#### **CIV E 251 Survey School**

★1.5 (*fi 3*) (second term or Spring/Summer, 1 week). Practical exercises in field methods; project type of assignments; field astronomy; electronic distance measuring instruments. Note: Survey School is held off campus. Prerequisite: CIV E 250.

#### **CIV E 265 Engineering Drawing and Computer Graphics**

★3.5 (*fi 6*) (either term, 2-0-3). Multiview representation, pictorial views of three-dimensional objects. Computer-aided graphics using AutoCAD.

#### **CIV E 270 Mechanics of Deformable Bodies I**

★4.5 (*fi 6*) (either term, 3-0-3). Plane stress and strain; stress-strain relationships; stresses and deformations resulting from axial and transverse loads; buckling of columns; torsion of circular sections; combined stress; statically indeterminate problems. Laboratory to demonstrate mechanical properties and verify assumptions of analysis. Prerequisites: ENGG 130 and MATH 101.

#### **CIV E 290 Civil Engineering Analysis I**

★3 (*fi 6*) (second term, 3-0-0). Statistical and probabilistic approaches to civil engineering problems. Prerequisite: MATH 101.

#### **CIV E 295 Civil Engineering Analysis II**

★4 (*fi 6*) (second term, 3-0-2). Application of numerical methods to civil engineering problems. Prerequisites: ENCMP 100 and MATH 102. Corequisite: MATH 201.

#### **CIV E 303 Project Management**

★3.8 (*fi 6*) (either term, 3-0-3/2). Planning and scheduling; theories and techniques of project management.

#### **CIV E 315 Transportation Engineering**

★4 (*fi 6*) (either term, 3-0-2). Transportation systems and their elements. Principles of transportation planning. Traffic volume, capacity, speed, density, and safety. Fundamentals of traffic control. Principles of highway planning. Highway and terrain. Vehicular motion. Horizontal and vertical geometric design. Cost/benefit analysis in highway design. Earthwork and mass diagram. Flexible and rigid pavement design. Prerequisite: CIV E 250.

#### **CIV E 321 Principles of Environmental Modeling and Risk**

★3.8 (*fi 6*) (either term, 3-0-3/2). Introduction modeling environmental processes to predict the movement of water and fate of contaminants in the hydrologic cycle. Principles of mass transfer, conservation of mass, environmental transformations, nutrient enrichment and depletion are developed. Introduction to storm events, rainfall, runoff, stream discharge and stormwater management. Applications of modeling results to the quantification of risk using examples from hydrology, water pollution and health protection and development of environmental regulations. Prerequisite: CIV E 221. Corequisite: CIV E 330.

#### **CIV E 330 Introduction to Fluid Mechanics**

★3.5 (*fi 6*) (either term, 3-1s-0). Fluid properties; dimensional analysis; hydrostatics; fundamental equations of fluid motion; laminar, turbulent and inviscid flows; boundary layers and flow around immersed bodies; elementary building aerodynamics. Prerequisites: MATH 201 and 209.

#### **CIV E 331 Applied Hydraulics**

★3.8 (*fi 6*) (either term, 3-0-3/2). Introduction to applied hydraulics; control volume methods, open channel hydraulics, pipe systems, pumps, distribution and collection system hydraulics and design. Prerequisite: CIV E 330. Corequisite: either CIV E 221 or ENV E 222.

#### **CIV E 372 Structural Analysis I**

★4 (*fi 6*) (either term, 3-2s-0). Introduction to structural loads; deformations of statically determinate beams, trusses and frames; influence lines; analysis of statically indeterminate structures by consistent deformations, slope deflection and moment distribution; direct stiffness analysis. Prerequisite: CIV E 270.

#### **CIV E 374 Structural Design I**

★4.5 (*fi 6*) (either term, 3-0-3). Introduction to limit states design. Behavior and design of steel and reinforced concrete members. Prerequisite: CIV E 372.

#### **CIV E 381 Soil Mechanics**

★4.5 (*fi 6*) (either term, 3-0-3). Compaction; site investigation; theories of water seepage; effective stress principles; settlement; strength and mechanical properties; introduction to retaining structures, foundation, and slope stability. Prerequisite: EAS 210.

#### **CIV E 391 Civil Engineering Materials**

★4.5 (*fi 6*) (either term, 3-0-3). Classification of soils. Properties of Portland cement concrete related to micro- and macro-structure and constituent materials. Properties of bituminous materials and design of bituminous mixes. Prerequisite: MAT E 202 or ENV E 220.

#### **CIV E 395 Civil Engineering Analysis III**

★3.5 (*fi 6*) (either term, 3-0-2/2). The formulation of partial differential equations for modeling civil engineering problems. Introduction to analytical and numerical solution techniques. Prerequisites: MATH 209 and CIV E 295.

#### **CIV E 398 Introduction to Continuum Mechanics**

★3.5 (*fi 6*) (first term, 3-1s-0). Stress, strain and displacements in two and three dimensions. Constitutive equations. Governing equations of elasticity and simple solutions. Strain energy and virtual work. Theories of failure. Prerequisites: CIV E 270 and MATH 209.

#### **CIV E 406 Construction Estimating, Planning, and Control**

★3.8 (*fi 6*) (either term, 3-0-3/2). Introduction to elements of construction, planning, scheduling, and cost estimating. Familiarization with quantity take-off, estimate preparation, cost recovery, resource allocation, project scheduling, risk analysis, and bid preparation. Prerequisite: CIV E 303.

#### **CIV E 409 Construction Methods**

★4.5 (*fi 6*) (either term, 3-0-3). Principles of building, heavy and bridge construction; wood and formwork design, stability during construction, economics of equipment selection, movement of material on construction sites, safety, and constructability issues. Students work in teams on a design project. Prerequisites: CIV E 303 and 372.

#### **CIV E 411 Transportation Engineering II**

★3.8 (*fi 6*) (first term, 3-0-3/2). Traffic operations and network analysis, traffic stream flow and roadway analysis, weaving and interchange ramp analysis, intersection traffic control measures and control design, progressive signal system design, traffic flow prediction, road network simulation and assignment algorithms, motor vehicle accident analysis; and field data collection method. Prerequisite: CIV E 315.

#### **CIV E 419 Transportation Engineering: Planning and Design**

★4.5 (*fi 6*) (second term, 3-0-3). Planning and design of various transportation systems, including development, planning process, data collection, finances, procedures for future developments, evaluation of transportation plans, and design of land, air and water transportation facilities (e.g. highways, railways, runways, pipelines, terminals, harbors, ports, and lighting for these areas). Students work in teams on a design project. Prerequisite: CIV E 411.

#### **CIV E 429 Environmental Engineering Design**

★4.5 (*fi 6*) (second term, 3-0-3). Fundamentals of municipal design, planning and environmental impact assessment; detailed design and assessment projects; reports; presentation; field trips. Students work in teams on a design project. Prerequisites: CIV E 321 and either CIV E 421 or ENV E 421.

#### **CIV E 431 Water Resources Engineering**

★3.8 (*fi 6*) (either term, 3-0-3/2). Hydrotechnical analysis, including: advanced open channel hydraulics; advanced surface water hydrology; groundwater and well hydraulics; and environmental hydraulics. Prerequisites: CIV E 321, 331. Credit cannot be obtained in this course if credit has already been obtained in CIV E 433.

#### **CIV E 439 Water Resources Engineering Design**

★4.5 (*fi 6*) (second term, 3-0-3). Design of hydraulic structures and river engineering works, including: dams, spillways, energy dissipators, bridges, culverts, erosion protection and river training works. Students work in teams on a design project. Prerequisite: CIV E 431.

#### **CIV E 459 Biomedical Engineering Design**

★4.5 (*fi 6*) (second term, 3-0-3). Application of civil and mechanical engineering principles to different topics in biomechanical engineering design. Topics may include: experimental tissues, bone engineering, computational biomechanics, numerical modeling for different mechanical and biological processes. Students work in teams on a design project. Prerequisite: consent of Department.

#### **CIV E 474 Structural Design II**

★3.8 (*fi 6*) (either term, 3-0-3/2). Behavior and design of steel and reinforced concrete structures. This course builds on the material presented in CIV E 374 and places greater emphasis on the behavior of overall structures. Prerequisite: CIV E 374.

#### **CIV E 479 Structural Design III**

★4.5 (*fi 6*) (second term, 3-0-3). Design of prestressed concrete structures; masonry and reinforced masonry elements; timber structures; fatigue life of steel structures and cold formed steel elements. Students work in teams on a design project. Prerequisite: CIV E 474.

#### **CIV E 481 Soil Engineering**

★3.8 (*fi 6*) (either term, 3-0-3/2). Site investigation; strength of soils; geosynthetics for soil improvement; design of excavations and earth pressures on retaining structures; stability of natural slopes and their improvement; design of cuts and



embankments; foundation design, stability and settlement; pile foundations; frost action and permafrost. Prerequisite: CIV E 381.

#### **CIV E 489 Geotechnical Design**

★4.5 (fi 6) (second term, 3-0-3). Evaluation of site conditions. Design and analysis of shallow and deep foundations and retaining structures. Slope stability of embankments and cuts including foundation excavations. Students work in teams on a design project. Prerequisite: CIV E 481.

#### **CIV E 499 Special Topics in Civil Engineering Design**

★4.5 (fi 6) (either term, 3-0-3).

### **Graduate Courses**

#### **CIV E 558 Air Quality Assessment**

★3 (fi 6) (first term, 3-0-0). Overview of air quality regulations. Sources of air pollutants, air quality meteorology, and air quality modeling. General principles of air pollutants sampling and its application to particle and gas sampling. Corequisite: ENV E 323.

#### **CIV E 601 Project Management**

★3 (fi 6) (either term, 3-0-0). Overview of project management for capital construction projects. Emphasis on planning and scheduling, including linear scheduling, project control, value engineering, and constructability.

#### **CIV E 602 Contract Administration**

★3 (fi 6) (either term, 3-0-0). Construction project and contract administration; budgeting, costing and financial project control; delivery systems; labour relations; safety.

#### **CIV E 603 Computer Applications and Information Management in Construction**

★4.5 (fi 6) (either term, 3-0-3). Computer-aided information management in construction, including relational database development and management, application of artificial neural networks, and application of computers in the planning, organization and control of construction projects.

#### **CIV E 604 Construction Law**

★3 (fi 6) (either term, 3-0-0). Covers fundamentals of construction law; overview of the Canadian Legal System, business organization. Tort liability, construction contracts, agreements. Lien legislation, statutes governing the engineering profession and other legal topics.

#### **CIV E 605 Decision Support Systems in Construction**

★3 (fi 6) (either term, 3-0-0). Development of decision support systems for construction project planning and control. Explores techniques of automated data acquisition, expert systems, utility theory, multi-attribute decision-making and fuzzy logic. Development of practical applications in construction.

#### **CIV E 606 Design and Analysis of Construction Operations**

★3 (fi 6) (either term, 3-0-0). Overview of production management in construction. Techniques for modeling construction operations, design of efficient processes, measurement and improvement of productivity. Computer simulation techniques for modeling and analysis.

#### **CIV E 607 Work Improvement Studies**

★3 (fi 6) (either term, 3-0-0). Planning for productivity improvement, work measurement technique, data analysis and evaluation, human behavior as a factor in construction productivity, safety in productivity improvement, computer and other tools for productivity improvement.

#### **CIV E 608 Construction Engineering**

★3.8 (fi 6) (either term, 3-0-3/2). Introduction to the elements and methods of construction and principles of material handling on construction projects. Winter construction, dewatering, earthmoving and earthworks, concrete processes, building systems and lifting. Site tours.

#### **CIV E 612 Transportation Planning: Methodology and Techniques**

★3 (fi 6) (either term, 3-0-0). Introduction and overview of transportation planning. Institutional framework of transportation planning. Characteristics of urban travel, trip generation, trip distribution, mode choice, trip assignment, urban activity system. Transportation supply, transportation system impact analysis, evaluation process and methods. Prerequisite: consent of instructor.

#### **CIV E 613 Transportation Demand and Policy Analysis**

★3 (fi 6) (either term, 3-0-0). Microeconomic principles of consumer behaviour, parameter estimation techniques, disaggregate econometric choice theory, modelling transportation decisions, sampling and data preparation, interpretations/evaluation. Prerequisite: consent of instructor.

#### **CIV E 614 Traffic Operation and Control**

★3 (fi 6) (either term, 3-0-0). Human factors, traffic control devices, signal warrants, principles of signalized intersections, signal timing, signal optimization and coordination, capacity, traffic delay, left turn, diamond interchange, unsignalized intersection, roundabouts, actuated control, incident management, freeway control.

#### **CIV E 615 Traffic Flow and Network Modeling**

★3 (fi 6) (either term, 3-0-0). Traffic flow stream characteristics, car following

model, continuum flow model, fundamental diagram, microscopic traffic simulation, macroscopic traffic flow modeling, model parameter calibration, route choice concept and model, static traffic network modeling, dynamic traffic network modeling.

#### **CIV E 618 Pavement Management Systems**

★3 (fi 6) (either term, 3-0-0). Introduction to pavement management, network and project level management, data collection and management, pavement evaluation, pavement design, rehabilitation and maintenance, pavement performance models, life cycle analysis, implementation of pavement management systems, future directions and research needs.

#### **CIV E 620 Environmental Engineering Measurements I**

★4.5 (fi 6) (either term, 3-0-3). Theory and procedures for determining the quality of natural water, potable water, municipal and industrial wastes. Fundamental parameters and concepts for environmental quality evaluation.

#### **CIV E 622 Physical/Chemical Water and Wastewater Treatment**

★3 (fi 6) (either term, 3-0-0). Theory and design of chemical and physical unit processes utilized in the treatment of water and wastewater, sedimentation, flocculation, coagulation, precipitation, filtration, disinfection, ion exchange, reverse osmosis, adsorption, and gas transfer.

#### **CIV E 623 Industrial Water and Wastewater Management**

★3 (fi 6) (either term, 3-0-0). Industrial water quantity and quality requirements. Characteristics of wastes, inplant controls, product recovery; effluent characteristics, chemical and toxic properties, pretreatment and treatment design theory and methodology, water reclamation and reuse regulations.

#### **CIV E 624 Biological Waste Treatment Processes**

★3 (fi 6) (either term, 3-0-0). Study of the theoretical and applied aspects of wastewater treatment by activated sludge, fixed and moving biological films, conventional and aerated lagoons, sludge digestion, septic tanks, land treatment, and nutrient removal. Guidelines, regulations and economics. System analysis and design of facilities.

#### **CIV E 625 Engineering Management of Water Quality**

★3 (fi 6) (either term, 3-0-0). Concepts, rationale, theory, institutions and engineering aspects of water quality management. Methods of water quality management; oxygen; chemical and microbial models, natural and induced re-aeration techniques; thermal pollution and ice cover considerations.

#### **CIV E 627 Environmental Engineering Measurements II**

★3 (fi 6) (either term, 1-0-4). Laboratory experiments to present techniques for obtaining data and relationships needed for design of treatment facilities. Analytical approaches, data interpretation, presentation and design methods. Applications of experimental design principles.

#### **CIV E 628 Municipal Solid Waste Management**

★3 (fi 6) (either term, 3-0-0). Principles of municipal waste management to protect public health, municipal waste streams, waste stream analysis and prediction. Refuse collection, storage and hauling methods, and facilities. Engineering design and operation of solid waste processing, treatment and disposal methods: resource recovery, recycling programs, incineration, composting, landfilling, and novel techniques. Solid waste legislation and policies. Environment impacts, impact management and facility siting of waste facilities.

#### **CIV E 629 Artificial Neural Network Applications in Environmental Engineering**

★3 (fi 6) (either term, 3-0-0). Modeling of non-linear systems with specific applications of Artificial Neural Network modeling to describe the behaviour of complex environmental systems. Applications may include full-scale water treatment systems; full-scale wastewater treatment systems; atmospheric and indoor air quality; river and lake system water quality; and urban and rural surface runoff quantity and quality.

#### **CIV E 631 Engineering Fluid Mechanics**

★3.5 (fi 6) (either term, 3-0-1). Navier-Stokes equations and viscous flow. Turbulence and Reynolds equations. Potential flow. Boundary layers. Flow around bodies. Jets and wakes. Related Lab experiments.

#### **CIV E 632 Hydraulic Structures**

★3.5 (fi 6) (either term, 3-0-1). Hydraulic design of water-handling structures used for extraction, retention, conveyance, control, regulation, energy dissipation, drainage, navigation, flood controls and other civil engineering schemes. Related Lab experiments.

#### **CIV E 634 Numerical Methods in Hydraulics**

★3 (fi 6) (either term, 3-0-0). Review of numerical methods for solution of linear and nonlinear systems of algebraic and ordinary differential equations. Finite difference, finite volume and finite element methods for partial differential equations with an emphasis on convection dominated transport equation problems. Stability and accuracy analysis of numerical methods.

#### **CIV E 635 Advanced Environmental Fluid Mechanics**

★3.5 (fi 6) (either term, 3-0-1). Mixing processes and pollutant transport in rivers, lakes, estuaries, coastal waters, and the atmosphere. Prerequisite: CIV E 631. Related Lab experiments.

**CIV E 636 Ice Engineering**

★3.5 (fi 6) (either term, 3-0-1). Elementary heat transfer analysis. Ice formation processes. Ice hydraulics. Ice mechanics. Interaction of ice and engineering structures.

**CIV E 638 Experimental Fluid Mechanics**

★3.5 (fi 6) (either term, 3-0-1). Methods used for the measurement and analysis of data in fluid mechanics experiments. Topics covered will include: dimensional analysis and similitude; digital data acquisition, digital signal processing, spectral analysis, error analysis, surface wave height and slope measurements; laser-Doppler velocimetry, acoustic-Doppler velocimetry, particle-image velocimetry, high speed video and flow visualization.

**CIV E 639 Computational Hydraulics**

★3 (fi 6) (either term, 3-0-1). Application of computational methods to problems in Hydraulic Engineering, including: transient pipe and open channel flow, two-dimensional shallow water flow, and contaminant and sediment transport. Introduction to computational fluid dynamics. Recommended Prerequisite: CIV E 634 or consent of the instructor.

**CIV E 640 River Engineering**

★3.5 (fi 6) (either term, 3-0-1). Flow and sediment transport in alluvial channels; engineering geomorphology; river ecology; design of river engineering installations.

**CIV E 641 Advanced Surface Water Hydrology**

★3 (fi 6) (either term, 3-0-0). Precipitation, evaporation, infiltration. Streamflow and hydrograph analysis. Hydrologic systems. Hydrologic routing. Simulation models. Statistical methods.

**CIV E 645 Water Resources Planning and Management**

★3.5 (fi 6) (either term, 3-0-1). Systems concept on the planning and management of water resources systems. Engineering economics and economic theories. Evaluate and optimize the design and operations of water resources systems using Linear Programming, chance-constrained Linear Programming, Dynamic Programming, Stochastic Dynamic Programming, constrained and unconstrained nonlinear programming. Optimal sizing and operations of reservoir systems and hydropower using HEC5 and urban stormwater management system.

**CIV E 646 Modelling Water Quantity and Quality Using Satellite Data and GIS**

★3 (fi 6) (either term, 3-0-0). Electromagnetic theory and practices of remote sensing and GIS for mapping/modeling the water quantity and quality of the earth's environment; digital image analysis of satellite data in the visible, NIR, IR and microwave bands, raster and vector GIS, and example applications in water quality, surface soil moisture, snow hydrology and hydrologic modeling.

**CIV E 653 Readings in Project Management**

★3 (fi 6) (either term, 3-0-0). Management of construction projects: organizational issues, advanced time management, total quality management, materials management, change control and management of change.

**CIV E 654 Artificial Intelligence and Automation in Construction**

★3 (fi 6) (either term, 3-0-0). Prototyping techniques applied to the design and development of systems based on artificial intelligence techniques for use in construction.

**CIV E 656 Environmental Engineering Assessment and Management**

★3 (fi 6) (either term, 3-0-0). Review of EIA basics: definitions, cause-effect mechanisms, description of engineered activities and baselines, environmental impact predictions, testing and monitoring of effects, project evaluation and decision making for engineering design, and impact management of engineered facilities. Environmental management plans and audits, communication with stakeholders, and review of projects. Prerequisites: CIV E 620 and 622.

**CIV E 657 Air Pollution Control**

★3 (fi 6) (first term, 3-0-0). Overview of air quality regulations. Overview of fundamental principles in air quality engineering. Theory and application of processes for gaseous and particulate pollutants control, including incineration, adsorption, absorption, biofiltration, cyclonic separation, electrostatic precipitation, filtration, and scrubbing. Special applications may include the control of sulfur dioxide, nitrogen oxides, volatile organic compounds, and mobile/automotive emissions.

**CIV E 658 Design of Civil Engineering Experiments**

★3 (fi 6) (either term, 3-0-0). Introduction to experimental design; design of experiments in environmental, transportation, and other civil engineering specialty areas; analysis of experimental and survey data.

**CIV E 660 Advanced Structural Analysis**

★3 (fi 6) (either term, 3-0-0). Direct stiffness theory and modeling of three dimensional framed structures. Linear and nonlinear stability concepts. Approximate and Direct stiffness formulation of geometric nonlinear problems.

**CIV E 661 Dynamics of Structures**

★3 (fi 6) (either term, 3-0-0). Dynamics of single and multiple degree of freedom systems. Time step methods. Modal and response spectrum analysis for earthquake loading. Random vibration analysis. Dynamic wind loading analysis. Dynamics of foundations.

**CIV E 664 Introduction to Solid Mechanics**

★3 (fi 6) (either term, 3-0-0). Formulation of basic equations of elasticity in solid mechanics. Cartesian tensor notation. Variational principles.

**CIV E 665 Introduction to the Finite Element Method**

★3 (fi 6) (either term, 3-0-0). Fundamentals of the formulation and application of the finite element method to problems of continuum mechanics, with special reference to civil engineering, including problems in solid mechanics and soil mechanics. Prerequisite: CIV E 664 or consent of Instructor.

**CIV E 666 Structural Concepts**

★4 (fi 6) (either term, 3-1s-1). Causes and characteristics of loads on buildings, bridges and other structures. Reasons for and calculations of load and resistance factors.

**CIV E 670 Behavior and Design of Steel Members**

★4 (fi 6) (either term, 3-1s-1). Material properties and plate-buckling problems. Behavior and design of steel tension and compression members, beams and beam-columns. Behavior and design of welded and bolted connections. This course is designed to give the student an understanding of the individual members which form the steel structure.

**CIV E 671 Behavior and Design of Steel Structures**

★3 (fi 6) (either term, 3-0-0). Brittle fracture and fatigue problems. Behavior and design of composite beams and plate girders. Discussion of frame behavior; overall buckling and instability concepts as related to the design of columns and bracing systems. This course is designed to build on the material contained in CIV E 670 and to give the student an insight into the behavior of the total structure.

**CIV E 672 Behavior and Design of Concrete Members**

★4 (fi 6) (either term, 3-1s-1). Strength and behavior of simple reinforced concrete members. Relation between results of research and current design specifications. Material properties. Members subjected to flexure, axial compression, combined flexure and axial load, combined flexure and shear, torsion.

**CIV E 673 Behavior and Design of Concrete Structures**

★3 (fi 6) (either term, 3-0-0). Strength and behavior of statically indeterminate reinforced concrete structures. Elastic and limit analysis and design considerations for continuous slab systems, frames and shear walls.

**CIV E 674 Behavior and Design of Prestressed Concrete Structures**

★3 (fi 6) (either term, 3-0-0). (Offered alternate years.) Principles and methods of prestressing. Service load design and analysis. Behavior and strength design. Losses in prestress and anchorage zone stresses. Continuous beams and slabs. Discussion of design specifications.

**CIV E 676 Behavior and Design of Masonry Structures**

★3 (fi 6) (either term, 3-0-0). (Offered alternate years.) Historical developments. Masonry units, mortars and grouts. Behavior, strength and stability of masonry under axial compression. Reinforced masonry in bending and combined axial load and bending. Ductility and joint control. Design application including discussion of code requirements.

**CIV E 677 Behavior and Design of Cold-Formed Steel Structures**

★3 (fi 6) (either term, 3-0-0). General design considerations, cold forming effects, effective width method, behavior and design of tension members, beam-columns, and connections. Behavior and design of light gage steel diaphragms, composite steel decks, and industrial steel building design.

**CIV E 680 Engineering Properties of Soils**

★4 (fi 6) (first term, 3-1s-1). Principle of effective stress, clay-water systems, soil compressibility and theories of consolidation. Pore pressure parameters. Strength of granular and cohesive media. Anisotropy of soils. Laboratory measurement of strength and deformation properties. Stress-strain relations.

**CIV E 681 Seepage and Drainage**

★4 (fi 6) (first term, 3-1s-1). Elements of hydrogeology; regional groundwater flow, borehole logging methods. Theory of groundwater flow through soils and rocks, permeability, Darcy's law, field governing equations and their solution by approximate methods, finite difference and finite element methods, unsaturated flow. Civil engineering applications, seepage in earth structures, design of dewatering systems for excavations and slopes, field testing, grouting.

**CIV E 682 Environmental Geotechnics**

★3.5 (fi 6) (either term, 3-0-1). Environmental laws and regulatory processes; geotechnical characterization for environmental problems; transfer processes; elements of groundwater contaminants, geotechnical aspects of waste management; mine waste; dumps and tailings dams; design of landfills; in-situ characterization; site remediations; geotechnical aspects of nuclear waste storage.

**CIV E 683 Site Investigation Practice**

★3 (fi 6) (first term, 3-0-0). Techniques of site investigation for geotechnical engineering, in situ testing, instrumentation for field performance studies, case histories covering both rock and soil applications.

**CIV E 684 Engineering Geology and Terrain Analysis**

★4 (fi 6) (second term, 3-1s-1). Information sources in engineering geology and terrain analysis, elements of the geology of sediments and glacial geology.

Glacial and periglacial land forms. Photogeology and airphoto interpretation applied to geotechnical engineering. Case histories based on specific materials and regional problems.

#### **CIV E 685 Applied Environmental Geochemistry**

★4.5 (fi 6) (either term, 3-0-3). Geochemical processes in groundwater and mineral-water-atmosphere interaction related to petroleum, mining and agricultural wastes. Develop concepts in thermodynamic equilibrium chemistry, carbonate and nitrogen chemistry, sorption and exchange reactions, oxidation-reduction reactions and iron-sulphur geochemistry. Computation methods in geochemical modeling (PHREEQC), speciation prediction, reaction path modeling, groundwater mixing and reactive transport analysis. Techniques in environmental soil, groundwater, surface water sampling and field screening methods. Introduction to analytical testing methods for organic and inorganic chemicals and the assessment and interpretation of analytical testing results. Prerequisites: University level basic chemistry course, introductory computer course and introductory geology/mineralogy course.

#### **CIV E 687 Rock Engineering for Near Surface Structures**

★3 (fi 6) (second term, 3-0-0). Deterministic and probabilistic design methods for rock slopes and foundations on rocks. Economic, operational and geological factors affecting design. Support and stabilization techniques, excavation methods, monitoring structures in and on rock, foundations for dams and for large loads.

#### **CIV E 690 Advanced Foundation Engineering**

★4 (fi 6) (either term, 3-1s-1). Theories of lateral pressures. Limit equilibrium methods, elasticity methods, semi-empirical methods. Soil anchors. Design of retaining walls and strutted excavations. Bearing capacity of shallow and deep foundations. Allowable settlement of structures. Analysis of settlement of shallow and deep foundations. Behavior of pile groups. Design problems in foundation engineering.

#### **CIV E 692 Tunnelling**

★3.5 (fi 6) (second term, 3-1s-0). Methods of tunnelling, including excavation methods and support techniques, ground response, in situ and induced stress field, displacement field around deep and near surface tunnels, ground-support interaction, design criteria for tunnels in soil and rock, shaft design, site investigation practice and monitoring of tunnels.

#### **CIV E 694 Permafrost Engineering**

★3 (fi 6) (either term, 3-0-0). Implications for northern development, extent, engineering classification, thermal regime, ground ice, genesis, site investigations, heat conduction in the ground, properties of frozen soil, thaw consolidation, freezing mechanisms, foundations in frozen ground; slope stability, highways and airfields, pipelines and earth dams in arctic and sub-arctic regions. Prerequisite: CIV E 481 or consent of Department.

#### **CIV E 695 Soil Structures**

★4 (fi 6) (second term, 3-1s-1). Stresses in slopes. Limit equilibrium methods of analysis. Landslides in soil. Design of earth dams and embankments. Case histories of earth and rockfill dams. Dam foundations. Soft ground tunnelling.

#### **CIV E 697 Rock Engineering**

★4 (fi 6) (first term, 3-1s-1). Elements of structural geology, analysis of the geometry of rock defects, properties of intact rocks. Properties of rock masses and stresses in rock masses, stability of rock slopes. Rock foundations and underground excavations in rock. Case studies.

#### **CIV E 698 Petroleum Geomechanics**

★3 (fi 6) (either term, 3-0-0). Application geotechnical engineering principles to petroleum engineering problems. Principles of thermo-poroelasticity are reviewed. Borehole stability, hydraulic fracturing, subsidence/heave, sand production, formation damage and reservoir-geomechanical modelling are the major topics for the course. Special attention is given to geomechanical influences on reservoir flow processes. Prerequisite: consent of Instructor.

#### **CIV E 699 Numerical Methods in Geotechnical Engineering**

★3 (fi 6) (either term, 3-0-0). Techniques and procedures in geotechnical analysis. Geotechnical analysis using commercial computer packages. Nonlinear (material and geometric) finite element methods, advanced constitutive modeling for geotechnical materials, mixed, hybrid and weighted residual formulations, coupled flow/deformation finite element formulation, finite difference and boundary element methods. Other special topics include fracture/shear bank modeling, rock joint modeling and discrete element modeling. Prerequisite: CIV E 664 and CIV E 665 or permission of Instructor.

#### **CIV E 709 Advanced Topics in Construction Engineering and Management**

★3 (fi 6) (either term, 3-0-0).

#### **CIV E 719 Advanced Topics in Transportation and Engineering**

★3 (fi 6) (either term, 3-0-0). Prerequisites: permission of Department or Instructor. In this course various advanced topics on transportation engineering and planning will be taught. Some possible advanced topics are: advanced probability theory, traffic safety, travel survey method, ITS technology, advanced network analysis, travel behaviour analysis, integrated land use and transportation modelling, public

transportation planning and designing, freight transportation, transportation logistics and operation research. New topics may be added later by the Instructors.

#### **CIV E 728 Water and Wastewater Treatment**

★3 (fi 6) (either term, 3-0-0). Theory, design and application of new or alternative processes for treatment of water and wastewater, including ozone, chlorine dioxide, ultraviolet radiation, advanced oxidation, membrane and others.

#### **CIV E 729 Advanced Topics in Environmental Engineering**

★3 (fi 6) (either term, 3-0-0).

#### **CIV E 739 Advanced Topics in Fluid Mechanics and Hydraulics**

★3 (fi 6) (either term, 3-0-0).

#### **CIV E 749 Advanced Topics in Water Resources Engineering**

★3.5 (fi 6) (either term, 3-0-1). Related Lab experiments.

#### **CIV E 779 Advanced Topics in Structural Engineering**

★3 (fi 6) (either term, 3-0-0).

#### **CIV E 799 Advanced Topics in Soil Mechanics**

★3 (fi 6) (either term, 3-0-0).

#### **CIV E 900 Directed Research Project**

★3 (fi 6) (variable, unassigned). An engineering project for students registered in a Masters of Engineering program.

#### **CIV E 910 Directed Research**

★6 (fi 12) (variable, unassigned). An engineering project for students registered in the joint MBA/MEng program.

## 231.82 Classics, CLASS

Department of History and Classics  
Faculty of Arts

#### **Notes**

- (1) None of the courses under this heading will fulfil the language other than English requirements for the Faculty of Arts.
- (2) Courses under this heading from 100-400 level may be taken by students with no knowledge of Greek or Latin. Knowledge of Greek or Latin may be required at the 500-level.
- (3) The 100-level courses provide the broadest introduction to Classics, while the 200-level courses are overviews of specific areas within Classics. The 300-level courses build upon the 200-level courses and have suitable prerequisites. Note: Some 300-level courses do not have a specific topic and the details of the topic to be offered in any given year can be obtained from the Department.
- (4) All 400-level courses under this heading have a prerequisite of at least one senior level Classics, Greek, or Latin course.
- (5) The courses numbered 460 through the 500-level are designed for Classics majors, honors, and graduate students. Because precise topics in any given course may vary from year to year, students' interests are taken into account. For additional related courses see Greek (GREEK) and Latin (LATIN) listings.

### Undergraduate Courses

#### **0 CLASS 102 Greek and Roman Mythology**

★3 (fi 6) (either term, 3-0-0). A survey of classical mythology with readings in translation from various ancient authors as well as from modern scholarly works.

#### **CLASS 103 Introduction to Ancient Greece**

★3 (fi 6) (either term, 3-0-0). Formerly CLASS 270.

#### **CLASS 104 Introduction to Ancient Rome**

★3 (fi 6) (either term, 3-0-0). Formerly CLASS 271.

#### **0 CLASS 110 The Ancient World**

★3 (fi 6) (either term, 3-0-0). World history from the beginning of written records down to the sixth century AD. The course covers the ancient history of the Mediterranean world, with particular emphasis on Egypt, Greece and Rome and compares developments in civilization in these areas with those in Persia, India, China and Japan.

#### **1 CLASS 221 Literature of Greece and Rome**

★3 (fi 6) (either term, 3-0-0). An introductory survey in English translation of major works from Greek and Latin literature. This will include epic, lyric, and drama. May not be taken concurrently with or subsequent to CLASS 321/322.

#### **CLASS 254 Introduction to Greek Art and Archaeology**

★3 (fi 6) (either term, 3-0-0). Survey of the art, artifacts, and monuments of the Ancient Greek World. Formerly CLASS 252.

#### **CLASS 255 Introduction to Roman Art and Archaeology**

★3 (fi 6) (either term, 3-0-0). Survey of the art, artifacts, and monuments of the Ancient Roman World. Formerly CLASS 252.



**L CLASS 261 Women in the Ancient World**

★3 (fi 6) (either term, 3-0-0). An introduction to the role of women in the Ancient World as approached through the study of literature, law, religion, and art.

**CLASS 280 Introduction to Ancient Greek History**

★3 (fi 6) (either term, 3-0-0). Not open to students with credit in any two of CLASS 371, 372, and 373.

**CLASS 282 Introductory Roman History I**

★3 (fi 6) (either term, 3-0-0). From the foundation of the city to the fall of the Republic. Not open to students with credit in CLASS 281, 365 or 366.

**CLASS 283 Introductory Roman History II**

★3 (fi 6) (either term, 3-0-0). The Roman Empire to the late fifth century. Not open to students with credit in CLASS 281, 378 or 379.

**L CLASS 294 Ancient Science, Technology, and Medicine**

★3 (fi 6) (either term, 3-0-0). An introduction to the development of science, technology, and medicine in the ancient world with particular reference to the civilizations of Greece and Rome.

**L CLASS 302 Classical Myth and Religion**

★3 (fi 6) (either term, 3-0-0). The background and origin of classical mythology and religion; Mycenaean and Near Eastern sources; religious festivals and usages and modern scholarship. Prerequisite: CLASS 102 or consent of Department.

**CLASS 303 Religion in Greco-Roman Antiquity**

★3 (fi 6) (either term, 3-0-0). Examination of the nature of pre-Christian religious practices in antiquity.

**O CLASS 321 Literature and Culture of the Greek World**

★3 (fi 6) (either term, 3-0-0). Representative works of Greek literature and their cultural context. All readings in English. Prerequisite: CLASS 102, 221 or consent of Department.

**O CLASS 322 Literature and Culture of the Roman World**

★3 (fi 6) (either term, 3-0-0). Representative works of Latin and Greek literature and their cultural context. All readings in English. Prerequisite: CLASS 102, 221 or consent of Department.

**L CLASS 354 Topics in Greek Civilization**

★3 (fi 6) (either term, 3-0-0). Examination of one aspect of the Classical Greek World. (Emphasis in any one year may be archaeological, historical or literary). Prerequisites: CLASS 254 or 280.

**L CLASS 355 Topics in Roman Civilization**

★3 (fi 6) (either term, 3-0-0). Examination of one aspect of the Classical Roman World. (Emphasis in any one year may be archaeological, historical or literary). Prerequisites: CLASS 255, 282 or 283.

**L CLASS 356 Topics in Ancient Art**

★3 (fi 6) (either term, 3-0-0). Examination of one aspect of art in the Greco-Roman world. Prerequisites: CLASS 254 or 255.

**O CLASS 358 Topics in the Methodology, Theory and Practice of Classical Archaeology**

★3 (fi 6) (either term, 3-0-0). Prerequisites: CLASS 254 or 255.

**CLASS 360 Ancient Historiography**

★3 (fi 6) (either term, 3-0-0). Examination of the development of history writing in Classical Antiquity. Prerequisite: CLASS 280, 282 or 283.

**L CLASS 375 History of Medicine in the Ancient World**

★3 (fi 6) (either term, 3-0-0). A survey of medical science from Prehistoric times through Egyptian, Mesopotamian, Greek, and Roman times to the end of the Roman Empire.

**L CLASS 376 Early Civilization I**

★3 (fi 6) (either term, 3-0-0). A survey of the beginnings and development of civilization in the Near East, including Sumer, Babylon, Assyria, and the Hebrews. Note: not open to students with credit in RELIG 305.

**L CLASS 377 Early Civilization II**

★3 (fi 6) (either term, 3-0-0). The development of civilization in the western half of the Fertile Crescent, including the rise and decline of the Egyptian, Hittite, and Phoenician cultures.

**L CLASS 380 History of Palestine**

★3 (fi 6) (either term, 3-0-0). From the Persian Conquest to the time of Jesus. Note: not open to students with credit in RELIG 308.

**L CLASS 387 Pre-Islamic North Africa**

★3 (fi 6) (either term, 3-0-0). The history of North Africa from the 1st millennium BC to the eve of the Arab conquest. Topics will include the first Phoenician and Greek settlements, Punic civilization, Roman and Vandal occupation and the Byzantine reconquest.

**CLASS 391 Introduction to Classical Field Archaeology**

★3-6 (variable) (variable, 0-10L-0). Not open to students with credit in CLASS 475 or 476. Note: Offered only for fieldwork in the archaeology of the Greek and Roman world and restricted to those participating in a fieldwork program sponsored by the Department.

**L CLASS 399 Topics in the Ancient World**

★3 (fi 6) (either term, 3-0-0).

**L CLASS 459 Roman Archaeology and Civilization**

★6 (fi 12) (two term, 5-0-15). A study of the old city of Rome, with lecturing trips to Etruria, Ostia, Terracina, Palestrina, Tivoli, Pompeii, Herculaneum, Cumae, and the Greek temples of Paestum. Designed to provide a richer understanding of Latin literature and Roman history and an introduction to advanced studies in Latin literature and Roman history and archaeology. Prerequisites: One university level course in History, Latin, or Classics and consent of Department. Note: This course is given in Rome during Spring/Summer only.

**L CLASS 463 Topics in Roman History**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: CLASS 282 or 283 or consent of Department.

**L CLASS 473 Topics in Classical Archaeology**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: Any one of CLASS 354, 355, 356, 358 or consent of Department.

**L CLASS 475 Techniques of Classical Field Archaeology**

★3-6 (variable) (variable, 0-10L-0). The techniques of survey, excavation and recording in Classical Archaeology. Prerequisites: Students must be either Classics majors or in a Classics graduate program. Note: Offered only for fieldwork in the archaeology of the Greek and Roman world and restricted to those participating in a fieldwork program sponsored by the Department. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**L CLASS 476 Advanced Field Techniques in Classical Archaeology**

★3-6 (variable) (variable, 0-10L-0). Advanced field application of Classical Archaeological Theory. Prerequisites: CLASS 475 or equivalent. Note: Offered only for fieldwork in the archaeology of the Greek and Roman world and restricted to those participating in a fieldwork program sponsored by the Department. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**L CLASS 478 Topics in Roman Art**

★3 (fi 6) (either term, 0-3s-0). In-depth study of aspects of Roman art. Prerequisite: CLASS 355 or 356 or consent of Department

**L CLASS 479 Topics in Roman Archaeology and Social History**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: CLASS 282, 283 or 355 or consent of Department.

**L CLASS 480 Topics in the Archaeology of the Roman Provinces**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: CLASS 282, 283 or 355 or consent of Department.

**CLASS 481 Topics in Greek History**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: CLASS 280 or consent of Department.

**CLASS 498 Individual Study of Literary Problems**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: Any one of CLASS 221, 261, 321, 322, or consent of Department.

**L CLASS 499 Individual Study of Historical and Archaeological Problems**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

**CLASS 500 Fourth-Year Honors Tutorial**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

**Graduate Courses****CLASS 501 Research Methods and Resources in Classics**

★1 (fi 2) (first term, 0-1s-0).

**CLASS 515 Topics in the Archaeology of Greece**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

**CLASS 516 Topics in the Archaeology of the Roman Provinces**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

**CLASS 520 Readings in Historical Sources**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

**CLASS 522 Studies in Ancient History**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

**CLASS 574 Pre-Roman Italy**

★3 (fi 6) (either term, 0-3s-0). The native cultures of the Italian peninsula from the beginning of the first millennium BCE to the end of the Samnitic wars. Prerequisites: Consent of Department.

**CLASS 578 Roman Art**

★3 (fi 6) (either term, 0-3s-0).

**CLASS 579 Topics in Roman Archaeology and Social History**

★3 (fi 6) (either term, 0-3s-0).

**CLASS 599 Individual Study**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: consent of Department. Repeatable.

**CLASS 601 Studies in Classical Archaeology I**

★3 (*fi 6*) (either term, 0-3s-0). Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**CLASS 602 Studies in Classical Archaeology II**

★3 (*fi 6*) (either term, 0-3s-0). Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**CLASS 900 Directed Research Project**

★3-9 (*variable*) (either term, unassigned).

## 231.83 Communications and Technology, COMM

Faculty of Extension

### Graduate Courses

For more information email [mact@ualberta.ca](mailto:mact@ualberta.ca), visit [www.mact.ca](http://www.mact.ca) or phone (780) 492-1538.

**COMM 501 Applied Research in Communications and Technology**

★3 (*fi 6*) (Spring/Summer, 3-0-0). Introduction to quantitative and qualitative approaches for conducting research into technology-mediated communications. Guides students in their topic selection and development for their culminating project. Restricted to MACT students, normally in the second year. Offered during the Spring Institute. Students may not receive credit for both EXT 501 and COMM 501.

**COMM 502 Human Communication**

★3 (*fi 6*) (Spring/Summer, 3-0-0). Survey of classic theories and emerging perspectives in communication studies. Emphasizes the development of skills for analyzing and understanding communication in context. Restricted to MACT students, normally in the first year. Offered during the Spring Institute. Students may not receive credit for both EXT 502 and COMM 502.

**COMM 503 Group Transactions**

★3 (*fi 6*) (Spring/Summer, 3-0-0). Examination of communication and interaction in small groups, with particular focus on workplace teams. Topics include the dynamics of group formation, phases of group development, emergent group structures, the nature and impacts of conflict, and leadership in groups. Restricted to MACT students, normally in the first year. Offered during the Spring Institute. Students may not receive credit for both EXT 503 and COMM 503.

**COMM 504 Organizational Communications**

★3 (*fi 6*) (either term, unassigned). This course deals with both internal communications (formal and informal) within an organization, and external communications (public relations, media relations, print and multimedia communications). Brief survey of the field of organizational analysis, with focus on marketing, clear language writing, rhetoric, public speaking, and writing for new media (e.g. hypertext). Restricted to MACT students. Course delivered by asynchronous Internet communication. Students may not receive credit for both EXT 504 and COMM 504.

**COMM 505 Using and Managing Communications Technologies**

★3 (*fi 6*) (first term, 3-0-0). Covers historical issues associated with the rise of selected communications technologies and considers the management issues of competitive strategy, organizational structure, and software/hardware selection as these may be applied to communications technologies in the organization. Restricted to MACT students, normally in the first year. Offered by asynchronous Internet communication. Students may not receive credit for both EXT 505 and COMM 505.

**COMM 506 Using and Managing Communications Networks**

★3 (*fi 6*) (Spring/Summer, 3-0-0). Examines the concept of a network as both an organizational form and an organizational resource. Explores the decision-making options that are created by the establishment of organizational networks. Restricted to MACT students, normally in the second year. Offered during the Spring Institute. Students may not receive credit for both EXT 506 and COMM 506.

**COMM 507 Knowledge Management and Communications Technologies**

★3 (*fi 6*) (first term, 3-0-0). Explores managing knowledge from an organizational perspective. Covers knowledge-management technologies and tools, as well as emerging issues and trends. Restricted to MACT students, normally in the second year. Offered by asynchronous Internet communication. Students may not receive credit for both EXT 507 and COMM 507.

**COMM 508 Culminating Project**

★6 (*fi 12*) (two term, unassigned). Under supervision, students undertake a project that addresses some practical problem, issue, or objective related to

communications and technology. Restricted to MACT students. Course delivered by asynchronous Internet communication.

**COMM 550 Introduction to Electronic Commerce**

★3 (*fi 6*) (either term, unassigned). An introduction to the concepts, technologies, and functions of electronic commerce. Considers the organizational implications of electronic commerce as a broad shift in how transactions are completed in the marketplace. Offered by asynchronous Internet communication. Students may not receive credit for both EXT 555 and COMM 550.

**COMM 551 Understanding Computing Projects: Application, Design, Project Management Issues for Communication**

★3 (*fi 6*) (either term, unassigned). An introduction to the fundamental concepts of computing projects and project design assumptions. Intended to assist communications professionals in making decisions in managing computing software, database and Internet-related projects. Offered by asynchronous Internet communication. Students may not receive credit for both EXT 551 and COMM 551.

**COMM 552 Intellectual Property: The Copyright Component**

★3 (*fi 6*) (either term, unassigned). An introduction to intellectual property with emphasis on Canadian copyright law as it applies to the development of multimedia projects. Examines the protection provided by trademarks, patents, and copyright for such media as digital photographs, logos, and inventions. Offered by asynchronous Internet communication. Students may not receive credit for both EXT 552 and EXT 597 titled Intellectual Property: The Copyright Component and COMM 552.

**COMM 553 Facilitating Communication and Understanding Through Utilization-Based Evaluation**

★3 (*fi 6*) (either term, unassigned). Senior seminar course examining the use of evaluation within various organizational contexts, with an emphasis on survey and focus-group methods. Student activities include development of an evaluation plan. Offered by asynchronous Internet communication. Students may not receive credit for both EXT 553 and EXT 597 titled Facilitating Communications and Understanding through Utilization-Focused Evaluation and COMM 553.

**COMM 597 Topics in Communications and Technology**

★3 (*fi 6*) (either term, unassigned). An elective course on selected topics in communications and technology. Offered by asynchronous Internet communication.

**COMM 598 Directed Study in Communications and Technology**

★3 (*fi 6*) (either term, unassigned). An elective course to be completed under the direction of a faculty member. Requires the approval of the Director. Offered by asynchronous Internet communication.

## 231.84 Community Service-Learning, CSL

Faculty of Arts

### Undergraduate Courses

**CSL 100 An Introduction to Community Engagement**

★3 (*fi 6*) (either term, 3-0-0). An interdisciplinary introduction to community and civic engagement for students interested in preparing the groundwork for undertaking further experiential educational opportunities (e.g., Internships, Study Abroad, CSL).

**CSL 300 Theory and Practice in Community Service-Learning**

★3 (*fi 6*) (either term, 3-0-0). An in-depth exploration of theories and practices of civic engagement and community change for students who have already completed a course with a CSL component and who wish to extend their volunteer experience. Prerequisite: Completion of a course with a CSL component or consent of instructor. Note: For information about courses in programs and departments across the Faculty of Arts that offer a CSL component, see the link on the CSL website, [www.csl.ualberta.ca](http://www.csl.ualberta.ca)

**CSL 350 Selected Topics in Community Service-Learning**

★1-6 (*variable*) (variable, unassigned). Content varies from year to year. Topics and credit value announced prior to registration period. Prerequisite: consent of instructor. This course may require payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**CSL 360 Community Service-Learning Practicum**

★1-6 (*variable*) (variable, unassigned). Course content varies from year to year but will include a significant service component. Topics and credit value announced prior to registration period. Prerequisite: consent of instructor. Corequisite: CSL 350. This course may require payment of an additional miscellaneous fee. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**CSL 480 Individual Study in Community Service-Learning**

★3 (*fi 6*) (*variable*, unassigned). Individual study opportunity on topics for which no specific course is currently offered. Prerequisites: Consent of Community

Service - Learning Director, consent of instructor, and completion of a 3 credit course with a CSL component.

## Graduate Courses

### CSL 550 Selected Topics in Community Service-Learning

★1-6 (*variable*) (variable, unassigned). Content varies from year to year. Topics and credit value announced prior to registration period. Prerequisite: consent of instructor. This course may require payment of an additional miscellaneous fee.

### CSL 560 Community Service-Learning Practicum

★1-6 (*variable*) (variable, unassigned). Course content varies from year to year but will include a significant community-based project component. Topics and credit value announced prior to registration period. Prerequisite: consent of instructor. Corequisite: CSL 550. This course may require payment of an additional miscellaneous fee.

## 231.85 Comparative Literature, C LIT

Office of Interdisciplinary Studies  
Faculty of Arts

### Notes

- (1) Courses in Comparative Literature teach a number of literatures from and international perspective with the help of translations as necessary.
- (2) See the following sections for listings of other Office of Interdisciplinary programs. Humanities Computing (HUCO); Interdisciplinary (INT D) Faculty of Arts Courses; Middle Eastern and African Studies (MEAS); Religious Studies (RELIG); Science, Technology and Society (STS) and Writing Studies (WRS).

## Undergraduate Courses

### **O** C LIT 100 World Literature

★6 (*fi 12*) (two term, 3-0-0). An introduction to major works of the world's literary heritage, presented in their historical, social, and cultural contexts. This course is designed to acquaint students with literature as an expression of human experience and to provide a foundation for senior courses in literature, and studies in the humanities and social sciences.

### **O** C LIT 171 Introduction to the Comparative Study of the Canadian Literatures I

★3 (*fi 6*) (first term, 3-0-0). An introductory course designed to compare the basic texts of English-Canadian and French-Canadian literatures until the 1950s.

### **O** C LIT 172 Introduction to the Comparative Study of the Canadian Literatures II

★3 (*fi 6*) (second term, 3-0-0). An introductory course designed to compare the basic texts of English-Canadian and French-Canadian literatures since the 1950s.

### **O** C LIT 201 Literature of the European Tradition I

★3 (*fi 6*) (either term, 3-0-0). A survey of European literary tradition from the Biblical and Graeco-Roman heritage to the Renaissance.

### **O** C LIT 202 Literature of the European Tradition II

★3 (*fi 6*) (either term, 3-0-0). A survey of the Western literary tradition from the Renaissance to the present day.

### **O** C LIT 206 Introduction to Literary Theory I

★3 (*fi 6*) (either term, 3-0-0). Key issues in the comparative study of literature (e.g. the nature of literature, basic text types, genres, literary history, text and reader, international literary relations).

### **O** C LIT 207 Introduction to Literary Theory II

★3 (*fi 6*) (either term, 3-0-0). Major contemporary theoretical schools, including deconstruction, poststructuralism, reader response, hermeneutics, feminism, queer theory, Marxism, and postcolonialism.

### **O** C LIT 228 Literature, Popular Culture, and the Visual Arts

★3 (*fi 6*) (either term, 3-0-0). Not open to students with credit in C LIT 440.

### **O** C LIT 242 Science Fiction

★3 (*fi 6*) (either term, 3-0-0). An introduction to science fiction as an international genre and a survey of works and trends

### **O** C LIT 243 Fairy Tales and Folk Tales

★3 (*fi 6*) (either term, 3-0-0). A survey of European fairy tales and an introduction to critical and theoretical approaches to the folk tale in general and the fairy tale in particular.

### **O** C LIT 256 Introduction to Colonial and Post-Colonial Literature

★3 (*fi 6*) (either term, 3-0-0). Introduction to the comparative study of the modern literatures of Asia, Africa and Latin America (including the Caribbean).

### **O** C LIT 266 Women and World Literature

★3 (*fi 6*) (either term, 3-0-0). An examination of major works of world literature by women from antiquity to the present.

### **O** C LIT 297 Special Topics in Comparative Literature

★3 (*fi 6*) (either term, 0-3s-0).

### **O** C LIT 338 Cross-Cultural Studies in Literature

★3 (*fi 6*) (either term, 3-0-0). Study of the complexities resulting from the interaction and interpenetration of the literatures of different cultures. Topics will vary from year to year.

### **O** C LIT 344 Elements of Narrative Fiction

★3 (*fi 6*) (first term, 3-0-0). An international survey of the main features of a narrative text, with historical examples and an emphasis on theory.

### **O** C LIT 345 Elements of Poetry

★3 (*fi 6*) (second term, 3-0-0). An international survey of the main features of a poetic text, with historical examples and an emphasis on theory.

### **O** C LIT 346 Elements of Drama

★3 (*fi 6*) (either term, 3-0-0). An international survey of the basic components and forms of dramatic structure, with historical examples and an emphasis on theory.

### **O** C LIT 352 Relations among Literature, the Arts, Film and the Media

★3 (*fi 6*) (either term, 3-0-0). Throughout history, literature had close relations with the other arts (such as painting and sculpture, music and theatre); more recently these relations extended to cinema television, and other media. Each year, the course will emphasize one of these relations, in an interdisciplinary perspective which stresses contacts and commonalities, but also the specific differences of art forms and the media.

### **O** C LIT 358 Great Themes of Literature and Art

★3 (*fi 6*) (either term, 3-0-0). The international and interdisciplinary study of selected international mythical and legendary themes and motifs, such as Faust and Don Juan, their origin, and their literary and artistic developments.

### **O** C LIT 363 Latin America in Its Literature (in English Translation)

★3 (*fi 6*) (either term, 3-0-0). Relations among the literature, culture, history, and politics of Latin America through a selection of texts originally written in Spanish, Portuguese and/or an indigenous language. Prerequisite: ★3 in any senior literature course, or consent of Department. Note: not to be taken by students with credit in LA ST 360 or SPAN 360.

### **O** C LIT 372 Comparative Studies in Canadian Prose

★3 (*fi 6*) (either term, 3-0-0). Study of narrative and other forms of Canadian prose, chiefly French and English, examined on a comparative basis within an international framework.

### **O** C LIT 397 Special Topics in Comparative Literature

★3 (*fi 6*) (either term, 0-3s-0).

### **O** C LIT 440 Comparative Studies in Popular Culture

★3 (*fi 6*) (either term, 3-0-0). An international historical and typological analysis of selected topics in popular literature and media, their changing status in society and culture, as well as their interaction with canonized forms of literature and the arts.

### **O** C LIT 444 Autobiographical Writing

★3 (*fi 6*) (either term, 3-0-0). A survey of autobiographical forms from antiquity to postmodernity and a study of theoretical problems of genre and subjectivity.

### **L** C LIT 448 Studies in Critical Theory

★3 (*fi 6*) (either term, 3-0-0). An advanced study of a particular critical theory. Topics may include Feminism, Marxism, Post-Colonialism.

### **L** C LIT 460 Fundamentals of Comparative Literature

★3 (*fi 6*) (either term, 3-0-0). Disciplinary issues, approaches and methodologies in Comparative Literature as they differ from those of national literatures.

### **L** C LIT 464 Studies in Literary Genres

★3 (*fi 6*) (either term, 3-0-0). An advanced study of 'genre' (e.g. the novel) in an international and a particular historical context.

### **O** C LIT 465 Literature and Society

★3 (*fi 6*) (either term, 3-0-0). International comparative studies of the interrelationship of literature and society.

### **O** C LIT 472 Advanced Comparative Studies in Canadian Prose

★3 (*fi 6*) (either term, 3-0-0). An advanced study of narrative and other forms of prose of Canadian literatures, chiefly French and English, examined on a comparative basis with an international framework.

### **L** C LIT 474 Studies in the Relationship of Literature and the Visual Arts

★3 (*fi 6*) (either term, 3-0-0). A cross-cultural study of the interrelations between art and literature.

### **L** C LIT 480 Directed Reading in Comparative Literature

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: consent of the Program Coordinator.

### **L** C LIT 497 Special Topics in Comparative Literature

★3 (*fi 6*) (either term, 0-3s-0).

### **L** C LIT 499 Honors Tutorial and Essay

★3 (*fi 6*) (either term, 0-3s-0). Preparation of the Honors Essay.



## Graduate Courses

### **L** C LIT 501 Studies in World Literature I

★3 (fi 6) (either term, 3-0-0). Prerequisite: Reading knowledge of one language other than English.

### **L** C LIT 502 Studies in World Literature II

★3 (fi 6) (either term, 3-0-0). Prerequisite: Reading knowledge of one language other than English.

### **O** C LIT 507 Topics in Major Contemporary Currents in Literary and Cultural Theory I

★3 (fi 6) (either term, 3-0-0). Variable content. Prerequisite: Reading knowledge of one language other than English. Note: equivalent to EASIA 507 and MLCS 507.

### **O** C LIT 508 Topics in Major Contemporary Currents in Literary and Cultural Theory II

★3 (fi 6) (either term, 3-0-0). Variable content. Prerequisite: Reading knowledge of one language other than English.

### **L** C LIT 511 History of Literary Theory

★3 (fi 6) (either term, 3-0-0). Variable Content. Reading knowledge of one language other than English is required.

### **L** C LIT 512 Topics in Literary Theory: From Plato to the New Criticism

★3 (fi 6) (either term, 3-0-0). Prerequisite: Reading knowledge of one Language other than English.

### **L** C LIT 521 Directed Reading Course I

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Program Coordinator.

### **L** C LIT 522 Directed Reading Course II

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Program Coordinator.

### **L** C LIT 560 Theories of Comparative Literature

★3 (fi 6) (either term, 3-0-0). Prerequisite: Reading knowledge of one language other than English.

### **L** C LIT 585 Studies in Forms and Genres

★3 (fi 6) (either term, 3-0-0). Prerequisite: Reading knowledge of one language other than English.

### **L** C LIT 610 Special Topics in Literary Theory and Criticism

★3 (fi 6) (either term, 3-0-0). Prerequisite: Reading knowledge of one language other than English.

### **L** C LIT 696 Seminar Course

★3 (fi 6) (either term, 0-3s-0). Prerequisite: Reading knowledge of two languages other than English.

### **L** C LIT 697 Special Reading Course I

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Program Coordinator.

### **L** C LIT 698 Special Reading Course II

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Program Coordinator.

### **C** LIT 900 Directed Research Project

★3 (fi 6) (variable, unassigned).

## 231.86 Computer Engineering, CMPE

Departments of Computing Science; Electrical and Computer Engineering  
Faculties of Engineering and Science

## Undergraduate Courses

### **CMPE 300 Introduction to the Software Engineering Process**

★3.8 (fi 6) (either term, 3-0-3/2). Complexity and change in software development. Project communication, organization, and scheduling. Team dynamics. Modeling with Universal Modeling Language (UML). Software requirements. Elicitation and analysis. Object modeling. Dynamic modeling. System design. Addressing design goals. Object design. Reuse and interfaces. Software implementation. Software testing. Rationale management. Configuration management. Software life cycle. Software process improvement. Corequisite: CMPUT 201.

### **CMPE 310 Software Requirements Engineering**

★3.5 (fi 6) (either term, 2-0-3). Software quality attributes. Software requirements. Requirements elicitation via interviewing, workshops, prototyping, and use case analysis. Vision document and Software Requirement Specification document standards. Formal software specification methods including operational and descriptive models. Design by contract. Verification and validation of requirements. Prerequisite: CMPE 300.

### **CMPE 320 Software Testing and Maintenance Engineering**

★3.8 (fi 6) (either term, 3-0-3/2). From software requirements specification to software testing. Risk analysis and metrics for software testing. Software testing

process, including test planning, design, implementation, execution, and evaluation. Test design via white box and black box approaches; coverage-based testing techniques. Unit, integration, and system testing. Acceptance tests. Software maintenance and regression testing. Prerequisite: CMPE 300.

### **CMPE 382 Computer Organization and Architecture**

★3 (fi 6) (either term, 3-0-0). Survey of modern computer architecture and design concepts. Benchmarks, instruction set design and encoding. Pipelined and superscalar processors. Techniques for exposing and exploiting instruction-level parallelism. Performance of cache and virtual memory hierarchies. Input/output subsystem design. Prerequisite: E E 380 or CMPUT 229. Credit may be obtained in only one of CMPE 382 or CMPUT 429.

### **CMPE 401 Computer Interfacing**

★3.8 (fi 6) (either term, 3-0-3/2). The design and use of digital interfaces, including memory, serial, parallel, synchronous and asynchronous interfaces. Hardware implementations of interrupts, buses, input/output devices. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisite: E E 380 or CMPUT 229, and CMPUT 201 or permission of the Instructor.

### **CMPE 402 C/C++ Programming for Engineers**

★3.8 (fi 6) (either term, 3-0-3/2). Introduction to the C/C++ programming language and object-oriented software design. Models of software development. Fundamental principles of software engineering. Procedure-oriented versus object-oriented software design. Built-in and user-defined data types. Abstract data types and objects. Basic control structures and input/output in C/C++. Functions, parameter passing mechanisms, and function overloading. Arrays and pointers. Classes and data abstraction. Operator overloading. Class hierarchies, inheritance, virtual functions, and polymorphism. Function and class templates. Exception handling. Generic programming and the C++ Standard Template Library. Prerequisite: ENCMP 100 or equivalent. Note: Cannot be taken for credit if credit has already been obtained in CMPUT 201.

### **CMPE 410 Exploring Software Development Domains**

★3.5 (fi 6) (either term, 2-0-3). Advanced programming concepts. Programming language as a vehicle for discussion about programming concepts such as productivity, components and re-use, traditional vs. scripting approaches. Object-oriented construction, systems programming, concurrent programming, Graphical User Interface (GUI) programming, distributed programming, and dynamic programming. Prerequisites: CMPE 320, CMPUT 379.

### **CMPE 420 Reliable and Secure Systems Design**

★3 (fi 6) (either term, 3-0-0). Causes and consequences of computer system failure. Structure of fault-tolerant computer systems. Methods for protecting software and data against computer failure. Quantification of system reliability. Introduction to formal methods for safety-critical systems. Computer and computer network security. Prerequisite: CMPE 300.

### **CMPE 425 Fault-Tolerant Computing**

★3 (fi 6) (either term, 3-0-0). Defects in manufacturing, failure mechanisms, and fault modeling. Reliability and availability theory. Static and dynamic redundancy and repair. Error correcting codes and self-checking systems. Roll-back strategies. Fault-tolerant computers and network architecture. Prerequisite: consent of the Department.

### **CMPE 440 Software Systems Design Project**

★4 (fi 6) (either term, 1-0-6). Design of software systems from concept to working prototype. Applying software engineering techniques. Working in small groups under constraints commonly experienced in industry. Exposing each team member to the design, implementation, documentation, and testing phases of the project. Managing software development projects. Provides a capstone experience in software development processes. Prerequisite: CMPE 410.

### **CMPE 449 Intelligent Systems in Engineering**

★3.8 (fi 6) (either term, 3-0-3/2). Intelligent systems for automatic control and data analysis. The concepts of vagueness and uncertainty, approximate reasoning, fuzzy rule-based systems and fuzzy control. Strategies for learning and adaptation, supervised and reinforcement learning, self-organization and the selection of neural network architectures. Discussion of the principles of search and optimization, evolution and natural selection and genetic algorithms. Introduction to hybrid intelligence. Applications of intelligent systems for pattern recognition, classification, forecasting, decision support, and control.

### **CMPE 450 Nanoscale System Design Project**

★4 (fi 6) (either term, 1-0-6). Design and verification of high-performance digital systems that integrate nanoscale devices onto a single solid-state substrate or assembly. System-level specification, design and verification; design re-use strategies and alternatives; and the application of practical defect and error-tolerance techniques. Students work in teams. Restricted to students in the Nanoscale System Design Option.

### **CMPE 480 Advanced Digital Logic Design**

★3.8 (fi 6) (either term, 3-0-3/2). Review of classical logic design methods. Introduction to the hardware description language VHDL. Logic simulation

principles. Digital system design. Digital system testing and design for testability. Arithmetic circuits. State-of-the-art computer-aided design tools and FPGAs are used to design and implement logic circuits. Corequisite: E E 351.

#### CMPE 485 Embedded Systems

★3.8 (fi 6) (either term, 3-0-3/2). Applications of embedded systems and challenges of embedded systems design; embedded processors, embedded reconfigurable hardware, embedded software; specification, modeling, design and verification of embedded systems; real time systems; construction of event-driven systems; performance issues; practical examples. Corequisites: CMPE 401, CMPUT 379.

#### CMPE 487 Data Communications Networks

★3 (fi 6) (either term, 3-0-0). Network topologies. Layered architectures and the Open Systems Interconnection (OSI) reference model. Peer-to-peer protocols, medium access control protocols, and local area network standards. Packet switched networks and routing, the Internet protocol, and the Asynchronous Transport Mode (ATM) standard. Note: Only one of the following courses may be taken for credit: CMPE 487 or CMPUT 313.

#### CMPE 488 Computer Aided Design of Nanoscale Systems

★3.8 (fi 6) (either term, 3-0-3/2). Brief history of Computer-Aided Design (CAD) systems for integrated circuit design. Structure and major features of a modern CAD system. Standard cells, hard macros and soft macros. Standard cell placement and routing algorithms. The Lin-Kernighan, simulated annealing and genetic optimization algorithms for CAD. Clock tree synthesis. Logic synthesis algorithms. Technology mapping algorithms. High-level synthesis. System-on-a-chip (SoC) technology. Prerequisite: CMPUT 201 or consent of the Department.

#### CMPE 490 Computer Engineering Design Project

★4 (fi 6) (either term, 1-0-6). Design of microprocessor systems, input/output systems, programmable timers, address decoding and interrupt circuitry. This course has a major laboratory component and requires the design and fabrication of a complete microprocessor-based system. This course may not be taken for credit if credit has already been obtained in CMPE 450. Prerequisites: CMPE 401 and 480.

#### CMPE 498 Special Topics in Computer Engineering

★3 (fi 6) (first term, 3-0-0). This course is intended to enable individuals or a small group of students to study topics in their particular field of interest under the supervision of a member of the Department of Electrical and Computer Engineering or the Department of Computing Science or other appropriate departments.

#### CMPE 499 Special Topics in Computer Engineering

★3 (fi 6) (second term, 3-0-0). This course is intended to enable individuals or a small group of students to study topics in their particular field of interest under the supervision of a member of the Department of Electrical and Computer Engineering or the Department of Computing Science, or other appropriate departments.

## 231.87 Computing Science, CMPUT

Department of Computing Science  
Faculty of Science

#### Notes

- (1) There are many routes to the study of Computing Science. Students should seek advice from a department advisor or visit our website at [www.cs.ualberta.ca/courses](http://www.cs.ualberta.ca/courses).
- (2) The department of Computing Science does not allow audits in any of its laboratory courses.
- (3) Special sections of CMPUT 196, 197, 198, 199, 296, 297, 298, 299, 396, 397, 398, 399, 496, 497, 498, 499 may have different prerequisites. Please check the specific course descriptions as posted by the Department of Computing Science.

### Undergraduate Courses

#### 0 CMPUT 101 Introduction to Computing

★3 (fi 6) (either term, 3-0-3). An introduction to fundamental concepts in computing science, including state, abstraction, composition, and representation. Introduction to algorithms, logic, circuits, machine architecture and other topics in elementary computing science. This course cannot be taken for credit if credit has been obtained in CMPUT 114, 174 or SCI 100. See Note (1) above.

#### 0 CMPUT 114 Introduction to Computing Science

★3 (fi 6) (either term, 3-0-3). An introduction to solving Computing Science problems by writing computer programs in a high-level programming language called Java. Students are introduced to objects and values, messages and methods, control structures, and simple containers. Discussion of elementary algorithms and software engineering techniques for constructing elegant and robust solutions to problems. Prerequisites: Pure Math 30 or Math 30-1. See Note (1) above.

#### 0 CMPUT 115 Programming with Data Structures

★3 (fi 6) (either term, 3-0-3). A study of dynamic data structures (e.g. sets, lists, stacks, queues, dictionaries) and their associated algorithms (e.g. traversal, sorting, searching, element addition and removal) using Java. An introduction to recursive

references and algorithms and to more advanced programming language techniques including inheritance and exceptions. Prerequisite: CMPUT 114.

#### 0 CMPUT 174 Introduction to the Foundations of Computation I

★3 (fi 6) (either term, 3-0-3). CMPUT 174 and 175 use a problem-driven approach to introduce the fundamental ideas of Computing Science. Emphasis is on the underlying process behind the solution, independent of programming language or style. Basic notions of state, control flow, data structures, recursion, modularization, and testing are introduced through solving simple problems in a variety of domains such as text analysis, map navigation, game search, simulation, and cryptography. Students learn to program by reading and modifying existing programs as well as writing new ones. No prior programming experience is necessary. See Note (1) above.

#### 0 CMPUT 175 Introduction to the Foundations of Computation II

★3 (fi 6) (either term, 3-0-3). A continuation of CMPUT 174, revisiting topics of greater depth and complexity. More sophisticated notions such as objects, functional programming, time and memory consumption, and user interface building are explored. Upon completion of this two course sequence, students from any discipline should be able to build programs to solve basic problems in their area, and will be prepared to take more advanced Computing Science courses. Prerequisite: CMPUT 174 or SCI 100.

#### CMPUT 196 Topics in Computing Science

★3 (fi 6) (either term, 3-0-3). See Note (3) above.

#### CMPUT 197 Topics in Computing Science

★3 (fi 6) (either term, 3-0-3). See Note (3) above.

#### CMPUT 198 Topics in Computing Science

★3 (fi 6) (either term, 3-0-3). See Note (3) above.

#### CMPUT 199 Topics in Computing Science

★3 (fi 6) (either term, 3-0-3). See Note (3) above.

#### CMPUT 201 Practical Programming Methodology

★3 (fi 6) (either term, 3-0-3). Introduction to the principles, methods, tools, and practices of the professional programmer. The lectures focus on the fundamental principles of software engineering based on abstract data types and their implementations. The laboratories offer an intensive apprenticeship to the aspiring software developer. Students use C and C++ and software development tools of the UNIX environment. Prerequisite: CMPUT 115 or 175.

#### CMPUT 204 Algorithms I

★3 (fi 6) (either term, 3-1s-0). The first of two courses on algorithm design and analysis, with emphasis on fundamentals of searching, sorting, and graph algorithms. Examples include divide and conquer, dynamic programming, greedy methods, backtracking, and local search methods, together with analysis techniques to estimate program efficiency. Prerequisites: CMPUT 115 or 175, CMPUT 272; MATH 113, 114, or 117 or SCI 100.

#### CMPUT 206 Introduction to Digital Image Processing

★3 (fi 6) (either term, 3-0-3). An introduction to basic digital image processing theory, and the tools that make advanced image manipulation possible for ordinary users. Image processing is important in many applications: editing and processing photographs, special effects for movies, drawing animated characters starting with photographs, analyzing and enhancing images captured by the Mars rover or the Hubble telescope, an detecting suspects from surveillance cameras. Image processing concepts are introduced using tools like Photoshop and GIMP. Exposure to simple image processing programming with JAVA and Matlab. This course is preparation for more advanced courses in the Digital Media area. Prerequisites: Any 100-level Computing Science course, plus knowledge of first-year level Math, Stat; and introductory JAVA, C, or similar programming experience; or consent of Instructor or SCI 100. Open to students in the Faculty of Arts, Engineering and Sciences, others require permission of the instructor.

#### CMPUT 210 Codes, Codemakers, Codebreakers: An Introduction to Cryptography

★3 (fi 6) (either term, 3-0-3). An historical introduction to cryptography intended for a general audience. The development of codes and code-breaking from military espionage in ancient Greece to deciphering hieroglyphics via the Rosetta stone to modern computer ciphers. Includes frequency analysis, one-time-pad security, and public key cryptography. Prerequisites: Any 100 level course.

#### CMPUT 229 Computer Organization and Architecture I

★3 (fi 6) (either term, 3-0-3). General introduction to number representation, architecture and organization concepts of von Neumann machines, assembly level programming, exception handling, peripheral programming, floating point computations and memory management. Prerequisite: CMPUT 115 or 175. Corequisite: CMPUT 201. Credit may be obtained in only one of CMPUT 229, 285 or E E 380.

#### CMPUT 250 Computers and Games

★3 (fi 6) (either term, 3-0-3). An interdisciplinary course for students in Science, Arts, and other faculties. The focus is on games as interactive entertainment, their role in society, and how they are made. Teams composed of students with diverse backgrounds (e.g. English, Art and Design, and Computing Science) follow the entire creative process: from concept, through pitch, to delivery, of a short

narrative-based game using a commercial game engine. To achieve the required mix of backgrounds and experience, students must apply for admission to this course. Prerequisites: Second-year standing. See the Computing Science web site for more details at [www.cs.ualberta.ca/courses](http://www.cs.ualberta.ca/courses)

**01 CMPUT 272 Formal Systems and Logic in Computing Science**

★3 (fi 6) (either term, 3-1s-1.5). An introduction to the tools of set theory, logic, and induction, and their use in the practice of reasoning about algorithms and programs. Basic set theory. The notion of a function. Counting. Propositional and predicate logic and their proof systems. Inductive definitions and proofs by induction. Program specification and correctness. Prerequisite: Any 100-level CMPUT course or SCI 100.

**CMPUT 291 Introduction to File and Database Management**

★3 (fi 6) (either term, 3-0-3). Basic concepts in computer data organization and information processing; entity-relationship model; relational model; SQL and other relational query languages; storage architecture; physical organization of data; access methods for relational data. The programming language used in the course project is Java. Prerequisite: CMPUT 115 or 175.

**CMPUT 296 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-3). See Note (3) above.

**CMPUT 297 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-3). See Note (3) above.

**CMPUT 298 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-3). See Note (3) above.

**CMPUT 299 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-3). See Note (3) above.

**CMPUT 300 Computers and Society**

★3 (fi 6) (either term, 3-1s-0). Social, ethical, professional, economic, and legal issues in the development and deployment of computer technology in society. Prerequisites: CMPUT course or SCI 100, and any 200-level course.

**CMPUT 301 Introduction to Software Engineering**

★3 (fi 6) (either term, 3-0-3). Object-oriented design and analysis, with interactive applications as the primary example. Topics include: software process; revision control; Unified Modeling Language (UML); requirements; software architecture, design patterns, frameworks, design guidelines; unit testing; refactoring; software tools. Prerequisite: CMPUT 201.

**CMPUT 302 Introduction to Human Computer Interaction**

★3 (fi 6) (either term, 3-0-3). A complementary course to introductory software engineering focused on a user-centered approach to software design. The main themes are how humans interact with physical and information environments, and how to design software with human's information needs and their cognitive capacities in mind. Topics include the user-centered design cycle, and evaluation methods for discovering usability problems in interface design. Pre or co-requisite: CMPUT 301.

**CMPUT 304 Algorithms II**

★3 (fi 6) (either term, 3-0-0). The second course of a two-course sequence on algorithm design. Emphasis on principles of algorithm design. Categories of algorithms such as divide-and-conquer, greedy algorithms, dynamic programming; analysis of algorithms; limits of algorithm design; NP-completeness; heuristic algorithms. Prerequisites: CMPUT 204; one of STAT 151, 221, 235 or 265; one of MATH 225, 228, 229, 328 or consent of Instructor.

**CMPUT 306 Image Processing: Algorithms and Applications**

★3 (fi 6) (either term, 3-0-3). Introduction, history, and applications; scanning and quantization; visual perception; output devices; pattern recognition; feature extraction, decision theory, classification rules; data representation and formats; image enhancement and restoration; edge detection, segmentation and texture; correlation and registration. Prerequisites: CMPUT 201; MATH 214 and one of STAT 222, 252 or 266. Credit may be obtained in only one of CMPUT 306 or EE BE 540.

**CMPUT 307 3D Graphics and Animation with 3DS Max**

★3 (fi 6) (either term, 3-0-3). Interdisciplinary introduction to Graphics and Animation through the use of the 3D Studio Max package. Graphics and Animation have industrial applications in advertising, movies, games and TV. Interdisciplinary teams will work together on practical applications of graphics and animations. For example, students can work on a project to enhance sculpting skills using a database of 3D models. Prerequisite: Any second or higher-level undergraduate student, with some math, computer programming and image processing background, or permission of the instructor.

**CMPUT 313 Computer Networks**

★3 (fi 6) (either term, 3-0-3). Introduction to computer communication networks. Protocols for error and flow control. Wired and wireless medium access protocols. Routing and congestion control. Internet architecture and protocols. Multimedia transmission. Recent advances in networking. Prerequisites: CMPUT 201, 204, 229 or E E 380; one of STAT 222, 252 or 266.

**CMPUT 325 Non-Procedural Programming Languages**

★3 (fi 6) (either term, 3-0-3). A study of the theory, run-time structure, and

implementation of selected non-procedural programming languages. Languages will be selected from the domains of functional, and logic-based languages. Prerequisites: CMPUT 201, 204, 229 or E E 380, MATH 120.

**CMPUT 329 Computer Organization and Architecture II**

★3 (fi 6) (either term, 3-0-3). CMOS technology, digital circuits, combinational logic, sequential logic, memory technologies, programmable logic devices, control logic design, register transfer logic, CPU design, hardware description languages. Prerequisite: CMPUT 229 or E E 380. Credit may be obtained in only one of CMPUT 280, 329 or E E 280.

**CMPUT 333 Security in a Networked World**

★3 (fi 6) (either term, 3-0-3). Authentication protocols, passwords, shared and public key cryptography, network protocol and network services security, firewalls, malicious code, vulnerability identification, intrusion detection, wireless security. Prerequisite: CMPUT 201.

**CMPUT 340 Introduction to Numerical Methods**

★3 (fi 6) (either term, 3-1s-3). Computer arithmetic and errors. The study of computational methods for solving problems in linear algebra, non-linear equations, interpolation and approximation, and integration. The aim is to teach the student the proper use of mathematical subroutine packages currently available in computer libraries. Prerequisites: CMPUT 204, MATH 120, 214; one of STAT 222, 252 or 266.

**CMPUT 350 Advanced Games Programming**

★3 (fi 6) (either term, 3-0-3). This course focuses on state-of-the-art AI and graphics programming for video games. Part 1 introduces C++, the language of choice for video game engines, emphasizing efficiency, safety, the Standard Template Library, and OpenGL. Part 2 on real time strategy deals with efficient pathfinding algorithms, planning, and scripting AI systems. Student projects give hands-on experience directly applicable to the video games industry. Prerequisite: CMPUT 201. May not be offered every year.

**CMPUT 366 Intelligent Systems**

★3 (fi 6) (either term, 3-0-3). Introduction to artificial intelligence focusing on techniques for building intelligent software systems and agents. Topics include search and problem-solving techniques, knowledge representation and reasoning, reasoning and acting under uncertainty, machine learning and neural networks. Recent applications such as planning and scheduling, diagnosis, decision support systems, and data mining. Prerequisites: CMPUT 204; one of STAT 151, 221, 235 or 265.

**CMPUT 379 Operating System Concepts**

★3 (fi 6) (either term, 3-0-3). Processes: process state transitions; operations on processes; interrupt processing; parallel processing; multiprocessor considerations; resource allocation; critical sections and events; semaphores; deadlock; avoidance, detection, and recovery; memory management; virtual memory; paging and segmentation; page replacement strategies; working sets; demand paging; scheduling: levels, objectives, and criteria; scheduling algorithms; file system functions; file organization; space allocation; elements of operating systems security. Prerequisites: CMPUT 201, 204, 229 or E E 380.

**CMPUT 391 Database Management Systems**

★3 (fi 6) (either term, 3-0-3). Database design and normalization theory, transaction management, query processing and optimization; support for special data types such as multimedia, spatial data, and XML documents, support for complex applications and data analysis such as data mining, data warehousing, and information retrieval. Prerequisites: CMPUT 204 and 291.

**CMPUT 396 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-3). See Note (3) above.

**CMPUT 397 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-3). See Note (3) above.

**CMPUT 398 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-3). See Note (3) above.

**CMPUT 399 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-3). See Note (3) above.

**CMPUT 400 Industrial Internship Practicum**

★3 (fi 6) (first term, 0-3s-0). Required by all students who have just completed a Computing Science Industrial Internship Program. Must be completed during the first academic term following return to full-time studies. Note: A Grade of F to A+ will be determined by the student's job performance as evaluated by the employer, by the student's performance in the completion of an internship practicum report, and by the student's ability to learn from the experiences of the internship as demonstrated in an oral presentation. Prerequisite: WKEXP 956, 957 or 958.

**CMPUT 401 Software Process and Product Management**

★3 (fi 6) (either term, 3-1s-3). All phases of software development are reviewed from a process perspective. Best practices in software project and product development and management are introduced. Architectural and technological impacts on management. Group projects require specification and initial design or redesign of a software system. Prerequisites: CMPUT 301.



**CMPUT 402 Software Quality**

★3 (fi 6) (either term, 3-0-3). Software quality issues, metrics, verification, validation, and testing. Students working in project groups are required to complete the implementation of a system or significant subsystem and undertake unit, integration and acceptance testing. Industry standard assessment methods such as CMM or SPICE are introduced. Prerequisite: CMPUT 401.

**CMPUT 403 Practical Algorithmics**

★3 (fi 6) (either term, 3-0-0). The essence of computing science is in solving problems by computation. It may take anywhere from several minutes to several years from the initial posing of a problem specification to finally getting a working program. This course is interested in problems that can be solved within at most several hours by well prepared people. Prerequisites: Restricted to students participating in the programming contest. Any 300 level course, and consent of the instructor.

**CMPUT 410 Web-Based Information Systems**

★3 (fi 6) (either term, 3-0-3). Overview of Web technologies and applications. This course is project based and addresses issues such as web-based applications and databases design and implementation, XML data exchange and modeling, application component integration over the Web, security mechanisms, and Web Mining for intelligent web-based applications. Prerequisite: CMPUT 301 and 391 or consent of Instructor.

**CMPUT 411 Introduction to Computer Graphics**

★3 (fi 6) (either term, 3-0-3). 2-D and 3-D transformation; 3-D modeling and viewing; illumination models and shading methods; texture mapping; ray tracing. Prerequisites: CMPUT 204, 301 and MATH 120. Credit may be obtained in only one of CMPUT 311 and 411.

**CMPUT 412 Experimental Mobile Robotics**

★3 (fi 6) (either term, 3-0-3). A project-based course dealing with the design and implementation of mobile robots to accomplish specific tasks. Students work in groups and are introduced to concepts in sensor technologies, sensor data processing, motion control based on feedback and real-time programming. Prerequisites: CMPUT 201, 204; MATH 214 and one of STAT 222, 252 or 266.

**CMPUT 414 Introduction to Multimedia Technology**

★3 (fi 6) (either term, 3-0-3). Intro to basic principles and algorithms used in multimedia systems. Students obtain hands-on experience in issues relating to multimedia data representation, compression, processing, and retrieval. Topics include sound transmission, music streaming, 2-D and 3-D graphics, image and video, human perceptual issues associated to multimedia technologies. Prerequisite: any 300 level CMPUT course; knowledge of second year level MATH/STAT; JAVA, C, or equivalent programming; or consent of Instructor.

**CMPUT 415 Compiler Design**

★3 (fi 6) (either term, 3-0-3). Compilers, interpreters, lexical analysis, syntax analysis, syntax directed translation, code generation, code optimization. Prerequisites: CMPUT 229 or E E 380 and a 300-level Computing Science course or consent of Instructor.

**CMPUT 418 Numerical Methods 1: Numerical Linear Algebra and Non-Linear Equations**

★3 (fi 6) (either term, 3-1s-3). Basic numerical concepts: representations, accuracy and stability. Linear equations: Existence and uniqueness, problem transformations. Factorizations: LU, QR, SVD and Eigen values, vectors. Various applications including data-fitting using polynomials and other bases. Non-linear equations and optimization: Existence, uniqueness, sensitivity, conditioning, convergence rates; methods: 1-D and n-D search methods including Bisection, Newton, Gauss-Newton, Broyden, Levenberg-Marquart. Trust region methods and homotopy embeddings. Short introduction to numerical differential and integral calculus. Prerequisite: one of MATH 101, 115 or 118 and one of MATH 102, 120, 125 or 127.

**CMPUT 419 Numerical Methods 2: Computational Differential Equations**

★3 (fi 6) (either term, 3-1s-3). Survey of classical methods for numerical quadrature, differentiation and integration of differential equations. Existence, uniqueness and conditioning of solutions. Discrete function systems: Global polynomials, trigonometric bases, bases with local support/splines.  $L_2$  projection and error analysis of discrete function approximations. Galerkin's method. Archetype differential equations, their solution using Galerkin Finite Element methods, and error analysis: Two point boundary value problems (BVP), scalar initial value problems (IVP), systems of IVP, variational methods. Partial Differential Equations (PDE): Poisson, heat, wave, stationary convection-diffusion, elliptic eigenvalue problems. Abstraction: Lax-Milgram theorem, abstract FEM, stability. Prerequisites: one of MATH 102, 120, 125 or 127 and one of MATH 209, 214 or 217. Recommended Corequisites: one of MATH 201 or 334.

**CMPUT 422 Analysis of Computer Systems I**

★3 (fi 6) (either term, 3-0-3). An introduction to measurement, simulation and analytical techniques for studying the performance of computer systems; including operating systems and communication networks. Topics include workload modeling; introduction to simulation, measurement and analysis techniques; analysis of results; data presentation. Prerequisites: CMPUT 313 or 379. May not be offered every year.

**CMPUT 425 Object-Oriented Programming Languages**

★3 (fi 6) (either term, 3-0-3). This course will study the computational model and runtime structure of object-oriented programming languages including objects, classes, object creation, initialization, inheritance, polymorphism, message passing, methods, binding, and dispatch. Throughout the course, the object-oriented computing model will be introduced and contrasted with the imperative model. A detailed study of Smalltalk will provide an example of a pure object-oriented programming language. Prerequisite: CMPUT 325 and 379. May not be offered every year.

**CMPUT 429 Computer Systems and Architecture**

★3 (fi 6) (either term, 3-0-3). A discussion of computer system design concepts with stress on modern ideas that have shaped the high-performance architecture of contemporary systems. Instruction sets, pipelining, instruction-level parallelism, register reuse, branch prediction, CPU control, and related concepts. Memory technologies, caches, I/O, high-performance backplanes and buses. Prerequisite: CMPUT 201, 229 or EE 380. Credit may be obtained in only one of CMPUT 429 or CMPE 382.

**CMPUT 466 Machine Learning**

★3 (fi 6) (either term, 3-0-3). Learning is essential for many real-world tasks, including adaptive control, recognition, diagnosis, forecasting and data-mining. This course will typically present a variety of learning algorithms (for learning decision trees, rule sets, neural networks, and belief nets), as well as general learning frameworks such as reinforcement learning and nearest neighbor approaches. It will also provide the formal foundations for understanding when learning is possible and practical. Prerequisite: CMPUT 204; one of STAT 151, 221, 235 or 265.

**CMPUT 470 Computational Neuroscience**

★3 (fi 6) (either term, 3-0-3). This is an interdisciplinary course covering areas in Computing Science, Neuroscience and Biomedical Engineering. It covers three main areas. How do biological systems represent and process information at the level of single neurons? How is this information processed at the level of small neural networks? How is this information used to control body movements. Given the interdisciplinary nature of this course, we will ensure that students first learn the fundamental concepts of other the disciplines before they are applied. Prerequisites: PHYSYL 372 or PMCOL 371 or CMPUT 340.

**CMPUT 474 Formal Languages, Automata, and Computability**

★3 (fi 6) (either term, 3-0-0). Formal grammars; relationship between grammars and automata; regular expressions; finite state machines; pushdown automata; Turing machines; computability; the halting problem; time and space complexity. Prerequisite: a 300-level CMPUT course and one of MATH 225, 228, 229, 328 or consent of Instructor.

**CMPUT 481 Parallel and Distributed Systems**

★3 (fi 6) (either term, 3-0-0). This course provides an undergraduate-level introduction to parallel programming, parallel and distributed systems, and high-performance computing in science and engineering. Both shared-memory parallel computers and distributed-memory multicomputers (e.g., clusters) will be studied. Aspects of the practice of, and (some) research issues in, parallelism will be covered. There will be an emphasis on thread programming, data-parallel programming, and performance evaluation. Prerequisite: CMPUT 201, CMPUT 379, or permission of the instructor. May not be offered every year.

**CMPUT 495 Honors Seminar**

★0 (fi 1) (either term, 0-1s-0). This weekly seminar brings students, researchers, and practitioners together to examine a variety of topics, both foundational and leading edge. Content varies over successive offerings of the course. Required of all Honors Computing Science students during each Fall/Winter semester of their degree program. Prerequisite: Restricted to Honors Computing Science students, or consent of the instructor.

**CMPUT 496 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-3). See Note (3) above.

**CMPUT 497 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-3). See Note (3) above.

**CMPUT 498 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-3). See Note (3) above.

**CMPUT 499 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-3). See Note (3) above.

**Graduate Courses****CMPUT 500 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-3).

**CMPUT 501 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-3).

**CMPUT 502 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-3).

**CMPUT 510 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-3).

**CMPUT 511 Topics in Computer Graphics**

★3 (fi 6) (either term, 3-0-3).

**CMPUT 530 Topics in Computer Architecture**

★3 (fi 6) (either term, 3-0-3).

**CMPUT 551 Topics in Artificial Intelligence**

★3 (fi 6) (either term, 3-0-3).

**CMPUT 603 Teaching and Research Methods**

★3 (fi 6) (first term, 2-1s-0). A description of computing science research, with emphasis on research methodology. Includes techniques and conventions that are employed in various sub-areas of computing science, both for doing research and presenting results. Strategies and information for being an effective teaching assistant are also presented. Required for all graduate students.

**CMPUT 604 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 605 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 606 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 607 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 608 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 609 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 610 Topics in Computer Graphics**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 611 Advanced Computer Graphics**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 613 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 614 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 615 Topics in Image Processing and Vision**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 616 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 617 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 618 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 620 Topics in Programming Languages**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 621 Constraint Programming**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 625 Topics in Programming Languages**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 631 Robotics**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 640 Topics in Computer Networks**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 642 Topics in Computer Networks**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 643 Topics in Computer Networks**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 644 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 650 Topics in Artificial Intelligence**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 651 Topics in Artificial Intelligence**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 652 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 654 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 655 Topics in Artificial Intelligence**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 656 Topics in Artificial Intelligence**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 660 Topics in Software Engineering**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 662 Software Specification and Verification**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 663 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 666 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 670 Topics in the Theory of Computation**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 672 Algorithmic Graph Theory**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 673 Complexity Theory**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 674 Topics in Combinatorial Computing**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 675 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 680 Topics in Systems**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 681 Topics in Parallel and Distributed Systems**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 692 Modern Database Management Systems**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 694 Topics in Databases**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 695 Knowledge Discovery in Data**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 697 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 701 Essay in Computing Science I**

★6 (fi 12) (either term, 0-1s-5). A major essay on an agreed topic.

## 231.88 Dance, DANCE

Faculty of Physical Education and Recreation

**Note:** See also INT D 439 for a course which is offered by more than one Department or Faculty and which may be taken as an option or as a course in this discipline.

### Undergraduate Courses

**DANCE 200 The Spectrum of Dance in Society**

★3 (fi 6) (either term, 1-0-2). The theory and practice of dance as a human physical activity. Focus will be on the aesthetic, expressive, rhythmical dimensions of movement in a culture's artistic and social life. The study will include movement content, techniques, improvisation, composition and performance in a variety of dance forms including modern/creative, social, jazz, and folk dance.

**DANCE 340 Modern Dance**

★3 (fi 6) (either term, 0-3L-0). The study of creative dance techniques, improvisation, composition, and performance through theory and practical experience.

**DANCE 345 Modern Dance Techniques**

★3 (fi 6) (either term, 0-3L-0). Development of personal movement skills in a variety of modern dance techniques combined with knowledge of movement and dance principles. Prerequisite: DAC 160 or 165, or DANCE 200 or 340, or equivalent, or consent of Instructor.

**DANCE 350 International Folk Dance**

★3 (fi 6) (either term, 0-3L-0). The study of folk dances in selected cultures through theory and practical experience. Theory will focus on costume, music, history, geography, and other elements which influence the dances.

**DANCE 431 Study of Dance for Children**

★3 (fi 6) (either term, 1-0-2). Children's dance from the perspective of the child as creator, performer and spectator. Opportunities to observe, work with and instruct children creative dance will be provided. Prerequisite: PEDS 293 or 338 or consent of Instructor.

**DANCE 446 Modern Dance Composition**

★3 (fi 6) (either term, 3-0-0). Theory and practice of modern dance improvisation and composition, principles of form and design, individual and group choreography, evaluation. Prerequisite: One of DANCE 100, 340, 431, or consent of Faculty.

**DANCE 497 Selected Topics in Dance**

★3 (fi 6) (either term, 0-3L-0). Topics of current interest in the area of Dance. Note: Topics will vary from Term to Term. Prerequisite: Consent of Instructor.

**DANCE 499 Directed Studies**

★3 (fi 6) (either term, 0-3s-0). An individualized course designed to offer an in-depth study in a dance area not covered by regular courses. Prerequisite: consent of Faculty.

**231.89 Dance Activity, DAC**

Faculty of Physical Education and Recreation

Goals of DAC Level I

- (1) Acquisition of basic skills required in the activity and an appreciation of how these skills are used in combination in performance situations.
- (2) Development of the specific theoretical knowledge associated with terminology, history, sociocultural context, rules and organizational aspects, basic strategies and tactics, technique and other concepts relevant to the activity.

**Notes**

- (1) Students enrolled in courses offered by the Faculty of Physical Education and Recreation must take responsibility for ensuring that they are physically and medically fit to be taking such courses. If a student has a physical or medical condition that may compromise his/her participation in a course, it is the student's responsibility to so inform the instructor of that course. Students may contact the Faculty for further information on physical activity requirements and are encouraged to seek medical advice if necessary.
- (2) Students are expected to attend the first class of any activity course appropriately dressed for activity participation.

**Undergraduate Courses****DAC 155 Social Dance**

★1.5 (fi 3) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in several variations and sequences of the foxtrot, waltz, tango, jive, rumba, and cha cha. Integral to this will be the development of good partnering and rhythmic abilities.

**DAC 160 Jazz Dance**

★1.5 (fi 3) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in body awareness and placement, locomotion and choreographed jazz dance.

**DAC 197 Selected Topics in Dance**

★1.5 (fi 3) (either term, 0-3L-0). Selected topics in Dance Activity. Note: Topics will vary from Term to Term. Prerequisite: Consent of Instructor.

**DAC 199 Directed Studies**

★1.5 (fi 3) (either term, 0-3L-0). An individualized course designed to offer an in-depth study in a dance activity not covered by regular courses. Prerequisite: consent of Faculty.

**231.90 Danish, DANSK**Department of Modern Languages and Cultural Studies  
Faculty of Arts**Notes**

- (1) The Department reserves the right to place students in the language course appropriate to their level of language skill.
- (2) Placement tests may be administered in order to assess prior background. Students with a Danish language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in a more advanced course suitable to their level of ability. Students seeking to fulfill their Language Other than English requirement may begin at any one appropriate level, but must take the full ★6 in one language.
- (3) The Department will withhold credit from students completing courses for which prior background is deemed to make them ineligible. For example, 100-level courses are normally restricted to students with little or no prior knowledge in that language. Should students with matriculation standing, or those possessing prior background (such as native speakers or those for whom it is their first language) register in the 100-level course, credit may be withheld.
- (4) See also listing under Modern Languages and Cultural Studies (MLCS) and Scandinavian (SCAND).

**Undergraduate Courses****DANSK 111 Beginners' Danish I**

★3 (fi 6) (either term, 5-0-0). Designed to give basic practical skill in everyday spoken and written Danish. The oral approach, using the laboratory, is followed.

The most current Course Listing is available on Bear Tracks.

Note: not to be taken by students with credit in DANSK 100, or with native or near native proficiency, or Danish 30 or its equivalents in Canada and other countries.

**DANSK 112 Beginners' Danish II**

★3 (fi 6) (either term, 5-0-0). Prerequisite: DANSK 111 or consent of Department. Note: not to be taken by students with credit in DANSK 100, or with native or near native proficiency, or Danish 30 or its equivalents in Canada and other countries.

**DANSK 211 Second-Year Danish I**

★3 (fi 6) (either term, 4-0-0). Reading and study of selected texts in Danish literature and culture. Conversation and composition. Prerequisite: Danish 30 (or equivalent) or DANSK 112 or consent of Department. Note: not to be taken by students with credit in DANSK 200.

**DANSK 212 Second-Year Danish II**

★3 (fi 6) (either term, 4-0-0). Prerequisite: DANSK 211 or consent of Department. Note: not to be taken by students with credit in DANSK 200.

**231.91 Dental Hygiene, D HYG**Department of Dentistry  
Faculty of Medicine and Dentistry**Undergraduate Courses****D HYG 203 Human Anatomy**

★4 (fi 8) (two term, 54 hours). Overview of human structures with added emphasis on head and neck anatomy. Emphasis will be on anatomical structures as they relate to function. Open to dental hygiene students or with permission of the course coordinator.

**D HYG 210 Dental Hygiene Practice I**

★3 (fi 6) (either term, 39 hours). An introductory lecture course integrating the knowledge and practice of clinical dental hygiene. The course topics focus on a client-centered care model including assessment, diagnosis, planning, implementation and evaluation process for dental hygiene practice. Disease prevention and health maintenance are core philosophies that are integrated into all aspects of this course.

**D HYG 211 Dental Hygiene Practice II**

★6 (fi 12) (two term, 78 hours). A continuation from D HYG 210 in dental hygiene study that advances the student's knowledge and application to practice. The course also includes knowledge of dental specialties and concepts of materials used in dental and dental hygiene practice. Further topics in dental hygiene practice will be introduced. Prerequisite D HYG 210.

**D HYG 212 Preclinical Dental Hygiene**

★6 (fi 12) (either term, 180 hours). An introduction to fundamental techniques in disease control, instrumentation, assessment techniques, and related clinical procedures are presented and discussed.

**D HYG 213 Introduction to Clinical Practice I**

★3 (fi 6) (either term, 102 hours). A clinical course integrating the knowledge, practice, and skills of dental hygiene practice.

**D HYG 220 Oral Health Education**

★3 (fi 6) (either term, 52 hours). This lecture and practicum course provides an introduction to oral health education. Topics include teaching theory, interactive teaching methods, preparations of audiovisual resources and public speaking. The students will assess the needs and learning profile of specified audience and will develop an appropriate lesson plan. The plan will be presented to a simulated audience and is videotaped for self assessment purposes.

**D HYG 230 Dental Anatomy**

★1 (fi 2) (either term, 15 hours). A lecture and self-study course that includes topics of tooth nomenclature, biologic considerations of tooth form and function; and permanent and deciduous teeth are studied in detail.

**D HYG 240 Radiology**

★2 (fi 4) (two term, 43 hours). A comprehensive didactic, pre-clinical and clinical course that deals with the production of x-rays, their interactions with matter, radiation biology and protection, the appearances of normal anatomy on radiographs and common abnormalities seen on radiographs made in the practice of dental hygiene. Pre-clinical and clinical sessions will introduce students to the basic techniques of intraoral radiography and pantomography.

**D HYG 313 Dental Hygiene Practice III**

★8 (fi 16) (first term, 235 hours). A clinical and seminar dental hygiene course that focuses on comprehensive dental hygiene care and education for clients with chronic and acute variances in oral health. Following an evidence-based decision making framework, the course advances the student's knowledge and application of the client-centered care model including assessment, diagnosis, planning, implementation and evaluation processes for dental hygiene practice. Learning experiences occur in a variety of clinical settings.

<https://www.beartracks.ualberta.ca>



**D HYG 314 Dental Hygiene Practice IV**

★8 (fi 16) (second term, 235 hours). This advanced course in dental hygiene practice provides dental hygiene students with teaching opportunities and advanced dental hygiene practice in various settings. Prerequisite: D HYG 313.

**D HYG 316 Dental Hygiene Care for Complex Clients**

★3 (fi 6) (two term, 39 hours). A lecture course that emphasizes client centered management and care of clients with complex needs including specific needs for geriatric clients. Complex needs of clients may involve the physically, mentally, sensory and medically compromised. Concepts learned in theory will be applied in clinical settings in D HYG 313 and 314.

**D HYG 317 Evidence for Dental Hygiene Practice**

★3 (fi 6) (two term, 39 hours). A team instructed course that will provide students with a framework for critiquing scientific literature and the implications for dental hygiene practice, and an opportunity to conduct a leadership project within their community and present their project to peers in a scientific meeting format. This course will also discuss many issues related to the practice of dental hygiene.

**D HYG 321 Oral Health Education II**

★2 (fi 4) (either term, 52 hours). A continuation of D HYG 220. The application of educational theory to teaching is provided by field experience in a variety of community settings.

**D HYG 322 Population Health, Health Promotion and Community**

★3 (fi 6) (either term, 39 hours). This course prepares students with an understanding of the factors that affect the health and well-being of the population. Students will learn about the determinants of health and suggest strategies for working with other disciplines and community agencies to affect health outcomes. The course demonstrates applied public health principles in today's dental public health practice. Concepts of dental public health practice, examples of current programming in Alberta and Canada, and evidence-based public health prevention will be studied in context of the dental public health practice model.

**D HYG 326 Periodontology for the Dental Hygienist**

★2.5 (fi 5) (two term, 38 hours). Periodontology is an integral part of the practice of dental hygiene. This course provides foundational knowledge in the science of Periodontology, as well as an emphasis on non-surgical and surgical periodontal therapies. Through this knowledge, integrated with case studies and presentations, students are able to assess, plan, implement and evaluate client centered evidence based dental hygiene therapy.

**D HYG 329 External Rotation**

★2.5 (fi 5) (two term, 75 hours). Each student will spend two weeks at an external placement. During this period, students will provide a broad range of health promotional activities including preventive dental hygiene therapies, classroom education and oral health instruction. The aim of this program is to provide a private practice clinical experience or a community focused opportunity to provide primary and secondary oral health interventions.

**D HYG 340 Dental Radiography**

★1 (fi 2) (two term, 24 hours). A clinical course in which students will gain further experience in intraoral radiography and pantomography. Students will also gain limited experience in radiographic interpretation.

**D HYG 386 Anaesthesia**

★2.5 (fi 5) (either term, 60 hours). A didactic and lab course covering anatomy, physiology, and pharmacology of different anaesthetics. Local anaesthetic techniques covering all types of infiltration and intraoral blocks from the major component of the clinic-laboratory sessions. Students will also be able to describe the techniques, drug reactions and complications involving the use of local anesthetics and have practical experience in the administration of local anesthetic drugs.

**D HYG 413 Advanced Practicum**

★3 (fi 6) (first term, 90 hours). This practicum and seminar course may encompass hospital, community, and/or dental hygiene practice. Students may be placed in various practicum locations.

**D HYG 414 Addictions Awareness Module**

★3 (fi 6) (either term or Spring/Summer, 42 hours). An overview of the psychology, physiology, and pharmacology of substance dependence and addiction. The student will recognize the signs and symptoms of substance dependence and implications for oral health management. The focus of the module is on developing knowledge, attitudes and skills for tobacco reduction initiatives and tobacco cessation counselling in the dental office and community health practice.

**D HYG 417 Practice Management : Small Business and Entrepreneurship**

★3 (fi 6) (either term, 39 hours). This distance course will provide an opportunity for students to explore and articulate their own philosophy of dental hygiene practice. Additionally, this course will provide an opportunity to explore various facets of practice management in an area of special interest to the student.

**D HYG 418 Long Term Care and Dental Hygiene Services**

★3 (fi 6) (either term, 39 hours). This distance course will focus on the development of dental hygiene care in continuing and long-term care facilities. Approaches to patient-centred care and role of the family will be explored. Students will be involved in experiential learning activities and case based group discussions.

**D HYG 422 Health Information and Policy**

★3 (fi 6) (either term, 39 hours). This course provides students with the opportunity to examine and understand policies that impact oral health in a community setting. Students will follow the development, implementation, impact and evaluation of community-based policies and oral health programs for dental hygiene practice. Also offered as a distance course pursuant to enrolment quota.

**D HYG 430 Individual Study in Dental Hygiene**

★3 (fi 6) (either term, 39 hours). Designed to allow the undergraduate student to independently pursue a topic in dental hygiene. A course advisor will be assigned. May be repeated once. Prerequisites: consent of Program Director.

**D HYG 440 Advocacy for Change in Healthcare**

★3 (fi 6) (either term, 39 hours). Provides an overview of the professional, social, political and global trends and issues affecting health and health care delivery. Through the application of a framework for planned change, this course will demonstrate how health care professionals can act as change agents in society. Also offered as a distance course pursuant to enrolment quota.

**D HYG 468 Research Methods**

★3 (fi 6) (either term, 39 hours). This distance course will provide an introduction to the process of research through critical appraisals of selected quantitative and qualitative studies, and design of a small research project. The emphasis is on understanding the research process, focusing on the planning and implementation phases of research, and on the application of statistics. Prerequisites: SOC 210 (or comparable introductory statistics course) and D HYG 317 (or comparable course or permission of the instructor).

**231.92 Dentistry, DENT**

Department of Dentistry  
Faculty of Medicine and Dentistry

**Graduate Courses****DENT 530 Orthodontic Techniques and Biomechanics**

★3 (fi 6) (either term, 3-0-3). A comprehensive overview of the fundamentals of biomechanics in orthodontic treatment. Involves both the theoretical and practical application of biomechanical principles to orthodontic problem resolution through classroom and laboratory instruction.

**DENT 531 Orthodontic Biomechanics and Techniques**

★1 (fi 2) (either term, 1-0-1). This advanced course in orthodontic biomechanics and techniques will provide orthodontic graduate students the biomechanical analysis and understanding of how to handle complex clinical orthodontic cases. This course will instruct the orthodontic graduate students in the use of mini screws in clinical orthodontics. Prerequisite: DENT 530.

**DENT 532 Growth and Development**

★2 (fi 4) (second term, 2-0-0). A detailed review of the postnatal growth and development of human craniofacial structures. Longitudinal and cross sectional growth data are presented. (Course offered in alternate years).

**DENT 540 Orthodontic Seminars**

★6 (fi 12) (two term, 175 hours). Selected orthodontically related theoretical and practical topics along with orthodontic case management presentations are discussed in both seminar and preclinical formats.

**DENT 541 Orthodontic Clinics**

★10 (fi 20) (two term, variable). Applied clinical education and experience is obtained through supervised management of selected orthodontic cases.

**DENT 542 Research Methodology**

★1 (fi 2) (two term, 30 hours). Review of scientific methodology and direction of students in technic of evaluating dental literature. A research proposal or literature review is required as part of this course.

**DENT 551 Introduction to Applied Statistics**

★3 (fi 6) (either term, 3-0-2). Analysis of variance, multiple linear regressions, measures of association and agreement, logistic regression, and non-parametric methods. Topics will also include sample size calculation, power analysis, and a brief introduction to meta-analysis. The concepts will be illustrated by problems in the dental and medical sciences. Applications to real data will be emphasized through the use of SPSS, and R.

**DENT 552 Applied Multivariate Statistical Analysis**

★3 (fi 6) (either term, 3-0-2). Multivariate analysis of variance, repeated measures, multivariate linear regression, principal components, discriminate analysis, cluster analysis, and multidimensional scaling will be studied. Topics will also include shape analysis in three dimensions. The concepts will be illustrated by problems in dentistry and the medical sciences. Each student will submit a written report and present a research project focusing on these statistical methods. Applications to real data will be emphasized through the use of SPSS, and R. Prerequisite: DENT 551.

**DENT 562 TMD/Orofacial Pain**

★2 (fi 4) (second term, 39 hours). Seminars in the diagnosis and treatment of

temporomandibular joint problems. Includes a comprehensive literature review. Emphasis placed on orthodontic considerations in the prevention and management of mandibular dysfunction. (Course offered in alternate years.)

#### **DENT 563 Temporomandibular Disorders Orofacial Pain Clinics**

★6 (*fi 12*) (two term, variable). First year applied clinical program in which clinical education and experience is obtained through supervised management of patients presenting with temporomandibular disorders and/or other orofacial pains.

#### **DENT 564 Introduction to Temporomandibular Disorders/Orofacial Pain**

★3 (*fi 6*) (first term, 39 hours). A didactic course that provides students with general principals and guidelines for the diagnosis and treatment of temporomandibular disorders and other orofacial pains.

#### **DENT 565 Evidence Based Dentistry**

★2 (*fi 4*) (first term, 26 hours). This course focuses on the general principles of evidence based dentistry. It will cover some basic principles of epidemiology, formulation of the clinical question, search and acquisition of available scientific evidence, critical appraisal and application of evidence in a dentistry context. A final written assignment is a course requirement.

#### **DENT 566 Systematic Reviews in Dentistry**

★2 (*fi 4*) (second term, 26 hours). This course focuses on the general principles of Systematic Review and Meta-Analysis in Dentistry. It will cover principles, procedures, problems and limitations in Systematic Reviews. Different types of Systematic Reviews would be analyzed. Use of Meta-Analysis as a statistical tool in Systematic Reviews will also be covered. Having a systematic review ready for submission to a peer reviewed journal is a course requirement. Prerequisite: DENT 565.

#### **DENT 640 Orthodontic Seminars**

★6 (*fi 12*) (two term, 175 hours). Second year seminar and preclinical presentations. Requires successful completion of DENT 540.

#### **DENT 641 Orthodontic Clinics**

★10 (*fi 20*) (two term, variable). Second year applied clinical educational program. Requires successful completion of DENT 541.

#### **DENT 663 Temporomandibular Disorders/Orofacial Pain Clinics**

★6 (*fi 12*) (two term, variable). Second year applied clinical program in which clinical education and experience is obtained through supervised management of patients presenting with temporomandibular disorders and/or other orofacial pains. Prerequisite: DENT 563.

#### **DENT 740 Orthodontic Seminars**

★6 (*fi 12*) (two term, 175 hours). Third year seminar and preclinical presentations. Requires successful completion of DENT 640.

#### **DENT 741 Orthodontic Clinics**

★10 (*fi 20*) (two term, variable). Third year applied clinical educational program. There will be 3 one-week internships as part of this course. Requires successful completion of DENT 641.

#### **DENT 900 TMD Orofacial Pain Directed Research Project**

★6 (*fi 12*) (variable, unassigned). Capping exercise for the program in the form of a project developed and approved by the supervisor, such as a publishable paper and prepared for departmental presentation.

## 231.93 Dentistry, DDS

Department of Dentistry  
Faculty of Medicine and Dentistry

### Undergraduate Courses

#### **DDS 506 Gastroenterology and Nutrition**

★5 (*fi 10*) (either term, 6 weeks). An integrated course covering nutrition, gastrointestinal physiology, pathophysiology and anatomy. Related surgical, paediatric and geriatric topics will also be addressed. Open only to students registered in the DDS program.

#### **DDS 507 Neurosciences**

★9 (*fi 18*) (either term, 11 weeks). Fundamental Clinical Neurosciences taught in an integrated fashion. Involves instruction in subject areas related to the head and neck, including Neuroanatomy, Neurophysiology, Neuropathology, Neuropharmacology, Neuroradiology, Neurology, Neurosurgery, Psychiatry, Rehabilitation Medicine, Otorhinolaryngology, and Ophthalmology. Open only to students registered in the DDS program.

#### **DDS 508 Oncology**

★2 (*fi 4*) (either term, 2 weeks). Principles and concepts of clinical oncology. Open only to students registered in the DDS program.

#### **DDS 509 Pre-Clinical Practice of Dentistry I**

★12 (*fi 24*) (either term, 9 weeks). An introduction to the art and science of clinical practice. Building on the foundation of epidemiology, bacteriology, and gross and microscopic anatomy of the teeth and jaws, students develop an

understanding of the genesis of the carious process, and study the restoration of carious teeth and the related rationale. An introduction to the radiographic imaging process and interpretation of radiographs. Students use restoration materials and learn their physical and chemical properties. The principles of occlusion are also introduced.

#### **DDS 510 Patient-Centred Care**

★6 (*fi 12*) (two term, 2-6s-0). A discussion of dental skills which may be generalized across different disease states and different specialties. Topics include epidemiology, evidence-based dentistry and public health, history-taking and clinical skills in patients of all age groups and backgrounds, ethics, family issues, health in specific sections of the community and related areas. Open only to students registered in the DDS program. Corequisite: INT D 410.

#### **DDS 514 Anatomy (Dental)**

★2 (*fi 4*) (either term, 60 hours). Coronal, radicular and pupal morphology of the primary and permanent dentitions.

#### **DDS 518 Oral Biology I**

★4 (*fi 8*) (two term, 60 hours). Development, histology, and comparative anatomy of the craniofacial complex and dental tissues.

#### **DDS 520 Patient-Centred Care**

★6 (*fi 12*) (two term, 2-6s-0). A continuation of DDS 510, which involves further discussion of medical skills which may be generalized across different disease states and different specialties. Open only to students registered in the DDS program.

#### **DDS 523 Musculoskeletal System**

★6 (*fi 12*) (two term, 7 weeks). Anatomy, physiology, pathophysiology and management in the musculoskeletal system. Open only to students registered in the DDS program.

#### **DDS 529 Pre-Clinical Practice of Dentistry II**

★25 (*fi 50*) (two term, 19 weeks). Students begin studying all phases of clinical dentistry including diagnosis and treatment planning, anaesthesia, periodontics, endodontics, fixed and removable prosthodontics and orthodontics. An introduction to ethics in dentistry. Students are introduced to the clinic, and limited diagnosis and treatment of patients begin.

#### **DDS 532 Oral Biology II**

★4 (*fi 8*) (two term, 60 hours). A multidisciplinary course that examines the unique physiology, biochemistry and nutritional requirements of the oral cavity. Topics include functions of the periodontal tissues, the temporomandibular joint, mastication, swallowing, speech, special reflexes involving cranial nerves, receptors of the stomatognathic system, and salivary glands and the role of saliva in caries. Oral manifestations of metabolic disease, the physiology of pain, and the role of nutrition in the development of oral tissues and the maintenance of oral health will also be discussed.

#### **DDS 541 Dental Pharmacology**

★1 (*fi 2*) (either term, 15 hours). An introduction to the principles of pharmacology including mechanisms of drug action; pharmacokinetics and drug metabolism; and mechanisms of drug interactions and adverse drug reactions. These principles will be applied to groups of drugs acting on various organ systems of the body, representative drugs being selected whenever possible for their physiological and clinical significance to the practice of dentistry. Particular emphasis will be placed on anaesthetics, antacids, autonomic drugs and drugs with selective toxicity employed in infections and malignancies.

#### **DDS 545 Clinical Practice I**

★52 (*fi 104*) (two term, 39 weeks). An introduction to the art and science of clinical dentistry in the patient care setting. Utilizing a patient-centered approach, students develop the skills to diagnose and develop a treatment plan addressing patients' needs; to deliver basic restorative dentistry; to perform basic endodontic procedures; to assist in oral surgery; to provide periodontal therapy from basic to more advanced needs; to treat pediatric patients; to deliver basic removable prosthodontic services; to provide basic fixed prosthodontic services that may incorporate dental implantology; and to manage basic orthodontic needs of patients. Diagnostic services such as radiology are incorporated during the diagnosis and treatment. Students learn to manage ethical dilemmas and provide care according to existing codes of ethics. Clinical observation may require off-site rotations. Students gain their clinical experience at intramural and extramural sites.

#### **DDS 547 Geriatrics**

★1 (*fi 2*) (either term, 15 hours). An introductory course describing the needs of the elderly. The course will examine the changing population balance in Canada involving both medical and dental aspects of people over 60 years of age.

#### **DDS 549 Oral Biology III**

★3 (*fi 6*) (two term, 70 hours). A seminar course designed to give the student an appreciation and understanding of current areas of research in dentistry and the experimental approaches used. Students will be required to design and carry out an independent research project under the guidance of a faculty member.

#### **DDS 555 Practice Management**

★1 (*fi 2*) (either term, 15 hours). This course introduces the third-year dental

students to practice management topics and concepts necessary for today's successful practice of dentistry. These topics include financial planning, banking, dental office records, different modes of practice, marketing, and time management. The emphasis is to achieve an awareness of how these topics affect a dentist in today's society.

#### DDS 565 Clinical Practice II

★50 (*fi 100*) (two term, 30 weeks). A clinical course building on Clinical Practice I with emphasis on more complex patient needs involving all disciplines. Students perform oral surgery procedures as the prime operator. Students are also assigned to external programs such as the satellite clinics. Clinical observation may require off-site rotations. A hospital rotation is included (University of Alberta Hospitals and Glenrose Hospital). Students deliver comprehensive dental care in a Clinical Teaching Unit. The approved research project designed in DDS 549 will be completed and presented in the senior year.

#### DDS 800 Special Registration

★0 (*fi 0*) (either term, unassigned). Dentistry undergraduate and postgraduate students who have been admitted to the University of Alberta Faculty of Medicine and Dentistry as a Visiting Student in accordance with the Faculty guidelines will be required to register in this course for the purpose of entitlement to registration in the Alberta Dental Association and College Education Register if applicable.

#### DDS 829 Pre-Clinical Assessment for Students Applying to the Advanced Placement Program

★12 (*fi 38*) (Spring/Summer, 3-0-0). Students begin studying all phases of clinical dentistry including diagnosis and treatment planning, anaesthesia, periodontics, endodontics, operative dentistry, fixed and removable prosthodontics and orthodontics. Students receive an introduction to ethics in dentistry. Students perform tasks mainly in a pre-clinical (laboratory) environment and have a brief introduction to the clinic with limited diagnosis and treatment of patients. Restricted to candidates registered as Special Students in the DDS Advanced Placement Program.

## Graduate Courses

#### DDS 533 Oral Pathology

★2 (*fi 4*) (variable, 30 hours). The diagnosis, pathology and treatment of common diseases of the oral and maxillofacial structures.

## 231.94 Dentistry/Medicine, DMED

Department of Dentistry  
Faculty of Medicine and Dentistry

## Undergraduate Courses

#### DMED 511 Introduction to Medicine and Dentistry

★3 (*fi 6*) (either term, 5 weeks). An introduction to the basic health science with a review of some aspects of the essential biochemistry, physiology, anatomy and pharmacology. Particular emphasis on basic medical genetics. Open only to students registered in the MD or DDS program.

#### DMED 512 Infection, Immunity and Inflammation

★6 (*fi 12*) (either term, 7 weeks). Basic and clinical aspects of immunity, inflammation and infection, including relevant parts of haematology. Infection with various classes of micro-organisms, and the appropriate management is an important focus. Open only to students registered in the MD or DDS program.

#### DMED 513 Endocrine System

★6 (*fi 12*) (either term, 6 weeks). An examination of the endocrine system in health and disease, with particular reference to the mechanisms of disturbances in the endocrine system, and the management of these conditions. Open only to students registered in the MD or DDS program.

#### DMED 514 Cardiovascular, Pulmonary and Renal Systems

★11 (*fi 22*) (either term, 14 weeks). The normal function of the heart and blood vessels, lungs and kidney, the changes in these functions which occur in disease and the management of the conditions which result from such changes in function. Open only to students registered in the MD or DDS program.

## 231.95 Design, DES

Department of Art and Design  
Faculty of Arts

**Note:** Because presence at lectures and seminars, participation in classroom discussion, and the completion of assignments are important components of most courses, regular attendance is expected. This particularly applies to studio courses where attendance is a factor in grading. Students are expected to have successfully completed prerequisite course(s) with a minimum grade of B-. Consent of Department may be withheld in cases where the grade in a prerequisite course is below a B-.

## Undergraduate Courses

#### DES 135 Design Fundamentals

★3 (*fi 6*) (either term, 0-6L-0). Studio-based introduction to the conceptual and practical concerns of the design disciplines. Two- and three-dimensional design-related studies. Note: ART 134 and DES 135 are required prerequisites for senior level ART or DES courses. Not open to students with credit in ART 131 or ART 132.

#### DES 138 Design Fundamentals I

★3 (*fi 6*) (first term, 0-6L-0). Studio-based introduction to the conceptual and practical concerns of the design disciplines. Two- and three-dimensional design-related studies. Note: Restricted to BFA and BDesign students.

#### DES 139 Design Fundamentals II

★3 (*fi 6*) (second term, 0-6L-0). Further study of the conceptual and practical concerns of the design disciplines. Two- and three-dimensional design-related studies. Note: Restricted to BFA and BDesign students. Prerequisite: DES 138.

#### DES 300 Foundations of Industrial Design I

★3 (*fi 6*) (first term, 0-6L-0). Introduction to the principles, methods and techniques of industrial design. Studies of three-dimensional design address concept, form and function in a social/environmental context and involve projects combining theory and practice in two and three dimensions. Prerequisites: ART 134 and DES 135 or ART 136 and DES 138. Corequisite: DES 302 and consent of Department. BDes Students must enroll in DES 301 in second term. Note: Not open to students with credit in DES 370.

#### DES 301 Foundations of Industrial Design II

★3 (*fi 6*) (second term, 0-6L-0). Continuing study of the principles, methods and techniques of industrial design. Studies of three-dimensional design address concept, form and function in a social/environmental context and involve projects combining theory and practice in two and three dimensions. Prerequisites: DES 300. Corequisite: DES 303 and consent of Department.

#### DES 302 Introduction to Visual Presentation I

★3 (*fi 6*) (first term, 0-6L-0). Introductory studies in models and graphics based projects implementing the materials and processes of traditional visualization methods and media. Prerequisite and corequisite: DES 300 and consent of the Department. BDes students must enroll in DES 303 in second term. Note: Not open to students with credit in DES 371 or DES 375.

#### DES 303 Introduction to Visual Presentation II

★3 (*fi 6*) (second term, 0-6L-0). Continuing studies in models and graphics based projects implementing the materials and processes of traditional visualization methods and media. Prerequisites: DES 302. Corequisite: DES 301 and consent of the Department. Note: Not open to students with credit in DES 371 or DES 376.

#### DES 337 Special Projects in Studio Disciplines

★6 (*fi 12*) (two term, 0-6L-0). Special projects in studio disciplines by special arrangement with the Department. Prerequisites: ART 134 and DES 135 or ART 136 and DES 138, and consent of Department. Formerly DES 339.

#### DES 338 Special Projects in Studio Disciplines

★3 (*fi 6*) (either term, 0-6L-0). An introductory design course intended to meet special teaching needs not otherwise satisfied under existing course offerings. Prerequisites: ART 134 and DES 135 or ART 136 and DES 138 and consent of Department.

#### DES 384 Introduction to Integrative Design

★3 (*fi 6*) (second term, 0-6L-0). Introductory studies include 3-D model building, application of type, symbols and signage in 3-D environments, materials and fabrication and printing processes. Corequisites: DES 301 or DES 394. Not to be taken by students with credit in both DES 301 and DES 394.

#### DES 393 Foundations of Visual Communication Design I

★3 (*fi 6*) (first term, 0-6L-0). Introduction to the principles of visual communication design. Study of communication concerns through the use of photography and typography. Emphasis on appropriateness, clarity, expression and description. Introduction to information and publication design problems. Prerequisites: ART 134 and DES 135, or ART 136 and DES 138, and consent of department. BDes students must enroll in DES 394 in second term. Note: Not open to students with credit in DES 390.

#### DES 394 Foundations of Visual Communication Design II

★3 (*fi 6*) (second term, 0-6L-0). Continuing study of the principles of visual communication design. Study of communication concerns through the integration of photography and typography. Emphasis on appropriateness, clarity, expression and description. Introduction to information and publication design problems. Introduction to the computer as a tool for language and visual communication. Prerequisites: DES 393, and consent of Department. Note: Not open to students with credit in DES 390.

#### DES 395 Introduction to Form, Visual Elements and Systems

★3 (*fi 6*) (first term, 0-6L-0). Structure, representation and expression. Creation, observation and categorization. Form, color and tone systems in contemporary and historical design, and in the environment. Prerequisite or corequisite: DES 393 and consent of the Department.



**L DES 396 Introduction to Research and Theory in Design**

★3 (fi 6) (second term, 0-6L-0). Introduction to information gathering methods, literature search and empirical research. Problem identification and definition. Purposes, goals, design and evaluation methods. Communication theory. Corequisite: DES 394 and consent of the Department.

**L DES 400 Intermediate Industrial Design Principles and Practices I**

★3 (fi 6) (first term, 0-6L-0). Subject areas include research methods and the design processes; communication skills and collaborative dynamics, human factors, the psychology of design, material properties and applications for fabrication and production, market considerations. Projects are 2-D, 3-D and computer-based. Prerequisites: DES 302 and DES 303 and consent of Department. BDes Students must enroll in DES 401 in second term. Note: Not open to students with credit in DES 470.

**L DES 401 Intermediate Industrial Design Principles and Practices II**

★3 (fi 6) (second term, 0-6L-0). Subject areas include research methods and the design processes; communication skills and collaborative dynamics, human factors, the psychology of design, material properties and applications for fabrication and production, market considerations. Projects are 2-D, 3-D and computer-based. Prerequisites: DES 400 and consent of Department. Note: Not open to students with credit in DES 470.

**L DES 402 Product Design Principles and Practices I**

★3 (fi 6) (either term, 0-6L-0). A studio-based course which implements design principles and practices with a focus on their application to product design for batch production and mass production. Experimentation and concept development with computer technology. 2-D media and 3-D models and mock-ups. Prerequisite or corequisite: DES 400 and consent of Department. Note: Not open to students with credit in DES 475.

**L DES 403 Furniture Design Principles and Practices I**

★3 (fi 6) (either term, 0-6L-0). A studio-based course which implements design principles and practices with a focus on their application to furniture design for batch production and mass production. Experimentation and concept development with computer technology. 2-D media and 3-D models and prototypes. Prerequisite: DES 400 Corequisite: DES 401 and consent of Department. Note: Not open to students with credit in DES 477.

**L DES 425 Word and Image: Intermediate Projects in Printmaking for Designers and Artists**

★6 (fi 12) (two term, 0-6L-0). Exploration of the multiple relationships between word and image generated through consideration of text. Prerequisites: ART 322 and DES 394. Note: Registration priority will be given to BDesign Printmaking Route students. Not open to students who have successfully completed ART 425.

**DES 437 Special Projects in Studio Disciplines**

★6 (fi 12) (two term, 0-6L-0). Special projects in studio disciplines by special arrangement with the Department. Prerequisite: consent of Department. Formerly DES 439.

**DES 438 Special Projects in Studio Disciplines**

★3 (fi 6) (either term, 0-6L-0). An intermediate design course intended to meet special teaching needs not otherwise satisfied under existing course offerings. Prerequisite: Consent of Department.

**L DES 483 Seminar on Design Issues**

★3 (fi 6) (either term, 0-3s-0). Contemporary design issues in the fields of theory, criticism, history, professional practice and social concerns. Restricted to third-year Bachelor of Design students. Prerequisite(s): ART H 209 and/or consent of Department.

**L DES 484 Integrative Design Principles and Practices I**

★3 (fi 6) (first term, 0-6L-0). Studio-based course which integrates Visual Communication Design and Industrial Design concepts and practices. Individual and group projects address subjects including: signs, symbols, and communication; as well as products, packaging, and graphics. Pre- or corequisites: DES 300 and 393 or DES 300 and 384, or DES 393 and 384 and consent of Department. Note: Not open to students with credit in DES 482.

**DES 485 Integrative Design Principles and Practices II**

★3 (fi 6) (second term, 0-6L-0). Studio-based course which integrates Visual Communication Design and Industrial Design concepts and practices. Individual and group projects address subjects such as point of purchase displays and retail environments, combining 2-D and 3-D considerations. Pre- or corequisites: DES 301 and 394 or DES 301 and 384, or DES 394 and 384 and consent of Department. Note: Not open to students with credit in DES 482.

**L DES 493 Concepts and Systems in Visual Communication Design I**

★3 (fi 6) (first term, 0-6L-0). Systematic approaches to typographic, graphic and diagrammatic communication, image creation and manipulation. Project management and research. Prerequisites: DES 394 and consent of Department. BDes Students must enroll in DES 494 in second term. Note: Not open to students with credit in DES 490.

**L DES 494 Concepts and Systems in Visual Communication Design II**

★3 (fi 6) (second term, 0-6L-0). Systematic approaches to typographic, graphic

and diagrammatic communication, image creation and manipulation. Project management and research. Prerequisites: DES 493 and consent of Department. Note: Not open to students with credit in DES 490.

**L DES 495 The Image I**

★3 (fi 6) (first term, 0-6L-0). Further studies in the use of the photographic image in the design context. The communicative function of the image. Representation, description, expression and persuasion. History and theory of the use of images. Prerequisites or corequisites: DES 493 and consent of Department.

**L DES 496 The Image II**

★3 (fi 6) (second term, 0-6L-0). Complex image creation for communicational purposes mainly in electronic media. Introduction to criticism. Prerequisite: DES 493 and corequisite: DES 494 and consent of Department.

**L DES 497 Advanced Typography**

★3 (fi 6) (first term, 0-6L-0). Typography in the context of language communication. Design of letterforms. The study of notation schemes. The history of letterforms, history of printing and book design. Corequisite DES 493 and consent of Department.

**L DES 498 Information Design**

★3 (fi 6) (second term, 0-6L-0). Text, tables, charts, diagrams and electronic displays. User-machine interaction: perception and cognition. Visual presentation of abstract and quantitative information. Corequisite DES 494 and consent of Department.

**L DES 500 The Practice of Industrial Design I**

★3 (fi 6) (first term, 0-6L-0). Subject areas include design and culture; human factors; social, environmental and economic implications of design; appropriate technologies; production considerations processes; communication skills and collaborative dynamics; human factors; the psychology of design; material properties and applications for fabrication and production; market considerations. Projects are 2-D, 3-D and computer-based. Prerequisites: DES 401 and consent of Department. BDes Students must enroll in DES 501 in second term. Note: Not open to students with credit in DES 570.

**L DES 501 The Practice of Industrial Design II**

★3 (fi 6) (second term, 0-6L-0). Subject areas include design and culture; human factors; social, environmental and economic implications of design; appropriate technologies; production considerations processes; communication skills and collaborative dynamics; human factors; the psychology of design; material properties and applications for fabrication and production; market considerations. Projects are 2-D, 3-D and computer-based. Prerequisites: DES 500 and consent of Department. Note: Not open to students with credit in DES 570.

**L DES 502 Product Design Applications and Technologies**

★3 (fi 6) (first term, 0-6L-0). A studio-based course in which projects address the requirements of special user groups and specific markets with special consideration of the production capabilities of western Canada. Computer-aided design and manufacturing will be the focus of at least one project. Prerequisite: DES 402. Corequisite: DES 500 and consent of Department. Note: Not open to students with credit in DES 575.

**L DES 503 Furniture Design Applications and Production Technologies**

★3 (fi 6) (second term, 0-6L-0). A studio-based course in which projects address the requirements of special user groups and specific markets with special consideration of the production capabilities of western Canada. Computer-aided design and manufacturing will be the focus of at least one project. Prerequisite: DES 403. Corequisite: DES 501 and consent of Department. Note: Not open to students with credit in DES 576.

**DES 525 Word and Image: Advanced Projects in Printmaking for Designers and Artists**

★6 (fi 12) (two term, 0-6L-0). Exploration of the multiple relationships between word and image generated through consideration of text. Prerequisite: DES 425 or ART 425. Note: Registration priority will be given to BDesign Printmaking Route students. Not open to students who have successfully completed ART 525.

**DES 537 Special Projects in Studio Disciplines**

★6 (fi 12) (two term, 0-6L-0). Special projects in studio disciplines by special arrangement with the Department. Prerequisite: consent of Department. Formerly DES 539.

**DES 538 Special Projects in Studio Disciplines**

★3 (fi 6) (either term, 0-6L-0). An advanced design course intended to meet special teaching needs not otherwise satisfied under existing course offerings. Prerequisite: consent of Department.

**DES 584 Integrative Design Applications I**

★3 (fi 6) (either term, 0-6L-0). A 2-D/3-D studio-based course in which projects address the research, development and fabrication requirements of educational and interpretive design, with special consideration of technological and cultural contexts. Prerequisites: DES 484 and/or DES 485 and consent of Department.

**DES 585 Integrative Design Applications II**

★3 (fi 6) (either term, 0-6L-0). A 2-D/3-D studio-based course in which projects address the research, development and fabrication requirements of

commercial applications of design in specific settings, with special consideration of technological and cultural contexts. Prerequisites: DES 484 and/or DES 485 and consent of Department.

#### DES 586 Design Practicum I

★3 (fi 6) (first term, 0-6L-0). Design internship in design offices, industry, museums and other appropriate professional hosts and venues, bridging formal education and professional practice. Prerequisite: consent of Department.

#### DES 587 Design Practicum II

★3 (fi 6) (second term, 0-6L-0). Design internship in design offices, industry, museums and other appropriate professional hosts and venues, bridging formal education and professional practice. Prerequisite: consent of Department.

#### DES 593 The Practice of Graphic Design I

★3 (fi 6) (first term, 0-6L-0). Applied practical projects and complex design systems. Problem definition, strategic planning, project management and design evaluation. Project brief and production specifications, professional practice, procedures, codes of ethics, pricing and intellectual property. Prerequisites: DES 494 and consent of Department. BDes students must enroll in DES 594 in second term. Note: not open to students with credit in DES 590.

#### DES 594 The Practice of Graphic Design II

★3 (fi 6) (second term, 0-6L-0). Applied practical projects and complex design systems. Problem definition, strategic planning, project management and design evaluation. Project brief and production specifications, professional practice, procedures, codes of ethics, pricing and intellectual property. Prerequisites: DES 593 and consent of Department. Note: not open to students with credit in DES 590.

#### DES 595 Communication Design for Interactive Media I

★3 (fi 6) (first term, 0-6L-0). Design issues in new communication media. Open information structures and networks as complex hierarchical systems. Internet as an information resource, research tool and mass communication media. Navigation, interaction and interface design in hypermedia. Corequisite DES 593 and Prerequisite consent of Department.

#### DES 596 Communication Design for Interactive Media II

★3 (fi 6) (second term, 0-6L-0). Design for information, education and instruction using multimedia, Navigation, interface design in the context of human-machine interaction. Complex information systems, project planning and development strategies. Prerequisite DES 593 and consent of Department and corequisite DES 594. Not open to students with credit in DES 595 prior to 2007.

#### DES 597 Design Management

★3 (fi 6) (first term, 0-6L-0). Project and office management. Design methods and evaluation, systems theory, writing for design. Introduction to marketing and social marketing, motivational and audience studies. Prerequisite or corequisite: DES 593 and consent of Department.

## Graduate Courses

#### DES 600 Concepts, Analysis and Criticism in Design I

★3 (fi 6) (first term, 0-6L-0).

#### DES 601 Concepts, Analysis and Criticism in Design II

★3 (fi 6) (second term, 0-6L-0).

#### DES 630 Seminar in Related Disciplines

★3 (fi 6) (either term, 0-3s-0).

#### DES 680 Theory and Research in Design Studies I

★3 (fi 6) (first term, 0-3s-0).

#### DES 681 Theory and Research in Design Studies II

★3 (fi 6) (second term, 0-3s-0).

#### DES 683 Seminar on Contemporary Design Issues

★3 (fi 6) (either term, 0-3s-0). Issues in the fields of theory, criticism, history, professional practice and social concerns. Restricted to Master of Design students. Prerequisite: Consent of Department.

#### DES 685 Special Topics in Design Studies

★3 (fi 6) (either term, 0-3s-0).

## 231.96 Drama, DRAMA

Department of Drama  
Faculty of Arts

**Note:** For Theatre Design courses taught by the Department of Drama please see T DES Course Listings.

## Undergraduate Courses

#### 0 DRAMA 101 Introduction to Theatre Art

★3 (fi 6) (either term, 3-0-0). The origins and development of theatre art; introduction to theatre aesthetics. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information

for students section of the Calendar. Note: Not normally to be taken by BA Drama Majors or BA (Honors) Drama students.

#### 1 DRAMA 102 Play Analysis

★3 (fi 6) (either term, 3-0-0). Understanding of Drama through critical analysis of plays and its application to creative solutions in their production. Note: Not to be taken by BA Drama Majors, BA (Honors) Drama students, or BEd (Secondary) Drama Majors.

#### DRAMA 103 Critical Analysis of Playtexts

★3 (fi 6) (either term, 3-0-0). Analysis of playtexts in reference to the specific challenges faced by actors, directors, designers, and dramaturgs. Note: Restricted to BA Drama Majors, BA (Honors) Drama students, and BEd (Secondary) Drama majors, or admission by consent of Department based on successful completion of Drama 30 or equivalent. Not to be taken by students with credit in DRAMA 102.

#### 1 DRAMA 149 Dramatic Process I

★3 (fi 6) (either term, 0-6L-0). Speech and movement improvisation with an emphasis on imaginative development; introduction to the process of acting and to dramatic form. Note: Designed for students with little or no previous background in Drama. Not to be taken by BA Drama majors, BA (Honors) Drama students, or BEd (Secondary) Drama Majors.

#### DRAMA 150 Introduction to Dramatic Process

★3 (fi 6) (first term, 0-6L-0). Dramatic improvisation as an introduction to the process of acting and to dramatic form. Prerequisite: consent of Department. Note: Restricted to BA Drama Majors, BA (Honors) Drama students, BEd (Secondary) Drama Majors, and BFA (Technical Theatre; Stage Management) students, or admission by consent of Department based on successful completion of Drama 30 or equivalent. Note: Not to be taken by students with credit in DRAMA 149.

#### DRAMA 203 Theoretical Analysis of Playtexts

★3 (fi 6) (either term, 3-0-0). A range of critical theories applied to understanding how theatre practice produces meaning. Prerequisites: one of DRAMA 102 or 103, and one of 149 or 150; or consent of Department. Note: Priority will be given to BA Drama Majors, BA (Honors) Drama students, and BEd (Secondary) Drama Majors and Minors.

#### 1 DRAMA 208 Theatre History I

★3 (fi 6) (first term, 3-0-0). Development of the styles and crafts of the mise-en-scène, and of the relationship between the playing space and the audience, in the European theatre from ancient Greece to 1650. Prerequisite: DRAMA 101 or 102 or 103 or consent of Department. Note: Required for BA Drama Majors and BA (Honors) Drama students. Not to be taken by students with credit in DRAMA 304.

#### DRAMA 209 Theatre History II

★3 (fi 6) (second term, 3-0-0). History of the European theatre from 1650 to 1900, focusing on acting styles, architecture, and conventions of production and performance. Prerequisite: DRAMA 208 or consent of Department. Note: Not to be taken by students with credit in DRAMA 304.

#### DRAMA 240 Oral Communication and Interpretation

★3 (fi 6) (either term, 0-6L-0). Voice and speech development and oral interpretation. Prerequisite: one of DRAMA 102 or 103; and one of 149 or 150; or consent of Department. Note: Restricted to BA Drama Majors, BA (Honors) Drama students, and BEd (Secondary) Drama Majors. Not to be taken by students with credit in DRAMA 247.

#### 0 DRAMA 247 Introduction to Oral Communication

★3 (fi 6) (either term, 0-6L-0). Exploration of basic techniques of oral communication and oral interpretation drawing from various forms of literature. Note: Not to be taken by BA Drama majors, BA (Honors) Drama students, or BEd (Secondary) Drama Majors.

#### DRAMA 257 Scene Study I

★3 (fi 6) (either term, 0-6L-0). Study of acting, including the analysis and enactment of scripted scenes, and characterization. Prerequisites: one of DRAMA 102 or 103 and one of 149 or 150; or consent of Department. Note: Priority will be given to BA Drama Majors, BA (Honors) Drama students, and BEd (Secondary) Drama Majors and Minors. Not to be taken by students with credit in DRAMA 353.

#### DRAMA 259 Performer-Created Theatre

★3 (fi 6) (either term, 0-6L-0). Practice in and theory of the collaborative development of dramatic performance using improvisation and other techniques. Prerequisites: DRAMA 102 or 103, and 149 or 150 or consent of Department. Note: Priority given to BA Drama Majors, BA (Honors) Drama students, and BEd (Secondary) Drama Majors. Not to be taken by students with credit in DRAMA 249 or 359.

#### DRAMA 270 Basic Theatre Design

★3 (fi 6) (first term, 0-6L-0). Study and practice of design for the theatre. Prerequisite: A Stagecraft course and consent of the department. Not to be taken by students with credit in T Des 270.

#### DRAMA 279 Introduction to Stagecraft and Design

★3 (fi 6) (either term, 3-0-0). Production techniques, construction, mechanics, lighting and design. Note: Priority given to BA Drama Majors, BA (Honors) Drama

students, and BEd (Secondary) Drama Majors and Minors. Note: Not to be taken by students with credit in DRAMA 379.

#### **DRAMA 293 Introduction to Lighting and Electrics**

★3 (*fi 6*) (either term, 0-6L-0). Restricted to BFA (Technical Theatre: Technical Production) students.

#### **DRAMA 294 Introduction to Theatre Sound**

★3 (*fi 6*) (either term, 0-6L-0). Note: Restricted to BFA (Technical Theatre: Technical Production) students.

#### **DRAMA 295 Introduction to Scenic and Stage Carpentry**

★3 (*fi 6*) (either term, 0-6L-0). Note: Restricted to BFA (Technical Theatre: Technical Production) students.

#### **DRAMA 296 Introduction to Theatre Stage Management**

★3 (*fi 6*) (first term, 0-6L-0).

#### **DRAMA 298 Stage Management in Professional Theatre**

★3 (*fi 6*) (second term, 0-6L-0). Note: Restricted to BFA Technical Theatre (Stage Management) students.

#### **DRAMA 302 Modern Canadian Theatre**

★3 (*fi 6*) (either term, 3-0-0). Development in Canadian theatre and drama since 1967. Note: Not to be taken by students with credit in DRAMA 403.

#### **DRAMA 305 Theatre and Film: From Stage to Screen**

★3 (*fi 6*) (either term, 3-0-1). An examination of problems of theatre and film adaptation, with a survey of theoretical responses, and an exploration of a number of examples from play scripts and films.

#### **DRAMA 306 Historical Approaches to Western Dramatic and Theatrical Theories**

★3 (*fi 6*) (either term, 3-0-0). Critical theories from Aristotle to Artaud. Pre- or corequisite: DRAMA 308 or consent of Department. Note: Required for BA (Honors) Drama students. Note: Not to be taken by students with credit in DRAMA 405 and 508.

#### **DRAMA 307 Studies in Drama I**

★3 (*fi 6*) (either term, 0-6L-0). Prerequisite: consent of Department.

#### **DRAMA 308 The Modernist Stage**

★3 (*fi 6*) (first term, 3-0-0). Theatre from 19th century Realism to 20th century Absurdism. Note: Required for BA (Honors) Drama students. Note: Not to be taken by students with credit in DRAMA 408.

#### **DRAMA 327 Community-Based Theatre**

★3 (*fi 6*) (either term, 0-4L-0). A study of the theory, practice and development of popular, community and collective theatre. Recommended for students who intend to enrol in DRAMA 459.

#### **DRAMA 331 Movement and Physical Theatre**

★3 (*fi 6*) (either term, 0-6L-0). An introduction to the use of improvisational movement in the creation of physical theatre. Prerequisite: DRAMA 149 or 150 or consent of the Department. Note: Priority will be given to BA Drama Majors, BA (Honors) Drama students, and BEd (Secondary) Drama Majors.

#### **DRAMA 334 Beginning Movement**

★6 (*fi 12*) (two term, 0-8L-0). Techniques in ballet and period style for the actor. Exploration of creative forms of movement and the physical self in characterization. Note: Restricted to BFA Acting. Not to be taken by students with credit in DRAMA 336 or 338.

#### **DRAMA 335 Movement in Rehearsal and Performance**

★2 (*fi 4*) (two term, 0-0-1). Restricted to BFA (Acting) students. This is a credit-fail course.

#### **DRAMA 344 Voice and Speech**

★6 (*fi 12*) (two term, 0-8L-0). Introduction to voice and speech improvement; oral interpretation; exploration of the voice for characterization; singing. Note: Restricted to BFA Acting students. Not to be taken by students with credit in DRAMA 346 or 348.

#### **DRAMA 345 Speech in Rehearsal and Performance**

★2 (*fi 4*) (two term, 0-0-1). Note: Restricted to BFA Acting students. This is a credit-fail course.

#### **DRAMA 355 Acting in Rehearsal and Performance**

★2 (*fi 4*) (two term, 0-0-3). Note: Restricted to BFA Acting students.

#### **DRAMA 356 Beginning Acting Technique I**

★3 (*fi 6*) (first term, 0-10L-0). Development of the self as the fundamental instrument of the actor. Introduction to script analysis and scene study. Note: Restricted to BFA (Acting) students.

#### **DRAMA 357 Scene Study II**

★3 (*fi 6*) (either term, 0-6L-0). Acting exercises based on the study of plays emphasizing complexity of language and characterization. Prerequisites: DRAMA 102 or 103, and 240 and 257, and a Theatre History course from the Department of Drama course listings; and/or consent of Department. Note: Not to be taken by students with credit in DRAMA 453.

#### **DRAMA 358 Beginning Acting Technique II**

★3 (*fi 6*) (second term, 0-10L-0). Script analysis, characterization, and the laboratory exploration of scenes and/or plays drawn from Realism. Prerequisite: DRAMA 356. Note: Restricted to BFA (Acting) students.

#### **DRAMA 361 Playwriting**

★3 (*fi 6*) (first term, 0-6L-0). Study of and practice in the creation of a play for the theatre. Prerequisite: DRAMA 101 or one of DRAMA 102, 103, 149, or 150 or consent of Department. Note: Not to be taken by students with credit in DRAMA 360 or 407 in playwriting.

#### **DRAMA 383 Introduction to Directing**

★3 (*fi 6*) (either term, 0-6L-0). Fundamentals of directing explored through practical exercises. Prerequisites: One of DRAMA 257, 370, 378 and/or consent of Department. Note: Priority given to BA Drama Majors, BA (Honors) Drama students, BEd (Secondary) Drama Majors, and BFA (Theatre Design; Technical Theatre; Stage Management) students.

#### **DRAMA 390 Production Crew I**

★3 (*fi 6*) (variable, 0-8L-0). Production experience in the preparation for and the running of a production for performance. Note: Restricted to BFA (Technical Theatre) students.

#### **DRAMA 391 Production Lab I**

★3 (*fi 6*) (either term, 0-8L-0). Technical theatre practice. Preparation and running of the production aspects of Departmental plays. Prerequisite: DRAMA 279 or consent of Department. Note: Not to be taken by students with credit in DRAMA 191.

#### **DRAMA 392 Production Lab II**

★3 (*fi 6*) (variable, 0-0-6). Production experience in stage managing and/or technical theatre with qualified technical experts. Prerequisites: DRAMA 191, 391, and/or consent of Department.

#### **DRAMA 393 Production Lab II B**

★2 (*fi 4*) (first term, 0-0-2). Production organization; experience in running of a play in performance. Restricted to BFA (Acting) students. A required non-credit course.

#### **DRAMA 394 Production Techniques - Sound**

★3 (*fi 6*) (second term, 0-6L-0). Theory and practical application of audio equipment and sound design for the theatre. Note: Restricted to BFA Drama (Technical Theatre) students.

#### **DRAMA 399 Explorations in Acting I**

★3 (*fi 6*) (two term, 0-3L-0). Exploration of dramatic text using exercises devoted to the coordination of the actor's voice, speech and movement. Restricted to BFA (Acting) students. Course grading criterion is in terms of 'credit/non-credit' only.

#### **DRAMA 401 Research and Critical Writing Skills**

★3 (*fi 6*) (first term, 0-3L-0). Prerequisite: DRAMA 306. Note: Required for BA (Honors) students.

#### **DRAMA 402 Tutorial Fourth-Year Honors Essay**

★3 (*fi 6*) (second term, unassigned). Prerequisite: DRAMA 401. Note: Not to be taken by students with credit in DRAMA 505.

#### **DRAMA 406 Contemporary Approaches to Dramatic and Theatrical Theories**

★3 (*fi 6*) (either term, 3-0-0). Modernist to contemporary theories applied to dramatic texts in performance. Prerequisite: consent of Department. Note: Required for BA (Honors) Drama students. Not to be taken by students with credit in DRAMA 503 and 509.

#### **DRAMA 407 Studies in Drama II**

★3 (*fi 6*) (either term, 0-6L-0). Prerequisite: consent of Department.

#### **DRAMA 409 Contemporary Theatre**

★3 (*fi 6*) (either term, 3-0-0). Exploration of issues and trends of theatre movements which form the mosaic of contemporary theatre. Prerequisite: A Theatre History course from the Department of Drama course listings, or consent of Department.

#### **DRAMA 434 Theatre Movement**

★6 (*fi 12*) (two term, 0-8L-0). Studies of, and projects in styles of movement and dance, both period and contemporary. Prerequisite: DRAMA 334. Note: Restricted to BFA Acting students. Not to be taken by students with credit in DRAMA 436 or 438.

#### **DRAMA 435 Movement in Rehearsal and Performance**

★2 (*fi 4*) (two term, 0-0-2). Note: Restricted to BFA Acting students. This is a credit-fail course.

#### **DRAMA 444 Advanced Voice and Speech**

★6 (*fi 12*) (two term, 0-6.5L-0). Extension of the voice; sight reading, oral interpretation of period dramatic forms; singing. Prerequisite: DRAMA 344. Note: Restricted to BFA Acting students. Not to be taken by students with credit in DRAMA 446 or 448.



**DRAMA 445 Speech in Rehearsal and Performance**

★2 (*fi 4*) (two term, 0-0-2). Note: Restricted to BFA (Acting) students. This is a credit-fail course.

**DRAMA 451 Make-up for the Stage**

★2 (*fi 4*) (first term, 0-3L-0). Practice in use of basic and special materials in creating character make-up for the stage. Note: Restricted to BFA (Drama) and BMus (Voice) students. Not open to students with credit in DRAMA 351 or 551. This is a credit/fail course.

**DRAMA 452 Solo Performance**

★3 (*fi 6*) (either term, 0-6L-0). Advanced theatrical tools to create and present original solo performance. Prerequisite: DRAMA 257 and 259, and/or consent of Department.

**DRAMA 453 Physical Comedy**

★3 (*fi 6*) (either term, 0-6L-0). The exploration and practice of physical comedy styles through clown, bouffon, and mask. Prerequisite: DRAMA 259 and 331, and/or consent of Department.

**DRAMA 454 Performance Creation**

★3 (*fi 6*) (either term, 0-6L-0). Exploration, practice, and experimentation in performer-created theatre. Prerequisite: DRAMA 259 and/or consent of Department.

**DRAMA 455 Acting in Rehearsal and Performance**

★3 (*fi 6*) (two term, 0-4L-0). Note: Restricted to BFA Acting students.

**DRAMA 456 Advanced Acting Technique I**

★3 (*fi 6*) (first term, 0-10L-0). Studies in characterization leading to laboratory performance. Prerequisite: DRAMA 358. Note: Restricted to BFA (Acting) students.

**DRAMA 457 Production/Performance**

★6 (*fi 12*) (either term, 0-8L-0). Research, rehearsal, design, staging and presentation of a play by an acting ensemble. Prerequisites: DRAMA 357 and 391, a Theatre History course from the Department of Drama course listings, and/or consent of Department.

**DRAMA 458 Advanced Acting Technique II**

★3 (*fi 6*) (second term, 0-10L-0). Study of, and practice in, the main period styles of acting. Prerequisite: DRAMA 456. Note: Restricted to BFA (Acting) students.

**DRAMA 459 Collective Creation**

★3 (*fi 6*) (either term, 0-6L-0). The collaborative preparation and presentation of performer-created theatre within a social context. Prerequisite: DRAMA 259 and/or consent of Department. DRAMA 327 is recommended.

**DRAMA 461 Script Writing**

★3 (*fi 6*) (second term, 0-6L-0). The theory and practice of writing for dramatic media: theatre, film, radio, or television. Prerequisite: DRAMA 361 and consent of Department. Note: Not to be taken by students with credit in DRAMA 460.

**DRAMA 483 Elements of Directing**

★3 (*fi 6*) (either term, 0-6L-0). Developing the director's creative use of the elements of directing through practical exercises in scripted scenes. Prerequisites: DRAMA 102 or 103, 383 and 391, and/or consent of Department.

**DRAMA 490 Production Crew II**

★3 (*fi 6*) (variable, 0-8L-0). Production experience in the preparation for and/or the running of a production for performance. Prerequisite: DRAMA 390. Note: Restricted to BFA (Technical Theatre) students.

**DRAMA 492 Running Crew Projects**

★3 (*fi 6*) (either term, 0-0-6). Production organization: experience in preparing and running of a play in performance. Prerequisites: DRAMA 191, or 391 and/or consent of Department.

**DRAMA 493 Advanced Stage Lighting Electrics**

★3 (*fi 6*) (either term, 0-6L-0). Note: Restricted to BFA (Technical Theatre: Technical Production) students.

**DRAMA 494 Specialized Skills in Stage Management**

★3 (*fi 6*) (either term, 0-6L-0). Skill sets for the practice of Stage Management. Note: Restricted to BFA Technical Theatre (Stage Management) students. Repeatable (to be taken two years in succession).

**DRAMA 495 Management-Practices for Technical Theatre**

★3 (*fi 6*) (either term, 4-0-0). Administrative practice directed toward production shop facilities and personnel. Note: Restricted to BFA (Technical Theatre) students.

**DRAMA 497 Workshops in Technical Theatre**

★6 (*fi 12*) (two term, 0-10L-0). Technical production techniques and practice (i.e., health and safety, rigging, flying, rolling stock and tracked stages, hydraulics, pneumatics, plastics and metal fabrication, etc.). Prerequisite: DRAMA 397. Note: Restricted to BFA (Technical Theatre: Technical Production) students. Repeatable (to be taken two years in succession).

**DRAMA 499 Explorations in Acting II**

★3 (*fi 6*) (two term, 0-3L-0). Exploration of dramatic text related to period style

with emphasis on characterization, and special problems. Prerequisite: DRAMA 399. Restricted to BFA (Acting) students. Course grading criterion is in terms of 'credit/no credit' only.

**DRAMA 507 Senior Projects**

★3 (*fi 6*) (either term, 0-6L-0). Prerequisite: consent of Department.

**DRAMA 534 Advanced Movement**

★6 (*fi 12*) (two term, 0-6L-0). Instruction and projects for individual growth in movement expression. Prerequisite: DRAMA 438. Note: Restricted to BFA (Drama) students.

**DRAMA 535 Movement in Rehearsal and Performance**

★3 (*fi 6*) (two term, 0-0-3). Note: Restricted to BFA Acting students. This is a credit-fail course.

**DRAMA 544 Dialects and Accents/Language Styles**

★6 (*fi 12*) (two term, 0-7L-0). Survey of dialects and accents; intensive practice in representative examples from the British Isles, Europe and North America; tutorial instruction to suit the actor's vocal needs; singing. Prerequisite: DRAMA 448. Note: Restricted to BFA (Drama) students.

**DRAMA 545 Speech in Rehearsal and Performance**

★3 (*fi 6*) (two term, 0-0-3). Note: Restricted to BFA Acting students. This is a credit-fail course.

**DRAMA 554 Rehearsal and Performance**

★6 (*fi 12*) (two term, 0-25L-0). Rehearsal and performance of roles in public production. Workshops in acting for film and radio. Prerequisite: DRAMA 458. Note: Restricted to BFA (Acting) students.

**DRAMA 577 Special Projects**

★3 (*fi 6*) (either term, 0-6L-0). Special projects in design and production. Formerly part of DRAMA 507.

**DRAMA 590 Production Crew III**

★6 (*fi 12*) (two term, 0-15L-0). Production experience in preparing and/or running of a production for performance. Prerequisite: DRAMA 490. Note: Restricted to BFA (Technical Theatre) students. Repeatable.

**DRAMA 599 Explorations in Acting III**

★2 (*fi 4*) (either term, 0-2L-0). Prerequisite: DRAMA 499. Restricted to BFA (Acting) students. Course grading criterion is in terms of 'credit/no credit' only.

**Graduate Courses****DRAMA 595 Professional Orientation for Theatre Artists**

★0 (*fi 2*) (either term, 2-0-0). Preparing the artist for developing a career in professional theatre. Required for graduation for BFA in Acting, Stage Management, Technical Theatre and Design students.

**DRAMA 596 Advanced Stage Management**

★3 (*fi 6*) (either term, 0-6L-0). Stage management practice as it applies to different types of production. Prerequisite: DRAMA 396. Note: Restricted to BFA Technical Theatre (Stage Management) students. Repeatable (to be taken two years in succession).

**DRAMA 601 Methods and Tools of Research**

★3 (*fi 6*) (either term, 0-3L-0).

**DRAMA 605 Special Projects in Theatre**

★3 (*fi 6*) (variable, 0-3L-0). Prerequisite: consent of Department.

**DRAMA 606 Special Projects in Theatre Practice**

★3 (*fi 6*) (variable, 0-3L-0). Normally restricted to MFA Theatre Practice students. Prerequisite: consent of Department.

**DRAMA 607 Dramaturgy I**

★3 (*fi 6*) (variable, 0-3s-0).

**DRAMA 608 Historical Approaches to Dramatic and Theatrical Critical Theories**

★3 (*fi 6*) (either term, 0-3s-0). An in-depth analysis of selected theories of aesthetics, drama and theatre, from Aristotle to Modernism.

**DRAMA 609 Contemporary Approaches to Dramatic and Theatrical Critical Theories**

★3 (*fi 6*) (either term, 0-3s-0). An in-depth analysis of selected contemporary theories of aesthetics, drama and theatre, from Structuralism to the present.

**DRAMA 617 Dramaturgy II**

★3 (*fi 6*) (variable, 0-9L-0). Practical studies in dramaturgy. Prerequisites: DRAMA 607 and/or consent of Department.

**DRAMA 621 Research Seminar I**

★3 (*fi 6*) (either term, 0-3s-0). Selected topics in Theory and Criticism.

**DRAMA 622 Research Seminar II**

★3 (*fi 6*) (either term, 0-3s-0). Selected topics in Theory and Criticism.

**DRAMA 623 Research Seminar III**

★3 (*fi 6*) (either term, 0-3s-0). Selected topics in Theatre History and Theatrical Theory.

**DRAMA 624 Research Seminar IV**

★3 (*fi 6*) (either term, 0-3s-0). Selected topics in Theatre History and Theatrical Theory.

**DRAMA 625 Research in Canadian Drama I**

★3 (*fi 6*) (either term, 0-3s-0). Research in selected topics related to Canadian Drama.

**DRAMA 626 Research in Canadian Drama II**

★3 (*fi 6*) (either term, 0-3s-0). Research in selected topics related to Canadian Drama.

**DRAMA 640 Voice Pedagogy I**

★3 (*fi 6*) (variable, 0-9L-0). Study of theory and pedagogical approaches to teaching voice, speech and text for the theatre.

**DRAMA 641 Voice Pedagogy II**

★3 (*fi 6*) (variable, 0-9L-0). Advanced study of theory and pedagogical approaches to teaching and coaching voice, speech and text for the theatre, and for presentation skills. Prerequisite: DRAMA 640.

**DRAMA 642 Vocal Coaching for the Theatre I**

★3 (*fi 6*) (either term, 0-12L-0). Observation and analysis of approaches to coaching voice, speech and text for the theatre.

**DRAMA 643 Vocal Coaching for the Theatre II**

★3 (*fi 6*) (either term, 0-12L-0). Advanced observation, analysis and supervised teaching and coaching of voice, speech and text for the theatre and for presentation skills. Prerequisite: DRAMA 642.

**DRAMA 644 Vocal Coaching for the Theatre III**

★3 (*fi 6*) (either term, 0-12L-0). Supervised and independent teaching and coaching of voice, speech and text for the theatre and for presentation skills. Prerequisite: DRAMA 643.

**DRAMA 659 Popular Theatre: Theory and Methodology**

★3 (*fi 6*) (either term, 0-9L-0). This course will examine the principles on which popular theatre rests, the objectives of popular theatre, various approaches to popular theatre, and evaluation of popular theatre. Students will examine these topics through a mix of academic study, practical introduction of specific popular theatre techniques, and an experience in a popular theatre process. Prerequisite: consent of Department.

**DRAMA 683 Styles of Directing I**

★3 (*fi 6*) (either term, 0-3s-6). Note: Restricted to MFA (Drama) students. Not to be taken by students with credit in DRAMA 680.

**DRAMA 684 Styles of Directing II**

★3 (*fi 6*) (either term, 0-3s-6). Note: Restricted to MFA (Drama) students. Not to be taken by students with credit in DRAMA 680.

**DRAMA 685 Advanced Projects in Directing I**

★3 (*fi 6*) (either term, 0-3s-6). Note: Restricted to MFA (Drama) students. Not to be taken by students with credit in DRAMA 681.

**DRAMA 686 Advanced Projects in Directing II: New Play Dramaturgy**

★3 (*fi 6*) (either term, 0-3s-6). Note: Restricted to MFA (Drama) and MA (Drama) students. Not to be taken by students with credit in DRAMA 681.

**DRAMA 690 Topics in Applied Theatre Aesthetics**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: consent of Department.

**DRAMA 695 Final Research Project (Course Based Masters)**

★0 (*fi 1*) (either term, unassigned). Public presentation of final research project. This is a pass/fail course.

## 231.97 Earth and Atmospheric Sciences, EAS

Department of Earth and Atmospheric Sciences  
Faculty of Science

### Undergraduate Courses

#### 231.97.1 Faculty of Arts Courses

**0 EAS 192 Cultures, Landscapes and Geographic Space**

★3 (*fi 6*) (either term, 3-0-0). Introduction to geographical techniques and the spatial organization of human landscapes and significance of the distribution of human activity. Not open to students with credit in EAS 190 or 191. [Faculty of Arts]

**0 EAS 293 The Urban Environment**

★3 (*fi 6*) (either term, 3-0-0). Introduction to urban geography emphasizing interactions between the physical environment and patterns of human settlement. Topics include models of urbanization and urban form, growth and decline in North American cities. Prerequisite: Any ★3 course. [Faculty of Arts]

**0 EAS 294 Natural Resources and Environmental Management**

★3 (*fi 6*) (either term, 3-0-0). Geographic concepts and perspectives on renewable and non-renewable natural resources. Prerequisite: Any ★3 course. Not to be taken by students with credit in EAS 290 or 291. [Faculty of Arts]

**0 EAS 295 Human Dimensions of Environmental Hazards**

★3 (*fi 6*) (either term, 3-0-0). Interactions between environmental hazards, individuals and communities; risk reduction strategies by members of the public and management agencies. Prerequisite: Any ★3 course. [Faculty of Arts]

**0 EAS 296 Planning Theory and Practice**

★3 (*fi 6*) (either term, 3-0-0). An introduction to planning theory and practice focusing on rural, urban and environmental topics. Prerequisite: Any ★3 course. [Faculty of Arts]

**0 EAS 391 Introduction to Environmental Planning**

★3 (*fi 6*) (either term, 2-1s-0). Introduction to issues in policy making, planning and management related to human interaction with the physical environment. Prerequisite: EAS 192 or any EAS 29X course. [Faculty of Arts]

**0 EAS 392 Research Methods in Human Geography**

★3 (*fi 6*) (either term, 3-0-0). Collection and analysis of data for research in human geography. Research design and sampling procedures. Special emphasis on social surveys, analysis and interpretation of quantitative data, and report writing. Field work required. Prerequisites: Any three EAS X9X courses. [Faculty of Arts]

**0 EAS 393 Introduction to Social and Cultural Geography**

★3 (*fi 6*) (either term, 3-0-0). Connections between space, society and culture at multiple scales. Formation and significance of cultural landscapes, and shaping of social life by spatial arrangements. Prerequisite: EAS 192 and any one EAS 29X course. [Faculty of Arts]

**0 EAS 394 Issues In Human Geography**

★3 (*fi 6*) (either term, 3-0-0). Theory and application of contemporary issues in human geography. Prerequisites: EAS 192 and one EAS 29X course. Topics vary; may be taken more than once for credit provided no topic is repeated. [Faculty of Arts]

**0 EAS 395 Health, Space and Place**

★3 (*fi 6*) (either term, 2-1s-0). Geographic research on health and disease, including environmental, social, individual and institutional factors. Prerequisites: Any 100-level human geography (19X) course plus any one 200-level (29X) human geography course. [Faculty of Arts]

**0 EAS 396 The Spatial Economy**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the study of the location, distribution and spatial organization of economic activities on both the local and the international scale. EAS 192 and any one EAS 29X course. [Faculty of Arts]

**0 EAS 397 Topics in Regional Geography**

★3 (*fi 6*) (either term, 3-0-0). Selected regions are studied in a regional or topical format. Topics vary; may be taken more than once for credit provided no topic is repeated. [Faculty of Arts]

**0 EAS 491 Resource Management and Environmental Policy**

★3 (*fi 6*) (either term, 3-0-0). Roles of governmental and nongovernmental organizations, industry and private enterprise, and advocacy organizations in addressing issues of resource scarcity and environmental policy. Institutions, policies, and strategies for resource and environmental management at the provincial/state, national, and international levels. Prerequisites: EAS 294. [Faculty of Arts]

**0 EAS 492 Geographical Information Systems for Social Science**

★3 (*fi 6*) (either term, 2-0-1). This course provides spatial analytic tools to social geographers and provides a social science perspective to geoprocessing students. Examples arise from marketing, operations research, sociology, and urban and economic geography. Assignments impart technical aspects through hands-on experience with commercial and in-house spatial analysis software. Prerequisite: EAS 221. [Faculty of Arts]

**0 EAS 493 Human Dimensions of Environmental Change**

★3 (*fi 6*) (either term, 3-0-0). Investigation of issues related to the human use of resources and impact on the regional and global environment. Critical review of current frameworks for assessing, mitigating and adapting to global environmental change. Prerequisite: Any EAS 3XX course or consent of Instructor. [Faculty of Arts]

**0 EAS 494 Environment and Health**

★3 (*fi 6*) (either term, 3-0-0). An examination of relations between human health and environmental issues, particularly those related to the natural, built, and social environments. Prerequisite: EAS 395. [Faculty of Arts]

**0 EAS 495 Advanced Issues in Human Geography**

★3 (*fi 6*) (either term, 3-0-0). Advanced theory and application of contemporary issues in human geography. Prerequisite: EAS 192 and any one EAS 29X course. Topics vary; may be taken more than once for credit provided no topic is repeated. [Faculty of Arts]

**EAS 497 Directed Study in Human Geography I**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Any EAS 39X course. [Faculty of Arts]

**EAS 498 Directed Study in Human Geography II**

★3 (fi 6) (either term, 3-0-0). Prerequisite: EAS 497. [Faculty of Arts]

**EAS 499 Practical Study in Human Geography**

★3 (fi 6) (variable, 10 - 15 days). Intensive field or practical study in Human Geography, typically as part of a team working off-campus. Details and areas of study may vary from year to year; consult the department about current offerings, fees and timing. Prerequisite: Any EAS 29X course and Consent of the Instructor. Topics vary; may be taken more than once for credit provided no topic is repeated. This course may require the payment of additional fees. [Faculty of Arts] Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**EAS 595 Advanced Issues in Human Geography**

★3 (fi 6) (either term, 3-0-0). Advanced theory and application of contemporary issues in human geography. Topics vary; may be taken more than once for credit provided no topic is repeated. Classes concurrent with EAS 495. [Faculty of Arts]

**231.97.2 Faculty of Science Courses****Notes**

- (1) Students are responsible for their own accommodation and meal expenses on all Earth and Atmospheric Sciences field trips.
- (2) List of paleontology courses and course descriptions may be found under Paleontology.

**0 EAS 100 Planet Earth**

★3 (fi 6) (either term, 3-0-3). Introduction to the origin and evolution of the Earth and the solar system. Introduction to plate tectonics and the rock cycle. Simple energy balances and interactions between radiation and the atmosphere, land, oceans, ice masses, and the global hydrological cycle. Evolution of life, biogeography, and global climate in the context of geologic time. The carbon cycle. Human interaction with the Earth. Mineral and energy resources. Not available to students with credit in EAS 101, 102 or 201 or SCI 100 (Note: Students with credit in EAS 201 may take EAS 200.). [Faculty of Science]

**0 EAS 105 The Dynamic Earth Through Time**

★3 (fi 6) (either term, 3-0-3). The plate tectonic framework of a dynamic Earth as it relates to the origin of major groups of minerals and rocks. Earthquakes, structural geology, and the origin of mountain belts. Surface processes and their sedimentary products. History of life and extinctions. Not available to students with credit in EAS 101, 210 or SCI 100. Prerequisite: EAS 100 or 102. [Faculty of Science]

**EAS 110 Earth Science Field School**

★3 (fi 6) (second term, 7 days). This excursion through the mountains and prairies of Alberta is designed to demonstrate the diverse geomorphology and landscape of the province and to observe the various rock types that make up the geological column from the Precambrian to the Recent, including the widespread glacial deposits. In addition, the structure of the rocks will be observed and discussed, fossils will be identified, and tours to various mines and damsites will be conducted. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisite: One of EAS 100, 101, 210 or SCI 100. [Faculty of Science]

**0 EAS 200 Introductory Studies in Earth Science**

★1 (fi 2) (either term, 0-0-3). Laboratory study of topics in introductory Earth Science. EAS 200 and EAS 201 are considered to be equivalent to EAS 100 for prerequisite purposes. Not available to students with credit in EAS 100, 101, EAS 210 or SCI 100. Co- or prerequisite: EAS 201. [Faculty of Science]

**0 EAS 201 Earth Science I**

★3 (fi 6) (either term, 3-0-0). A non-laboratory introduction to the origin and evolution of the Earth and the solar system. Introduction to plate tectonics and the rock cycle. Simple energy balances and interactions between radiation and the atmosphere, land, oceans, ice masses, and the global hydrological cycle. Evolution of life, biogeography, and global climate in the context of geologic time. The carbon cycle. Human interactions with the Earth. Mineral and energy resources. Not available to students with credit in EAS 100, 101, 102, 210 or SCI 100. (Note: EAS 201 and EAS 200 are considered to be equivalent to EAS 100 for prerequisite purposes). [Faculty of Science]

**0 EAS 202 Violent Weather**

★3 (fi 6) (either term, 3-0-0). A survey of severe and unusual weather, with emphasis on tornadoes, hurricanes, hail and lightning. The scientific basis for the occurrence of these phenomena is presented along with practical precautions which may be taken to minimize their danger. Computer simulation and videos are used to illustrate how the weather systems work. Prerequisite: Any 100-level Science course. [Faculty of Science]

**0 EAS 204 Environment Alberta**

★3 (fi 6) (either term, 3-0-0). The physical environment of Alberta. Regional variation in the patterns of climate, landforms, water, soils, vegetation and wildlife; the geographic synthesis of these patterns to give a broad understanding and

appreciation of the province and its environmental problems. Prerequisite: One of EAS 100, 101, 102, 201, 210 or SCI 100. [Faculty of Science]

**0 EAS 205 Environment Earth**

★3 (fi 6) (either term, 3-0-0). General introduction to interactions between people and their natural environment, with an emphasis on geological processes. Topics include: soil resources and degradation; earthquakes and volcanoes; streams and flooding; landslides, mass movement and subsidence, shoreline development and coastal processes; surface water and groundwater resources; air and water pollution; waste management and disposal; and global change. Prerequisite: Any 100-level Science course. [Faculty of Science]

**0 EAS 206 Geology of the Solar System**

★3 (fi 6) (either term, 3-0-0). Origin of the elements and the solar system, origin and evolution of the planets. Geologic and atmospheric properties of the planets, the nature of meteorites and comets. Results of recent space exploration. Prerequisite: Any 100-level or higher Science course. [Faculty of Science]

**0 EAS 207 Mass Extinctions and Dinosaurs**

★3 (fi 6) (either term, 3-0-0). A discussion and description of the progression of life through time, with emphasis on important radiations and mass extinctions of life, and theories on why they occur. Evolution, radiation, morphology and life habits of dinosaurs are considered in detail. The evidence for asteroid impacts in the geologic record, their frequency and effect on the history of organisms through time. Origin and evolution of humans, and their impact on the biosphere. Prerequisite: Any 100-level Science course. [Faculty of Science]

**0 EAS 208 Introduction to Global Change**

★3 (fi 6) (either term, 3-0-0). Natural and anthropogenic causes of global scale environmental change; the role of the atmosphere, oceans, biosphere and cryosphere in the processes of environmental change; relationships between levels of technology and development and the character of environmental change associated with human activity. Prerequisite: Any 100-level Science course. [Faculty of Science]

**0 EAS 209 Geology of Western Canada and the National and Provincial Parks**

★3 (fi 6) (either term, 3-0-0). An overview of the geology and landscapes of Western Canada. The spectacularly exposed rocks of the prairie and mountain parks of Alberta and British Columbia will be fitted into a regional geological framework and examples from parks such as Yoho, Banff, Jasper, Dinosaur, and Kananaskis will be highlighted. Geological processes of mountain building and past and present landscape evolution will be emphasized. Prerequisite: One of EAS 100, 101, 103, 105, 201, 210 or SCI 100. [Faculty of Science]

**EAS 210 Engineering Earth Science**

★4.5 (fi 6) (first term, 3-0-3). Rock-forming minerals, origins of igneous, metamorphic and sedimentary rocks; economic minerals and ore deposits; rock weathering and soil formation, mass-wasting, groundwater, deformation of the earth's crust. Laboratories on identification of minerals and rocks and the interpretation of topographic and geologic maps and aerial photography. Prerequisite: Any 100-level Science course. Not available to students with credit in EAS 101, 105, or SCI 100. Intended for students in Engineering programs. Restricted to students in Engineering programs. [Faculty of Science]

**0 EAS 212 The Oceans**

★3 (fi 6) (either term, 3-0-0). An introduction to the physics and chemistry of the oceans. Topics covered include ocean currents, the ocean floor, origins and buffering of the chemistry of the oceans. The role of the oceans in determining past and present climates is introduced. Prerequisite: Any 100-level Science course. [Faculty of Science]

**0 EAS 221 Introduction to Geographical Information Systems and Remote Sensing**

★3 (fi 6) (either term, 3-0-3). Background to the principles of Geographic Information Systems and Remote Sensing. Lectures emphasize the theoretical and methodological underpinnings, labs impart the technical aspects through hands-on experience with appropriate software. Prerequisite: Any 100-level Science course. [Faculty of Science]

**EAS 222 Stratigraphy and Sedimentation**

★3 (fi 6) (either term, 3-0-3). Origin of sedimentary materials; sedimentary processes; sedimentary structures, textures, and flow regimes; properties and classification of clastic and non-clastic rocks; sedimentary environments and facies in non-marine, coastal and marine settings; principles of stratigraphy, stratigraphic nomenclature and the stratigraphic column. Prerequisite: One of EAS 101, 103, 105 or 210. [Faculty of Science]

**0 EAS 224 Mineralogy I**

★3 (fi 6) (either term, 3-0-3). Principles of crystallography, physical and chemical properties of minerals, determinative mineralogy. Prerequisite: EAS 101, 105, 210 or SCI 100. [Faculty of Science]

**0 EAS 225 Earth Surface Processes and Landforms**

★3 (fi 6) (either term, 3-0-3). Geomorphological processes and landform analysis with special reference to the landscape of Alberta. Fieldwork required. Prerequisite: One of EAS 100, 101, 102, 201, 210 or SCI 100. [Faculty of Science]



**0 EAS 230 Introduction to Invertebrate Paleontology**

★3 (*fi 6*) (either term, 3-0-3). Systematics of important groups of invertebrate fossils. Introduction to biostratigraphy, paleoecology, and the study of mass extinctions and faunal radiations. Mechanisms and patterns of evolution. Groups covered include: Porifera, Cnidaria, Brachiopoda, Mollusca, Trilobita, Echinodermata, and some microfossil groups. Prerequisite: EAS 103, 105 or SCI 100. [Faculty of Science]

**0 EAS 232 Mineralogy II**

★3 (*fi 6*) (either term, 3-0-3). Optical techniques in determinative mineralogy with particular emphasis on transmitted-light microscopy and its application to common rock-forming minerals. Mineral associations, textures and elementary ideas on the origin of igneous, metamorphic and sedimentary rocks. Prerequisite: EAS 224. [Faculty of Science]

**0 EAS 233 Geologic Structures**

★3 (*fi 6*) (either term, 3-0-3). Orientation, measurement description, and analysis of planar and linear structures in rocks, including folds, faults, and fabrics. Introduction to mapping and the collection of structural information. Construction of geologic maps and cross-sections. Introduction to stereographic and equal-area projections. Basic concepts of strain and stress in rock deformation. Prerequisite: EAS 105, 210 or SCI 100. [Faculty of Science]

**EAS 234 Geology Field School**

★3 (*fi 6*) (second term). A geological investigation of the Jasper area with emphasis on stratigraphy and properties of sedimentary rocks, paleontology, structural and Quaternary mapping, and Cordilleran tectonics. Field exercises teach the fundamentals of recording field data, aerial photograph interpretation, reconstructing depositional environments, and tectonic syntheses. This field school is run immediately following the Winter examination period. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisites: EAS 233, and one of EAS 222, 235 or 236. [Faculty of Science]

**0 EAS 250 Biogeography**

★3 (*fi 6*) (either term, 3-0-3). The links between geomorphology and plant-animal environments will be covered through a biogeographical approach to ecological studies. Studies of the winter environment and the ecological role of snow. Plains and alpine field trips. "Requires payment of additional student instructional support fees. "Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisite: EAS 100, 102, BIOL 108 or SCI 100. [Faculty of Science]

**0 EAS 270 The Atmosphere**

★3 (*fi 6*) (either term, 3-0-0). An introduction to weather and climate. Atmospheric composition, temperature, humidity, wind, clouds; air masses, fronts, storms; weather forecasting. Weather map discussions. Prerequisite: Any 100-level Mathematics, Physics or Chemistry course, or EAS 100, 102 or SCI 100. [Faculty of Science]

**EAS 275 Physical Basis of Atmosphere/Ocean Sciences**

★3 (*fi 6*) (either term, 3-0-0). The description of the properties of air and water and their dynamics in natural environments through the use of physical and mathematical models. Specific topics include constitutive relations of fluids; pressure, buoyancy and Coriolis forces; derivation and approximations of the conservation laws for mass, momentum and energy; mathematical representation of waves, dispersion relations and transport. Prerequisites: MATH 113 or 114 and 214 or equivalent, and PHYS 144 and 146. [Faculty of Science]

**0 EAS 320 Geochemistry I**

★3 (*fi 6*) (either term, 3-0-3). A survey of chemical processes occurring in geological settings with emphasis on the principles governing the migration and distribution of the elements and isotopes in the earth. Thermodynamics applied to aqueous systems. Introduction to organic geochemistry and global geochemical cycles. Prerequisite: CHEM 101 and CHEM 102 and EAS 224. SCI 100 may be used in lieu of CHEM 101, 102. [Faculty of Science]

**0 EAS 323 Introduction to Hydrogeology**

★3 (*fi 6*) (either term, 3-0-3). The hydrologic cycle, water budgets and basic hydrologic processes; physical properties of porous media and groundwater flow principles; steady-state groundwater flow; transient groundwater flow, well hydraulics and groundwater resource evaluation; regional groundwater flow; and, basic hydrochemistry and transport processes. Prerequisites: One of EAS 100, 101, 102, 201 or 210 and MATH 113 or 114, PHYS 124 or 144, and one of PHYS 126, 130, or 146. SCI 100 may be used in lieu of EAS 100, MATH 114, PHYS 144 and 146. Not available to students with credit in EAS 223. [Faculty of Science]

**0 EAS 324 Quaternary Geoscience and Terrain Analysis**

★3 (*fi 6*) (either term, 3-0-3). Quaternary geoscience and applied geomorphology, including dating methods, stratigraphy and paleoclimates. Fundamentals of interpretation and mapping of surficial geology and geomorphology from aerial photographs and satellite images with a focus on western Canada. Some field work may be required. Prerequisites: EAS 221 and 225. [Faculty of Science]

**EAS 327 Environmental Instrumentation**

★3 (*fi 6*) (either term, 3-0-2). Laboratory work and lectures to develop skills in environmental measurement through comprehension of first principles. Instrumentation (basic electronics; matching signal sources and receivers; noise; frequency response). Sensor-environment coupling (heat and mass transfer).

Sampling theory. Principles will be applied to selected environmental monitoring instruments. Field trip. Prerequisites: EAS 100 or 102 and MATH 113. SCI 100 may be used in lieu of EAS 100 and MATH 114. [Faculty of Science]

**0 EAS 331 Igneous Petrology**

★3 (*fi 6*) (either term, 3-0-3). A survey of igneous rocks from the ocean basins and the continents; their field settings, classification, petrography, mineralogy and chemistry; magmatic processes and petrogenesis; problem solving and laboratory work on major rock suites. Prerequisites: CHEM 102 or SCI 100 and EAS 232 and prerequisite or corequisite EAS 320. [Faculty of Science]

**0 EAS 332 Metamorphic Petrology**

★3 (*fi 6*) (either term, 3-0-3). An introduction to the classification and genesis of metamorphic rocks in light of field, petrographic and geochemical data. Prerequisites: EAS 320 and 331 or consent of the instructor. [Faculty of Science]

**EAS 333 Advanced Geology Field School**

★3 (*fi 6*) (second term). The study and mapping of deformed sedimentary, igneous, and metamorphic rocks and of macroscopic and mesoscopic structures in the field. 12 days of field exercises following Winter term examination period. Co-prerequisites: EAS 233, 234, 331 and 332. [Faculty of Science]

**0 EAS 336 Sedimentary Systems**

★3 (*fi 6*) (either term, 3-0-3). Petrography, petrology, and petrogenesis of clastic, biochemical, and chemical sedimentary rocks. Diagenesis of sediments and sedimentary rocks, selected sedimentary depositional environments, and facies analysis, as tools for the interpretation of the sedimentary rock record. Fundamentals, terminology, and conceptual frameworks of sequence stratigraphy. Laboratory exercises based on the analysis of hand samples, thin sections, and core. Prerequisite: EAS 222. Not available to students with credit in EAS 235 or 236. [Faculty of Science]

**0 EAS 351 Environmental Applications of Geographical Information Systems**

★3 (*fi 6*) (either term, 3-0-3). This course emphasizes the applications of Geographic Information Systems (GIS) to the environmental sciences. Examples from resource management and the earth and biological sciences are discussed. Labs impart technical experience with ARCMINFO. Prerequisites: EAS 221 and one of MATH 113, 114, STAT 141, 151, or permission of the instructor. [Faculty of Science]

**EAS 354 Environmental Earth Science Field School**

★3 (*fi 6*) (either term). Introduction to fieldwork in geomorphology, biogeography and microclimatology. Elementary field mapping, the use of electronic field instrumentation for hydrological, water quality and micro-climatological monitoring, mapping and analysis of vegetation patterns, and techniques for the field description and laboratory analysis of soils and sediments. Introductory lectures and ten days of fieldwork. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisites: EAS 225, 250 and either 270 or 327, or consent of Instructor. [Faculty of Science]

**0 EAS 364 Petroleum Geology and Subsurface Methods**

★3 (*fi 6*) (either term, 3-0-3). Source rocks and origin of petroleum; principles of fluid migration; reservoir rocks and traps. Exploration and development of hydrocarbon plays using subsurface techniques. Introduction to reservoir evaluation, and hydrocarbon production. Prerequisite: EAS 222. Not available to students with credit in EAS 424 or 430. [Faculty of Science]

**0 EAS 368 Ore Deposits Geology**

★3 (*fi 6*) (either term, 3-0-3). Mineralogy and petrography of ore and gangue minerals under the reflected and transmitted light microscope and in hand specimen. Interpretation of ore textures and paragenetic sequences. Geological characteristics and distribution of ore deposits, including deposits of base and precious metals, diamonds, and industrial minerals. Prerequisite: EAS 331. Not available to students with credit in EAS 433. [Faculty of Science]

**0 EAS 370 Applied Atmospheric Physics**

★3 (*fi 6*) (either term, 3-0-0). An introduction to the physics of the atmosphere with applications: temperature, pressure, humidity, evaporation, condensation, dew, freezing, ice, frost, convection, clouds, rain, hail, rainbows, solar and terrestrial radiation. Development of thermodynamic concepts and tools used by atmospheric scientists in the analysis and forecasting of weather and climate: potential temperatures, psychrometry, thermodynamic diagrams, radiation charts. Prerequisites: EAS 270 and MATH 214. [Faculty of Science]

**0 EAS 371 Dynamics of the Atmosphere and Ocean I**

★3 (*fi 6*) (either term, 3-0-3). An introduction to fluid dynamics on the rotating earth with reference to the atmosphere and ocean; equations of motion and their simplification; vorticity; the atmospheric boundary layer; waves in the atmosphere and ocean. Prerequisites: EAS 270 and MATH 214. [Faculty of Science]

**0 EAS 372 Weather Analysis and Forecasting**

★3 (*fi 6*) (either term, 3-0-0). An introduction to synoptic analysis. Meteorological codes. Analysis of surface charts. Air-masses and fronts. Upper air constant pressure charts. Structure and evolution of weather systems. Analysis of current and predicted weather data. Synoptic weather forecasting. Prerequisite: EAS 371. [Faculty of Science]

**0 EAS 373 The Climate System**

★3 (fi 6) (either term, 3-0-0). An examination of the physical processes influencing global climate. Radiation and energy in the climate system, the hydrological cycle, general circulation of the atmosphere and ocean, climate feedback mechanisms, climate history and climate change, introduction to climate models. Prerequisite: EAS 270. Not available to students with credit in EAS 271. [Faculty of Science]

**EAS 374 Introduction to Numerical Modelling of the Atmosphere and Oceans**

★3 (fi 6) (either term, 3-0-3). The basics of programming are introduced. Numerical techniques (finite difference and spectral methods) are described with applications to simple problems relevant to the atmosphere and oceans such as advection and advection-diffusion, as well as simple energy balance models that describe global climate. [Faculty of Science]

**EAS 401 Industrial Internship Practicum**

★3 (fi 6) (either term, 3-0-0). Required of all students who have recently completed an EAS Industrial Internship Placement. This course must be completed during the first academic year following their return to full-time studies in order to graduate in the Industrial Internship Program. Grade is determined based on the employer evaluation of the student's job performance and the performance on written assignments and oral presentations during the course. Prerequisites: WKEXP 955 and 956. [Faculty of Science]

**EAS 402 The Practice of the Geological Profession**

★1 (fi 2) (either term, 1-0-0). The technical and professional duties and responsibilities of the professional geologist, the ethics of the geological profession, technical and professional organizations. The role of the geologist in the social environment. Restricted to final year students having completed ★90 in the Honors or Specialization Geology or Environmental Earth Sciences programs, or in a BSc (General) major in EAS. [Faculty of Science]

**0 EAS 421 Structural Geology and Tectonics**

★3 (fi 6) (either term, 3-0-3). Geometric, kinematic, and dynamic analysis of structures produced by deformation. Stress and the origin of faults, joints, veins, folds, and tectonites. Brittle and ductile strain in rocks. Extensional, strike-slip, and compressional structural associations. Regional structure, orogens, and crustal tectonics. Lab exercises include structural interpretation for subsurface hydrocarbon and mineral exploration, stereographic techniques for structural analysis, and the study of rock fabrics. Prerequisites: EAS 233 and any 300-level EAS course. Not available to students with credit in EAS 321. [Faculty of Science]

**0 EAS 425 Contaminant Hydrogeology**

★3 (fi 6) (either term, 3-0-3). An introduction to the principles of groundwater chemistry, the chemical evolution of natural groundwater flow systems, sources of contamination, and mass transport processes. Hydrogeologic aspects of waste disposal and groundwater remediation. Prerequisite: EAS 323. [Faculty of Science]

**EAS 426 Undergraduate Thesis**

★6 (fi 12) (variable, 3-0-0). Required for Honors students in their final year. Restricted to honors and specialization students in EAS. Prerequisite: Any 300-level EAS course. [Faculty of Science]

**EAS 427 Directed Study I**

★3 (fi 6) (variable, 3-0-0). EAS 427 and 428 provide a means whereby Specialization and Honors students in their fourth year of the EAS program may undertake a research project supervised by a faculty member. Prerequisite: Any 300-level EAS course. [Faculty of Science]

**EAS 428 Directed Study II**

★3 (fi 6) (either term, 3-0-0). Prerequisite: EAS 427. [Faculty of Science]

**EAS 429 Practical Study in Earth and Atmospheric Science**

★3 (fi 6) (variable, 10 - 15 days). Intensive field or practical study in EAS, typically as part of a team working off-campus. Details and areas of study may vary from year to year; consult the department about current offerings, fees and timing. Prerequisite: Any 300-level EAS course and permission of the department. [Faculty of Science] Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**0 EAS 432 Precambrian Geology**

★3 (fi 6) (either term, 3-0-0). Precambrian geological evolution of Earth focusing on development of the continental lithosphere. Geochemical evolution of the crust and mantle as well as the atmosphere and hydrosphere. Special reference to the evolution, stratigraphy, petrology and geochronology of the Canadian Shield. Prerequisite: EAS 320 and 331. [Faculty of Science]

**0 EAS 451 Digital Remote Sensing**

★3 (fi 6) (either term, 3-0-3). This course introduces the interactions of electromagnetic radiation with terrestrial materials (rocks, soils, water, snow). These notions are fundamental for the interpretation of optical, thermal, and radar remote sensing imagery. Labs focus on image processing with emphasis on radiometric and geometric enhancements and image classification. The course covers existing and upcoming sensors and applications of the data to earth sciences including

geologic and land use mapping and resource exploration. Prerequisite: EAS 221. [Faculty of Science]

**0 EAS 452 Topics in Earth Observation Science**

★3 (fi 6) (either term, 3-0-3). Specialized topics in Earth observation science of current interest to advanced undergraduates in Earth and Atmospheric Sciences. Topics may include image processing or specific applications of remote sensing and may vary from year to year. Consult the Department for details about current offerings. Prerequisite: EAS 451 or consent of instructor. [Faculty of Science]

**0 EAS 457 Global Change**

★3 (fi 6) (either term, 3-0-0). Major processes of change in the contemporary environment, their history and their interrelationships (climate and sea level change, changes in atmospheric composition, deforestation, desertification, water resource depletion, soil erosion, atmospheric and aquatic pollution); global biogeochemical cycles and their role in environmental change. Prerequisite: One of EAS 208, 225 or 250. [Faculty of Science]

**0 EAS 458 Cold Regions Geoscience**

★3 (fi 6) (either term, 3-0-0). Environments and environmental change associated with high latitude and high elevation regions. Topics vary: see www.eas.ualberta.ca/eas458 for details. May be taken more than once for credit provided no topic is repeated. Topics include: (1) Arctic environments; (2) Alpine environments; (3) Antarctica. Prerequisite: EAS 225 or 250 or consent of the instructor. [Faculty of Science]

**0 EAS 460 Geobiology**

★3 (fi 6) (either term, 3-0-3). The relationship between biology and geology. Ichnology, geomicrobiology, and microfossil content. The evolution of animal-rock relationships through time. Topics vary: see www.eas.ualberta.ca/eas460 for details. May be taken more than once for credit provided no topic is repeated. Topics include: (1) Ichnology; (2) Geomicrobiology; (3) Micropaleontology. Prerequisite: EAS 336. [Faculty of Science]

**0 EAS 462 Stratigraphy and Sedimentary Basins**

★3 (fi 6) (either term, 3-0-3). The science of rock strata in a sequence stratigraphic framework; sequence stratigraphic models; classification and evolution of sedimentary basins; applications of sequence stratigraphy to depositional systems and tectonic settings. Prerequisite EAS 336. Not available to students with credit in EAS 330. [Faculty of Science]

**0 EAS 464 Applied Hydrocarbon Geoscience**

★3 (fi 6) (either term, 3-0-3). Advanced topics in the characterization of petroleum resource and the regional occurrence of hydrocarbons. Topics vary: see www.eas.ualberta.ca/eas464 for details. May be taken more than once for credit provided no topic is repeated. Topics include: (1) Regional and Petroleum Hydrogeology; (2) Petroleum Systems. Prerequisite: EAS 323 and 364, or consent of the instructor. [Faculty of Science]

**0 EAS 465 Sedimentology**

★3 (fi 6) (either term, 3-0-0). The science of sedimentary rocks, focusing on the interpretation of sedimentary strata. Topics vary: see www.eas.ualberta.ca/eas465 for details. May be taken more than once for credit provided no topic is repeated. Topics include: (1) Carbonate Sedimentology and Diagenesis; (2) Clastic Sedimentology. Prerequisite: EAS 336. [Faculty of Science]

**0 EAS 466 Petrogenesis**

★3 (fi 6) (either term, 3-0-3). Origin and formation of igneous and metamorphic rocks in the light of field, mineralogical, chemical and experimental evidence. Topics vary: see www.eas.ualberta.ca/eas466 for details. May be taken more than once for credit provided no topic is repeated. Topics include: (1) Cratons, Kimberlites and Diamonds; (2) Petrology of Subduction Processes. Prerequisites: EAS 331 and EAS 332, which may be taken concurrently with permission of the instructor. [Faculty of Science]

**0 EAS 467 Planetary Geology**

★3 (fi 6) (either term, 3-0-3). The geologically evolving Earth and its context in an evolving solar system. Topics vary: see www.eas.ualberta.ca/eas467 for details. May be taken more than once for credit provided no topic is repeated. Topics include: (1) Planetary Systems; (2) Earth System Evolution (Not available to students with credit in EAS 435). Prerequisites: EAS 331 and EAS 332. [Faculty of Science]

**0 EAS 468 Geochemical Processes**

★3 (fi 6) (either term, 3-0-3). Application of geochemistry to Earth materials and geological settings. Topics vary: see www.eas.ualberta.ca/eas468 for details. May be taken more than once for credit provided no topic is repeated. Topics include: (1) Geochemistry of Ore Deposits; (2) Environmental Geochemistry (Not available to students with credit in EAS 420). Prerequisite: EAS 320 or consent of instructor. [Faculty of Science]

**0 EAS 470 Clouds and Storms**

★3 (fi 6) (either term, 3-0-3). Cloud properties; formation and growth of cloud droplets and ice crystals, rain and snow; weather radar; Doppler radar analysis; precipitation processes; severe convective storms, weather modification; numerical cloud models; Precipitation forecasting. Prerequisites: EAS 370 and 371. [Faculty of Science]

**0 EAS 471 Atmospheric Modelling**

★3 (fi 6) (either term, 3-0-3). Dynamics and physics of general circulation models. Numerical Weather Prediction models, ocean models, limited area models. Finite difference methods; spectral methods, and numerical stability. Prerequisites: EAS 371, 373 and MATH 215. [Faculty of Science]

**0 EAS 475 Dynamics of the Atmosphere and Ocean II**

★3 (fi 6) (either term, 3-2s-0). Synoptic-scale processes; the general circulation; turbulence; oceanic mixing; wind-driven circulation; waves in the atmosphere and ocean; baroclinic instability; tides. Prerequisites: EAS 212 and 371 or consent of instructor. [Faculty of Science]

**EAS 476 Introductory Microclimatology and Micrometeorology**

★3 (fi 6) (either term, 3-0-0). Physical processes governing microclimate, including radiative and convective transport. The surface energy balance and its daily cycle. The profiles of windspeed, temperature, humidity and carbon-dioxide concentration above bare and vegetated surfaces. Soil heat transfer. The vegetation canopy. Photosynthesis and transpiration. Penman-Monteith equation for evapotranspiration. Contrasting microclimate over deserts, lakes or oceans, snowpacks, and cropped or forested terrain. Prerequisites: Any 100-level Mathematics, Physics or Chemistry course, or EAS 100 or 102, and EAS 212 or 270 and EAS 275. [Faculty of Science]

**Graduate Courses****231.97.3 Faculty of Arts Courses****0 EAS 590 Topics in Human Geography**

★3 (fi 6) (either term, 3-0-0). Theory and practice of geographic research at the graduate level. Discussion of major themes and research methods in contemporary human geography. Techniques for the development and enhancement of professional skills. [Faculty of Arts]

**0 EAS 591 Advanced Resource Management and Environmental Policy**

★3 (fi 6) (either term, 3-0-0). Roles of governmental and nongovernmental organizations, industry and private enterprise, and advocacy organizations in addressing issues of resource scarcity and environmental policy. Institutions, policies, and strategies for resource and environmental management at the provincial/state, national, and international levels. Prerequisites: Any EAS 39X course or consent of Instructor. Research project. Classes concurrent with EAS 491. Not available to students with credit in EAS 491. [Faculty of Arts]

**0 EAS 592 Advanced Geographical Information Systems for Social Science**

★3 (fi 6) (either term, 2-0-1). Provides spatial analytic tools to social geographers and provides a social science perspective to geoprocessing students. Examples arise from marketing, operations research, sociology, and urban and economic geography. Assignments impart technical aspects through hands-on experience with commercial and in-house spatial analysis software. Prerequisite: EAS 221. Research project. Classes concurrent with EAS 492. Not available to students with credit in EAS 492. [Faculty of Arts]

**0 EAS 593 Advanced Human Dimensions of Global Change**

★3 (fi 6) (either term, 3-0-0). Investigation of issues related to the human use of resources and impact on the regional and global environment. Critical review of alternative frameworks for assessing, mitigating and adapting to global environmental change. Research project. Classes concurrent with EAS 493. Not available to students with credit in EAS 493. [Faculty of Arts]

**0 EAS 594 Advanced Environment and Health**

★3 (fi 6) (either term, 3-0-0). An examination of relations between human health and environmental issues, particularly those related to the natural, built, and social environments. Prerequisite: consent of Department. Research project. Classes concurrent with EAS 494. Not available to students with credit in EAS 494. [Faculty of Arts]

**EAS 599 Advanced Practical Study in Human Geography**

★3 (fi 6) (variable, 10 - 15 days). Intensive field or practical study in Human Geography, typically as part of a team working off-campus. Details and areas of study may vary from year to year; consult the department about current offerings, fees and timing. Topics vary; may be taken more than once for credit provided no topic is repeated. Classes concurrent with EAS 499. [Faculty of Arts] This course may require the payment of additional fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**231.97.4 Faculty of Science Courses****Notes**

- (1) The following undergraduate course may be taken for credit by graduate students: PALEO 418, 419.
- (2) Enrolment in graduate courses is subject to consent by the instructor. Some graduate courses are offered in alternate years as indicated below.

**EAS 520 Reading and Seminar Course**

★3 (fi 6) (either term, 0-3s-0). [Faculty of Science]

The most current Course Listing is available on Bear Tracks.

**0 EAS 521 Advanced Structural Geology and Tectonics**

★3 (fi 6) (either term, 3-0-3). Geometric, kinematic, and dynamic analysis of structures produced by deformation. Stress and the origin of faults, joints, veins, folds, and tectonites. Brittle and ductile strain in rocks. Extensional, strike-slip, and compressional structural associations. Regional structure, orogens, and crustal tectonics. Lab exercises include structural interpretation for subsurface hydrocarbon and mineral exploration, stereographic techniques for structural analysis, and the study of rock fabrics. Classes concurrent with EAS 421. Not available to students with credit in EAS 321 or 421. [Faculty of Science]

**0 EAS 523 Advanced Topics in Earth Observation Science**

★3 (fi 6) (either term, 3-0-3). Advanced treatment of methods and applications in earth observation science. Topics vary: see [www.eas.ualberta.ca/eas523](http://www.eas.ualberta.ca/eas523) for details. May be taken more than once for credit provided no topic is repeated. Topics include: (1) Multi- and hyperspectral remote sensing; (2) Radar remote sensing; (3) Geoinformatics; (4) Monitoring land use and land cover change with GIS. [Faculty of Science]

**0 EAS 524 Paleocology and Taphonomy**

★3 (fi 6) (either term, 3-0-0). Ideas and techniques that allow us to use the occurrences and manner of preservation of fossils in sediments to examine ancient environments these organisms lived in, and those that affected their remains after death. Offered in alternate years. [Faculty of Science]

**0 EAS 536 Mineralogy - Petrology - Geochemistry**

★3 (fi 6) (either term, 3-0-0). Studies in geochemistry, petrology and mineralogy. Topics vary: see [www.eas.ualberta.ca/eas536](http://www.eas.ualberta.ca/eas536) for details. May be taken more than once for credit provided no topic is repeated. Topics include: (1) Seminar; (2) Thermodynamics; (3) Mantle Studies. [Faculty of Science]

**0 EAS 539 Isotope Geology: Radioactive Systems**

★3 (fi 6) (either term, 3-0-0). Theory and systematics of radioactive decay, geochronology and isotopic tracing U-Pb, Rb-Sr, Sm-Nd, Re-Os and other radioisotope systems. Applications of natural radioactive isotope variation to a variety of problems spanning low and high temperature geologic processes. Offered in alternate years. [Faculty of Science]

**0 EAS 540 Isotope Geology: Stable Isotope**

★3 (fi 6) (either term, 3-0-0). Theory of light-element isotope fractionation; isotope variations in the meteoric cycle, igneous, metamorphic, sedimentary rocks and ore deposits. Isotope techniques in paleothermometry and paleoclimate studies. Isotope biogeochemistry, oil and gas. Offered in alternate years. [Faculty of Science]

**0 EAS 541 Topics in Structural Geology and Tectonics**

★3 (fi 6) (either term, 3-0-0). Current topics in structural geology and tectonics, from mesoscopic strain and vorticity indicators to orogenic belts; terrain analysis and comparative tectonics, with emphasis on the contribution of North American Phanerozoic orogens to current theory; lectures by instructor, and student research and seminar presentations. Offered in alternate years. [Faculty of Science]

**0 EAS 544 Hydrogeology**

★3 (fi 6) (either term, 3-0-3). The storage and movement of water through Earth media. Topics vary: see [www.eas.ualberta.ca/eas544](http://www.eas.ualberta.ca/eas544) for details. May be taken more than once for credit provided no topic is repeated. Topics include: (1) Quantitative Hydrogeology; (2) Regional Groundwater Flow. [Faculty of Science]

**0 EAS 546 Basin Modelling**

★3 (fi 6) (either term, 3-0-0). Basin forming mechanisms and basin types. Evaluation of burial and thermal history of sedimentary basins. Quantifying hydrocarbon generation. Numerical modelling of hydrocarbon generation, migration and entrapment in sedimentary basins. Exploration applications of basin modelling. Offered in alternate years. [Faculty of Science]

**0 EAS 547 Methods and Instrumentation in Geology**

★3 (fi 6) (either term, 3-0-0). Course will cover analytical techniques such as probe, SEM, XRD, TIMS/gas source mass spectrometry, superpress, XRF, ICP-MS, TEM, NMR, SHRIMP and microthermometric techniques. [Faculty of Science]

**0 EAS 553 Ice Dynamics and Glacier Hydrology**

★3 (fi 6) (either term, 3-0-0). Introduction to the mechanics and hydrology of ice masses with an emphasis on how they can be modelled and investigated in the field. The management of ice masses as sources of water and energy. [Faculty of Science]

**0 EAS 554 Circumpolar Quaternary Environments**

★3 (fi 6) (either term, 3-0-0). Nature of paleoenvironmental change in northern Canada prior to the instrumental record (~1950). Comparisons are also made with other Arctic regions as well as Antarctica. Topics include Tertiary cooling, glaciation, glacioisostasy, paleolimnology, paleoceanography, the ice core record, and linkages between high latitude and low latitude environments based on atmospheric and oceanographic forcing. Students from a wide range of disciplines are encouraged to participate. [Faculty of Science]

**0 EAS 556 Topics in Geomorphology and Sedimentology**

★3 (fi 6) (either term, 3-0-0). Selected, contemporary theories of landscape and sediment formation in glacial, glaciofluvial, alluvial, and periglacial environments. [Faculty of Science]



**O EAS 557 Environmental Change**

★3 (fi 6) (either term, 3-0-0). Processes and records of environmental change, with focus on the Cenozoic. Interpretation of paleoclimatic and paleoecological archives. Anthropogenic impacts in the context of long-term natural variability. [Faculty of Science]

**O EAS 560 Advanced Geobiology**

★3 (fi 6) (either term, 3-0-3). The relationship between biology and geology. Ichnology, geomicrobiology, and microfossil content. The evolution of animal-rock relationships through time. Topics vary: see [www.eas.ualberta.ca/eas560](http://www.eas.ualberta.ca/eas560) for details. May be taken more than once for credit provided no topic in EAS 460 or 560 is repeated. Topics include: (2) Ichnology; (2) Geomicrobiology; (3) Micropaleontology. Classes concurrent with EAS 460. [Faculty of Science]

**O EAS 562 Advanced Stratigraphy and Sedimentary Basins**

★3 (fi 6) (either term, 3-0-3). The science of rock strata in a sequence stratigraphic framework; sequence stratigraphic models; classification and evolution of sedimentary basins; applications of sequence stratigraphy to depositional systems and tectonic settings. Classes concurrent with EAS 462. Not available to students with credit in EAS 330 or 462. [Faculty of Science]

**O EAS 564 Advanced Applied Hydrocarbon Geoscience**

★3 (fi 6) (either term, 3-0-3). Advanced topics in the characterization of petroleum resources and the regional occurrence of hydrocarbons. Topics vary: see [www.eas.ualberta.ca/eas564](http://www.eas.ualberta.ca/eas564) for details. May be taken more than once for credit provided no topic in EAS 464 or 564 is repeated. Topics include: (1) Regional Petroleum Hydrogeology; (2) Petroleum Systems. Classes concurrent with EAS 464. [Faculty of Science]

**O EAS 565 Advanced Sedimentology**

★3 (fi 6) (either term, 3-0-0). The science of sedimentary rocks, focusing on the interpretation of sedimentary strata. Topics vary: see [www.eas.ualberta.ca/eas565](http://www.eas.ualberta.ca/eas565) for details. May be taken more than once for credit provided no topic in EAS 565 or EAS 465 is repeated. Topics include: (1) Carbonate Sedimentology and Diagenesis; (2) Clastic Sedimentology. Classes concurrent with EAS 465. [Faculty of Science]

**O EAS 566 Advanced Petrogenesis**

★3 (fi 6) (either term, 3-0-3). Origin and formation of igneous and metamorphic rocks in the light of field, mineralogical, chemical and experimental evidence. Topics vary: see [www.eas.ualberta.ca/eas566](http://www.eas.ualberta.ca/eas566) for details. May be taken more than once for credit provided no topic in EAS 466 or 566 is repeated. Topics include: (1) Cratons, Kimberlites and Diamonds; (2) Petrology of Subduction Processes. Classes concurrent with EAS 466. [Faculty of Science]

**O EAS 567 Advanced Planetary Geology**

★3 (fi 6) (either term, 3-0-3). The geologically evolving Earth and its context in an evolving solar system. Topics vary: see [www.eas.ualberta.ca/eas567](http://www.eas.ualberta.ca/eas567) for details. May be taken more than once for credit provided no topic in EAS 467 or EAS 567 is repeated. Topics include: (1) Planetary Systems; (2) Earth System Evolution (Not available to students with credit in EAS 435). Classes concurrent with EAS 467. [Faculty of Science]

**O EAS 568 Advanced Geochemical Processes**

★3 (fi 6) (either term, 3-0-3). Application of geochemistry to Earth materials and geological settings. Topics vary: see [www.eas.ualberta.ca/eas568](http://www.eas.ualberta.ca/eas568) for details. May be taken more than once for credit provided no topic in EAS 468 or 568 is repeated. Topics include: (1) Geochemistry of Ore Deposits (Not available to students with credit in EAS 434); (2) Environmental Geochemistry. Classes concurrent with EAS 468. [Faculty of Science]

**O EAS 570 Advanced Climatology**

★3 (fi 6) (either term, 3-0-0). A study of recent developments in climatology. Climate models and their use in examining past and future climates. Interactions between the atmosphere and terrestrial systems. Offered in alternate years. [Faculty of Science]

**O EAS 572 The Atmospheric Boundary Layer**

★3 (fi 6) (either term, 3-0-0). Dimensional analysis and similarity principles. Resolved (mean) and unresolved (fluctuating, turbulent) scales of motion, and the closure problem for the dynamical equations. Similarity theories for wind and turbulence over uniform terrain. Dynamics of disturbed windflows (hills, forests, clearings, etc.). Turbulent transport and dispersion models. Offered in alternate years. [Faculty of Science]

**O EAS 583 Advanced Contaminant Hydrogeology**

★3 (fi 6) (either term, 3-0-3). An introduction to principles of groundwater chemistry, the chemical evolution of natural groundwater flow systems, sources of contamination, and mass transport processes. Hydrogeologic aspects of waste disposal and groundwater remediation. Research project. Classes concurrent with EAS 425. Not available to students with credit in EAS 425. [Faculty of Science]

**O EAS 584 Advanced Clouds and Storms**

★3 (fi 6) (either term, 3-0-0). Cloud properties; formation and growth of cloud droplets and ice crystals, rain and snow; weather radar; Doppler radar analysis; precipitation processes; severe convective storms; weather modification; numerical cloud models; precipitation forecasting. Research project. Classes concurrent with EAS 470. Not available to students with credit in EAS 470. [Faculty of Science]

**O EAS 585 Advanced Digital Remote Sensing**

★3 (fi 6) (either term, 3-0-3). Introduces the interactions of electromagnetic radiation with terrestrial materials (rocks, soils, water, snow). These notions are fundamental for the interpretation of optical, thermal, and radar remote sensing imagery. Labs focus on image processing with emphasis on radiometric and geometric enhancements and image classification. Covers existing and upcoming sensors and applications of the data to earth sciences including geologic and land use mapping and resource exploration. Prerequisites: EAS 220 and 221. Classes concurrent with EAS 451. Not available to students with credit in EAS 451. [Faculty of Science]

**O EAS 587 Advanced Atmosphere-Ocean Dynamics**

★3 (fi 6) (either term, 3-2s-0). Synoptic-scale processes; the general circulation; turbulence; oceanic mixing; wind-driven circulation; waves in the atmosphere and ocean; baroclinic instability; tides. Class concurrent with EAS 475. Not available to students with credit in EAS 475. [Faculty of Science]

**EAS 600 Research Skills and Ethics**

★1 (fi 2) (either term, 0-1s-0). Ethics in research and the academic workplace. Topics may also include: essential skills for conducting research, presenting research in poster and oral form, publishing research, and preparation of research proposals. [Faculty of Science]

## 231.98 East Asian Studies, EASIA

Department of East Asian Studies  
Faculty of Arts

### Undergraduate Courses

**O EASIA 101 Understanding East Asia**

★3 (fi 6) (either term, 3-0-0). Important aspects of pre-modern and modern Asia from a broad interdisciplinary perspective.

**EASIA 223 East Asian Religions**

★3 (fi 6) (either term, 3-0-0). Survey of the major religious traditions of China, Japan, and Korea.

**O EASIA 230 Popular Culture and Contemporary Chinese Society**

★3 (fi 6) (either term, 3-0-0). Cultural texts and social changes in contemporary China. Note: Not open to students with credit in CHINA 230. Prerequisite: EASIA 101 or consent of Department.

**O EASIA 260 Popular Culture and Contemporary Japanese Society**

★3 (fi 6) (either term, 3-0-0). Cultural texts and social changes in contemporary Japan. Prerequisite: EASIA 101 or consent of Department.

**L EASIA 323 Topics in East Asian Religions**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★3 in East Asian Studies or RELIG 240 or consent of Department. May be repeated for credit when course content differs.

**EASIA 411 Topics in Comparative East Asian Literature**

★3 (fi 6) (either term, 3-0-0). Readings in translation.

**EASIA 480 Honors Seminar**

★3 (fi 6) (either term, 3-0-0). Note: Open to fourth year Honors students only.

**EASIA 490 Honors Thesis**

★3 (fi 6) (either term, 3-0-0). Note: Open to fourth year Honors students only.

### Graduate Courses

**EASIA 507 Topics in Major Contemporary Currents in Literary and Cultural Theory**

★3 (fi 6) (either term, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English. Note: This course is equivalent to C LIT 507 and MLCS 507.

**EASIA 598 Topics in East Asian Research**

★3 (fi 6) (either term, 0-3s-0). An inquiry into the diversity of disciplines used in the study of East Asian literatures and cultures.

**EASIA 599 Directed Reading in East Asian Studies**

★3 (fi 6) (either term, 0-3s-0). May be repeated for credit when course content differs.

## 231.99 Economics, ECON

Department of Economics  
Faculty of Arts

### Notes

- (1) See also INT D 257, 302, 303, 346, and 369 for courses which are offered by more than one Department or Faculty and which may be taken as options or as a course in this discipline.
- (2) In the course listings below, ECON 204 will be accepted as the equivalent prerequisite of ECON 101 and/or 102.

## Undergraduate Courses

### **O** ECON 101 Introduction to Microeconomics

★3 (fi 6) (either term, 3-0-0). How markets and governments determine which products are produced and how income is distributed in the Canadian economy. Not open to students with credit in ECON 204.

### **O** ECON 102 Introduction to Macroeconomics

★3 (fi 6) (either term, 3-0-0). Employment, inflation, international payments, monetary policy, and fiscal policy, all in the Canadian economy. Prerequisite: ECON 101 or consent of Department. Not open to students with credit in ECON 204.

### **ECON 204 Principles of Economics**

★3 (fi 6) (either term, 3-0-0). An introduction to economic principles as applied to business organization and finance; price determination; enterprise costs and output optimization; commercial and central banking; national income analysis. For students enrolled in the Faculty of Engineering only. Not open to students with credit in ECON 101 and/or 102.

### **O** ECON 211 Chinese Economic Development

★3 (fi 6) (either term, 3-0-0). A survey of the characteristics of and recent developments in the Chinese economy emphasizing the nature and consequences of China's economic reforms and Canada's economic relations with China. Prerequisite: ECON 101 or equivalent.

### **O** ECON 213 An Introduction to the Economics of Developing Countries

★3 (fi 6) (either term, 3-0-0). A survey of the major approaches to and problems of economic development in the less developed countries with particular emphasis on issues relating to savings and investment, income distribution, employment and population growth, and trade and aid. Prerequisite: ECON 101 and 102 or equivalent.

### **O** ECON 222 Technology, Institutions and Economic Growth

★3 (fi 6) (either term, 3-0-0). Differences in technology and institutions are used to explain why some countries are richer than others; why economic growth rates differ across time and jurisdictions; and causes of convergence/divergence in cross-country growth rates. Prerequisite: ECON 101 or equivalent.

### **O** ECON 281 Intermediate Microeconomic Theory I

★3 (fi 6) (either term, 3-0-0). The theory of consumer behavior; theory of production and cost; price and output determination under competition, monopoly and other market structures. Prerequisite: ECON 101 or equivalent.

### **O** ECON 282 Intermediate Macroeconomic Theory I

★3 (fi 6) (either term, 3-0-0). Models of price, interest rate, output, and employment determination; the impact of fiscal, monetary, and supply shocks; open economy macroeconomics with fixed and flexible exchange rates, and prices as well as international capital mobility. Prerequisite: ECON 101 and 102 or consent of Department.

### **ECON 299 Quantitative Methods in Economics**

★3 (fi 6) (either term, 3-0-1). Introduction to the use of statistical and mathematical methods in economics with computer applications. Prerequisites: ECON 101 and 102, STAT 141 or 151 and MATH 113 or SCI 100. Note: Designed for students taking Economics as a major subject of concentration. Department permission must be obtained by other students wishing to take this course. ECON 299 or equivalent must be taken before ECON 399.

### **ECON 303 Selected Topics in Economics I**

★3 (fi 6) (either term, 3-0-0). Content varies from year to year. Topics announced prior to registration period. Prerequisite: ECON 101. Additional prerequisites may be required; consult the department for further information.

### **L** ECON 323 International Economics

★3 (fi 6) (either term, 3-0-0). A survey of the principles of international economics and the applications to economic policy. Topics include international trade in goods and financial assets, trade policy and exchange rate determination. Note: Not open to students with credit in or enrolled in ECON 421 or 422. Prerequisite: ECON 101 and 102 or equivalent.

### **L** ECON 341 Money and Banking

★3 (fi 6) (either term, 3-0-0). Financial intermediation, commercial banking, central banking, securities markets, and regulation of the banking and financial sectors, the money supply process and monetary control. Prerequisite: ECON 101 and 102 or equivalent.

### **L** ECON 350 The Economics of Public Expenditures

★3 (fi 6) (either term, 3-0-0). Analysis of public sector expenditures in Canada. The rationale for government spending and the problems in the provision of public services. Prerequisite: ECON 281 or equivalent.

### **L** ECON 353 Taxation Policy and Structure

★3 (fi 6) (either term, 3-0-0). Analysis of the Canadian tax structure and its role in attaining certain goals of society; requirements for an optimal tax structure. Prerequisite or corequisite: ECON 281 or consent of Department.

### **L** ECON 355 Economics of Project Evaluation

★3 (fi 6) (either term, 3-0-0). The use of cost-benefit analysis and other economic

methods in evaluating public investment projects with examples from transportation, river basin management, electrical generation, oil and gas, and pollution control. Prerequisite: ECON 101 or 204 or equivalent.

### **L** ECON 357 Health Economics

★3 (fi 6) (either term, 3-0-0). Resource allocation and public policy in health care, including determinants of health status, market structures, incentives and the effects of imperfect information. Prerequisite: ECON 281 or equivalent, or consent of Department.

### **L** ECON 361 Transportation Economics

★3 (fi 6) (either term, 3-0-0). Travel demand and choice of means of transport; cost concepts including economies of network size and traffic density; efficient pricing of transport services and infrastructure; congestion and road pricing; advanced traveller information technologies; airline regulation, deregulation and competition. Prerequisite: ECON 281. Not open to students with credit in ECON 461.

### **L** ECON 365 Resource Economics

★3 (fi 6) (either term, 3-0-0). Issues in the production of exhaustible and renewable natural resources, including exploration, extraction, and taxation; scarcity and pricing; contemporary Canadian resource policy issues. Prerequisite: ECON 101 or equivalent.

### **L** ECON 366 Energy Economics

★3 (fi 6) (either term, 3-0-0). The economics of producing and consuming energy: pricing, role in economic growth; energy sources and markets; the role of government; regulation and other energy policy issues. Prerequisite: ECON 101 or equivalent.

### **L** ECON 369 Economics of the Environment

★3 (fi 6) (either term, 3-0-0). Economic growth and the deterioration of the environment; types and causes of environmental deterioration; theory, policy, and measurement relating to environmental deterioration; recreation economics; and current Canadian environmental topics. Prerequisite: ECON 101 or equivalent. Not open to students with credit in INT D 369. (Offered jointly by the Departments of Economics and Rural Economy.)

### **L** ECON 373 Industrial Organization

★3 (fi 6) (either term, 3-0-0). A survey of the behavior and performance of firms in different market structures and discussion of public policy toward the different structures. Note: Not open to students with credit in ECON 471 or 472. Prerequisite: ECON 281 or equivalent.

### **L** ECON 378 Law and Economics: Common Law and Economic Incentives

★3 (fi 6) (either term, 3-0-0). Economic implications of common law: property, contract, and tort; economic logic underlying different doctrines within the law, and illustrations of the law as an economic institution; externality, risk and deterrence, and other leading issues. Prerequisite: ECON 101 or equivalent.

### **L** ECON 379 Law and Economics: Criminal Law and Economic Incentives

★3 (fi 6) (either term, 3-0-0). Issues in criminal and family law. Economic analysis of crime deterrence and incentives for plea-bargaining. Rationale for child-support payment guidelines and economic incentives for private divorce agreements. Criminal provisions of the Competition Act and interface with intellectual property laws. Prerequisite: ECON 101 or equivalent.

### **ECON 384 Intermediate Microeconomic Theory II**

★3 (fi 6) (either term, 3-0-0). Designed for majors and Honors students in Economics. Extensions and applications of microeconomic theory: intertemporal choice, risk, uncertainty and expected utility; oligopoly and game theory; externalities, public goods, adverse selection, moral hazard, and asymmetric information; general equilibrium. Prerequisites: ECON 281 and MATH 113 or SCI 100 or equivalent.

### **ECON 385 Intermediate Macroeconomic Theory II**

★3 (fi 6) (either term, 3-0-0). Designed for majors and Honors students in Economics. Theories of stabilization policy; expectations; the government budget constraint; inflation and unemployment; business cycles and growth; theories of aggregate consumption, investment, money demand, and money supply. Prerequisites: ECON 281, 282 and MATH 113 or SCI 100.

### **ECON 386 Applications of Mathematics to Economics I**

★3 (fi 6) (first term, 3-0-0). Elements of logic and set theory, linear algebra, differential calculus and their conjunction, as used in classical and modern economic analysis. Prerequisites: ECON 281 and 282; MATH 113 or SCI 100, and MATH 120 or equivalent.

### **ECON 387 Applications of Mathematics to Economics II**

★3 (fi 6) (second term, 3-0-0). Difference and differential equations, linear inequalities, convexity, programming; assorted theorems of special use in modern economic analysis. Prerequisite: ECON 386.

### **ECON 399 Introductory Econometrics**

★3 (fi 6) (either term, 3-0-1). An elementary treatment of the major topics in econometrics with emphasis on applied regression methods. Prerequisites: ECON 281 and 282 and STAT 141 and ECON 299 or equivalent. Note: Not open to

students with credit in AREC 313 or ECON 408 or MGTSC 413 or 414 or 417 or 419 or STAT 341.

#### **ECON 400 Honors Essay: Fourth-Year Honors Economics**

★3 (fi 6) (either term, 3-0-0). Preparation of the honors essay, required for fourth-year honors students choosing the honors essay route. Prerequisite: consent of Department.

#### **ECON 403 Selected Topics in Economics II**

★3 (fi 6) (either term, 3-0-0). Content varies from year to year. Topics announced prior to registration period. Prerequisite: ECON 281. Additional prerequisites may be required.

#### **ECON 410 Pacific Rim Economic Development**

★3 (fi 6) (either term, 3-0-0). Analyzes the role of particular markets and institutions in selected Pacific Rim economies. Special emphasis is given to either China or Japan; students should consult the Department of Economics to find which country is being emphasized in a given year. Prerequisites: ECON 281 or equivalent.

#### **ECON 414 Economics of Developing Countries**

★3 (fi 6) (either term, 3-0-0). An introduction to models of growth and development; the role of agriculture, industry, finance, and trade in structural transformation of developing countries; approaches to development planning. Prerequisite: ECON 281 or consent of Department.

#### **ECON 418 Topics in Canadian Economic Development**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ECON 281 or consent of Department.

#### **ECON 421 International Trade**

★3 (fi 6) (either term, 3-0-0). Nature and relevance of international trade; early trade doctrines; the theory of comparative advantage, classical and modern approaches and empirical evidence for them; new approaches to the pure theory of international trade; economic growth and international trade; market imperfections and trade; commercial policy; economic integration and the gains from trade. Prerequisites: ECON 281 and MATH 113 or SCI 100 or consent of Department.

#### **ECON 422 International Payments**

★3 (fi 6) (either term, 3-0-0). Types of international transactions, macroeconomics in an open economy, exchange rates, balance of payments adjustments, and other issues in the international monetary system. Prerequisites: ECON 281, 282 and MATH 113 or SCI 100, or consent of Department.

#### **ECON 431 Labor Economics**

★3 (fi 6) (either term, 3-0-0). Topics include demand for labor, supply of labor, wage differentials, trade union behavior, the minimum wage, education and income distribution, discrimination, mandatory retirement, and non-market work. Prerequisites: ECON 281 and MATH 113 or SCI 100, or consent of Department.

#### **ECON 441 Monetary Theory and Policy**

★3 (fi 6) (either term, 3-0-0). Recent developments in monetary economics, including inflation tax and the optimum quantity of money; term structure of interest rates; money and economic activity; rules vs discretion in monetary policy; role of financial deregulation. Prerequisites: ECON 281, 282 and MATH 113 or SCI 100.

#### **ECON 442 The Economics of Financial Markets**

★3 (fi 6) (either term, 3-0-0). The measurement of risk; portfolio analysis; hedging and speculation; market microstructure; asset pricing and market equilibrium. Prerequisites: ECON 281, STAT 141 or equivalent, and MATH 113 or SCI 100 or equivalent.

#### **ECON 450 Topics in Public Expenditure and Fiscal Federalism**

★3 (fi 6) (either term, 3-0-0). Demand and supply of selected public services, public pensions, intergovernmental fiscal relations, and public choice. Prerequisites: ECON 281, and MATH 113 or SCI 100, or consent of Department. Not open to students with credit in ECON 455.

#### **ECON 453 Economics of Taxation**

★3 (fi 6) (either term, 3-0-0). Analysis of the effects of taxation on the economic decisions of households and firms as reflected in the allocation of resources in the economy and the distribution of the tax burden. Measurement of the efficiency and incidence of the tax system. Prerequisite: ECON 281, and MATH 113 or SCI 100, or consent of Department.

#### **ECON 462 Urban Economics**

★3 (fi 6) (either term, 3-0-0). Urban spatial structure, residential land use, firm location decisions, housing, transportation, and urban public finance. Prerequisites: ECON 281, and MATH 113 or SCI 100, or consent of Department.

#### **ECON 467 Environmental and Natural Resource Policy**

★3 (fi 6) (either term, 3-0-0). Environmental and natural resource law; domestic and global policy issues related to renewable and non-renewable resources. Prerequisites: MATH 113 or SCI 100, ECON 281, and one of ECON 365, ECON 366, ECON 369 or AREC 365. Not open to students with credit in ECON 466 or ENCS 473.

#### **ECON 471 Strategic Behavior of the Firm**

★3 (fi 6) (either term, 3-0-0). Oligopoly theory, cartel formation, product differentiation and advertising, entry into markets and strategic entry deterrence,

and research and development. Prerequisites: ECON 384, and MATH 113 or SCI 100, or consent of Department.

#### **ECON 472 Market Power: Theory and Policy**

★3 (fi 6) (either term, 3-0-0). Market definition and measurement of market power. Canadian competition policy, including merger, predation, abuse of dominance, price discrimination, tie-in sales, exclusive dealing, resale price maintenance, collusion and bid rigging. Prerequisites: ECON 281, and MATH 113 or SCI 100, or consent of Department.

#### **ECON 475 The Economics of Professional Sport**

★3 (fi 6) (either term, 3-0-0). An economic analysis of professional sport leagues, franchises and labor markets. Topics will include the economic structure of leagues, franchise value, profit maximization versus winning, pay and performance, free versus restricted agency, and discrimination. Prerequisite: ECON 281.

#### **ECON 481 Advanced Microeconomic Theory**

★3 (fi 6) (either term, 3-0-0). Consumer and producer theory, and selected topics. Prerequisites: ECON 384 and 386 or consent of Department.

#### **ECON 482 Advanced Macroeconomic Theory**

★3 (fi 6) (either term, 3-0-0). Business cycle theory, microfoundations of macro models, government budget constraints, expectations formation, the open economy, and representative agent optimizing models. Prerequisites: ECON 385 and 386.

#### **ECON 484 Game Theory and Economic Applications**

★3 (fi 6) (either term, 3-0-0). Analysis of structure and equilibrium of games. Applications to economic problems such as bargaining, auctions and collusion. Prerequisites: ECON 384 and 299.

#### **ECON 485 Macroeconomic Policy**

★3 (fi 6) (either term, 3-0-0). Analysis of the objectives, instruments and methods of macroeconomics policy using contemporary macroeconomics theory and examples from the policy experience of Canada and other nations. Prerequisites: ECON 385 or consent of Department.

#### **ECON 497 Econometric Methods**

★3 (fi 6) (either term, 3-0-0). Econometric problems and techniques with emphasis on regression methods and hypothesis testing. Single equation techniques and introduction to simultaneous equation systems. Matrix algebra is used extensively. Prerequisites: ECON 386, 387 and 399 or equivalent. Prerequisite or Corequisite: ECON 481 and 482 or consent of the Department. Not open to students with credit for ECON 408.

## Graduate Courses

#### **ECON 503 Microeconomic Theory I**

★3 (fi 6) (either term, 3-0-0). Producer and consumer behavior; partial equilibrium models of perfectly and imperfectly competitive markets; Walrasian general equilibrium; welfare economics. Prerequisites: ECON 386 and 387, 481 and 482.

#### **ECON 505 Microeconomic Theory II**

★3 (fi 6) (either term, 3-0-0). Choice under uncertainty; contingent claims and models of general equilibrium under uncertainty; markets with information asymmetries; non-cooperative game theory, games of incomplete information, repeated games, and bargaining theory. Prerequisite: ECON 503.

#### **ECON 509 Time Series Methods in Financial Econometrics**

★3 (fi 6) (either term, 3-0-0). Topics may include ARIMA modelling, spectral analysis, state-space models and the Kalman filter, nonstationary analysis, vector autoregressions, conditional heteroskedasticity and nonlinear models. Prerequisites: ECON 407 and 408 or equivalent.

#### **ECON 512 Economic Development I**

★3 (fi 6) (either term, 3-0-0). The techniques of development planning; qualitative and quantitative problems associated with the drafting and implementation of plans and programs; assessment of internal and external resources available for development and problems of measurement and mobilization of resources.

#### **ECON 513 Economic Development II**

★3 (fi 6) (either term, 3-0-0). Economic policy alternatives in a context of growth and development; problems of inflation, balance of payments, disequilibrium, concentration of growth effects; the role of international aid and other external measures.

#### **ECON 514 Topics in Canadian Economic Development**

★3 (fi 6) (either term, 3-0-0).

#### **ECON 521 International Economics I**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ECON 481 and 482, ECON 421 and 422 recommended.

#### **ECON 522 International Economics II**

★3 (fi 6) (either term, 3-0-0).

#### **ECON 531 Labor Economics I**

★3 (fi 6) (either term, 3-0-0). Factors influencing the supply of, and demand for, labor services and the process of relative wage determination in the long and short run. Determination of money wage levels, aggregate labor-force participation, and the level and structure of aggregate employment and unemployment.



**ECON 540 Monetary Economics I**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ECON 481 and 482.

**ECON 542 Economics of Financial Markets**

★3 (fi 6) (either term, 3-0-0). The course surveys Asset Pricing Theory with an emphasis on the utility-based discount-factor approach. The discount factor provides a unifying framework for the evaluation of most classes of assets including stocks, bonds, and derivatives. In particular, the course reviews mean-variance analysis, factor pricing, discrete time models, and classical results in continuous time, such as the Black and Scholes option Pricing Formula. These theoretical models are also illustrated by empirical applications.

**ECON 550 Public Expenditure**

★3 (fi 6) (either term, 3-0-0). The theory of the role of the public sector in a market economy; market failures, income redistribution, public choice, and fiscal federalism.

**ECON 553 Economics of Taxation**

★3 (fi 6) (either term, 3-0-0). Effects of taxes on allocation, distribution and stabilization objectives. Evaluation of major taxes with particular attention paid to efficiency and incidence considerations.

**ECON 557 Health Economics**

★3 (fi 6) (either term, 3-0-0). Theoretical and applied issues in the determination of health models and a survey of contemporary health economic policy issues.

**ECON 561 Transportation Economics**

★3 (fi 6) (either term, 3-0-0). Transportation demand and modal choice; economies of scale, traffic density, and scope; congestion pricing of highways and transport infrastructure; new traveller information technologies; airline competition, regulation and deregulation.

**ECON 566 Environmental Economics**

★3 (fi 6) (either term, 3-0-0). Economic theory and policy relating to environmental problems; welfare and public policy issues in environmental decision making. Environmental law; transboundary pollution; economic instruments for pollution control.

**ECON 567 The Economics of Exhaustible Resources**

★3 (fi 6) (either term, 3-0-0). Theoretical, empirical, and policy studies in the following areas: supply and pricing under various market structures, the demand for exhaustible resources, exploration, resource extraction under price and technological uncertainty, taxation of exhaustible resources, exhaustible resources and the macro economy. Not open to students with credit in ECON 565.

**ECON 570 Strategic Behavior of the Firm**

★3 (fi 6) (either term, 3-0-0). Game theory; oligopoly theory; dynamic price competition; cartel formation; product differentiation; and advertising; entry and strategic entry deterrence; research and development.

**ECON 571 Market Power: Theory and Policy**

★3 (fi 6) (either term, 3-0-0). Market definition and measurement of market power. Canadian competition policy, including merger, predation, abuse of dominance, price discrimination, vertical market restrictions, collusion and bid rigging. May also include a review of the theory of regulation and regulatory mechanisms.

**ECON 577 Economics of Gaming**

★3 (fi 6) (either term, 3-0-0).

**ECON 581 Macroeconomic Theory I**

★3 (fi 6) (either term, 3-0-0). An examination of the core topics in macroeconomic theory. These will generally include methods of modelling output, employment, prices, business cycles, and macroeconomic policy. Prerequisite or corequisite: ECON 481 and 482 or equivalent.

**ECON 582 Macroeconomic Theory II**

★3 (fi 6) (either term, 3-0-0). This course extends the analysis of ECON 581 and introduces students to more advanced issues. Prerequisite: ECON 581 or equivalent.

**ECON 591 Graduate Research Workshop I**

★3 (fi 6) (either term, 3-0-0). The course will aid students in identifying and developing a research topic, and develop skills in the writing and presentation of research. Students will be expected to present, write critiques of, and participate in discussions of published articles or working papers.

**ECON 592 Graduate Research Workshop II**

★3 (fi 6) (either term, 3-0-0). Completion of a research paper in one of the two fields chosen in the course work of year two. It is expected that students will use this paper to form the basis of their Candidacy Examination. Students are required to present their ongoing research to their peers and to members of the Department during this term. Students are required to attend the Department's internal workshop series. Students must make their research papers available to the Department one week prior to the scheduled presentation.

**ECON 598 Econometric Theory and Applications**

★3 (fi 6) (either term, 3-0-0). Advanced treatment of estimation, inference and econometric problems and techniques, including the use of matrix operations and statistical distribution theory, with an emphasis on applied econometric

analysis. Prerequisites: ECON 481 and 482 or equivalent, and an advanced undergraduate level course in econometrics. Note: Not open to students with credit in ECON 506.

**ECON 599 Applied Econometrics**

★3 (fi 6) (either term, 3-0-0). The role of economic theory in the process of specification and estimation of models. Interpretation and critical evaluation of applied work by means of selected topics in economics and econometrics. Prerequisite: ECON 598 or equivalent.

**ECON 608 Topics in Econometrics**

★3 (fi 6) (either term, 3-0-0).

**ECON 612 Topics in Economic Development**

★3 (fi 6) (either term, 3-0-0).

**ECON 614 Topics in European and North American Economic Development**

★3 (fi 6) (either term, 3-0-0).

**ECON 620 Topics in International Economics**

★3 (fi 6) (either term, 3-0-0).

**ECON 630 Topics in Labor Economics**

★3 (fi 6) (either term, 3-0-0).

**ECON 640 Topics in Monetary Economics**

★3 (fi 6) (either term, 3-0-0).

**ECON 652 Topics in Public Economics**

★3 (fi 6) (either term, 3-0-0). Topics available include local public finance, project evaluation, theory of public choice, public enterprise pricing policies, health care economics, and fiscal systems.

**ECON 664 Topics in Regional Economics**

★3 (fi 6) (either term, 3-0-0).

**ECON 672 Topics in Industrial Economics**

★3 (fi 6) (either term, 3-0-0).

**ECON 693 Topics in Comparative Economics**

★3 (fi 6) (either term, 3-0-0).

**ECON 699 Selected Research Topics in Economics**

★3 (fi 6) (either term, 3-0-0).

**ECON 900 Directed Research Project**

★3 (fi 6) (variable, unassigned).

**ECON 999 Directed Research Project**

★3 (fi 6) (Spring/Summer, 3-0-0). Prerequisites: ECON 503, ECON 581, ECON 598, ECON 599.

## 231.100 Economie, ECONE

Faculté Saint-Jean

### Cours de 1er cycle

**O ECONE 101 Introduction à la micro-économie**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Analyse du processus de détermination des produits et des quantités à produire en économie de marché. Étude de la répartition du revenu au Canada.

**O ECONE 102 Introduction à la macro-économie**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude de l'emploi, de l'inflation, des politiques monétaires et fiscales au Canada. Préalable(s): ECONE 101 ou l'approbation du Vice-doyen aux affaires académiques.

**O ECONE 281 Microéconomie intermédiaire I**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Présentation de la théorie néoclassique du consommateur, du producteur et de la détermination des prix et des quantités dans le cas de marchés concurrentiels, de monopole et de certaines autres structures de marché. Préalable(s): ECONE 101 ou l'approbation du Vice-doyen aux affaires académiques. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour ECON 383 ou MANEC 301.

**O ECONE 282 Macroéconomie intermédiaire I**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction aux modèles analytiques de la macroéconomie. Présentation des modèles à prix fixes et flexibles de la détermination du taux d'intérêt, de la production et de l'emploi. Étude des relations entre le marché de l'emploi et l'offre agrégée. Analyse des conséquences de la politique fiscale et monétaire ainsi que des chocs d'offre. Analyse en économie ouverte avec taux de change fixe et flexible. Étude des mouvements de capitaux. Préalable(s): ECONE 101 et 102 ou l'approbation du Vice-doyen aux affaires académiques. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MANEC 301 et 402.

**ECONE 299 Méthodes quantitatives en économie**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-1). Ce cours est destiné aux étudiants inscrits

à la majeure en économie. Introduction à l'utilisation des outils mathématiques en économie avec applications. Préalable(s): ECONE 101 et 102, STATQ 151 ou STAT 141 et MATHQ 113. Note: Ce cours doit être suivi avant ECONE 399.

### **ECONE 303 Thèmes d'économie I**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Le contenu peut varier d'année en année. Les sujets seront annoncés avant la période d'inscription. Préalable: ECONE101.

### **O ECONE 323 Economie internationale**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Aperçu des principes de l'économie internationale. Application de ces principes à la politique économique. L'accent est mis sur des sujets comme le commerce international, l'investissement étranger et la balance des paiements. Prérequis: ECONE 101/102 ou l'accord du Doyen.

### **O ECONE 365 Economie des ressources**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude des problèmes reliés à l'exploitation de ressources naturelles renouvelables et non-renouvelables, incluant l'exploration, l'extraction et la taxation; rareté et détermination des prix des ressources; politiques canadiennes actuelles touchant ces sujets. Préalable(s): ECONE 101 ou l'approbation du Vice-doyen aux affaires académiques.

### **O ECONE 369 Economie de l'environnement**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude des liens entre la croissance économique et la détérioration de l'environnement; type et cause de la détérioration de l'environnement; théorie, politique et mesures liées à la détérioration de l'environnement; sujets en économie de l'environnement spécifiques à l'économie canadienne. Préalable(s): ECONE 101 ou l'approbation du Vice-doyen aux affaires académiques.

### **O ECONE 384 Microéconomie intermédiaire II**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Ce cours est destiné aux étudiants inscrits à la majeure en économie. Développement élaboré de la théorie microéconomique et de certaines applications, avec un accent sur l'équilibre général. Certains des sujets suivants seront aussi abordés: choix intertemporels, choix risqués, l'incertain et l'hypothèse de l'utilité attendue; l'oligopole et la théorie des jeux, modèle walrasien et modèles avec entrée; économie du bien-être, biens publics, choix collectifs; problèmes d'information asymétrique (risque moral et antisélection). Préalable(s): ECONE 281 et 299 ou l'approbation du Vice-doyen aux affaires académiques.

### **O ECONE 385 Macroéconomie intermédiaire II**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Ce cours est destiné aux étudiants inscrits à la majeure en économie. Théories des politiques de stabilisation; anticipations; les contraintes budgétaires du gouvernement; inflation et chômage; cycles et croissance économiques; théories de la consommation agrégées, de l'investissement, de la demande de monnaie et de l'offre de monnaie. Préalables : ECONE 281, 282 et 299 ou l'approbation du vice-doyen aux affaires académiques.

### **O ECONE 399 Introduction à l'économétrie**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-1). Introduction aux méthodes statistiques utilisées dans l'analyse des problèmes économiques empiriques. Présentation et développement des principaux sujets de l'économétrie, avec un accent sur les techniques de régression linéaire. Préalables: ECONE 281, 282 et 299 ainsi que STATQ 151 ou l'équivalent.

## 231.101 Education, EDU

Faculty of Education

### Undergraduate Courses

#### **L EDU 250 The Profession of Teaching**

★3 (fi 6) (either term, 3-0-0). Explores the complex roles of teachers as professionals in contemporary schools. Students will become familiar with the scope and expectations of the role of the teacher and the framework within which teachers work. Credit cannot be obtained if credit has already been obtained in EDFX 200 or EDFXP 151.

### Graduate Courses

#### **EDU 503 Foundations of Curriculum**

★3 (fi 6) (first term, 3-0-0). Explores curriculum in public education from a variety of perspectives. Studies theoretical models to identify issues, concerns, challenges, and controversies that arise in educational curriculum and pedagogy. Prerequisite: Registration in the Master of Education in Educational Studies program. Sections may be offered in a Cost Recovery format at an increased rate of fee assessment; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **EDU 510 Fundamentals of Educational Research**

★3 (fi 6) (second term, 3-0-0). Explores the findings of educational research, and works to apply the results of research to educational problems. Focuses on conceptualizing methods of educational research to specific and individual educational sites and issues. Prerequisite: Registration in the Master of Education in Educational Studies program. Sections may be offered in a Cost Recovery format

at an increased rate of fee assessment; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **EDU 511 Introduction to School Improvement**

★3 (fi 6) (Spring/Summer, 3-0-0). Introduces the current state of knowledge, research, and theory in the field of education. Focuses upon teaching and learning within schools and other educational organizations in ways that synthesize educational experience with professional research knowledge. Studies educational change in that improves organizations. Prerequisite: Registration in the Master of Education in Educational Studies program. Sections may be offered in a Cost Recovery format at an increased rate of fee assessment; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **EDU 512 Leadership in Educational Settings**

★3 (fi 6) (Spring/Summer, 3-0-0). Examines the historical context of current thinking about educational leadership. Explores how leadership literature informs practice, while critically examining that literature from both theoretical and practical perspectives. Analyzes values and ethical principles in school leadership; complex dilemmas of educational leadership; and, works to develop a personal philosophy of educational leadership. Prerequisite: Registration in the Master of Education in Educational Studies program. Sections may be offered in a Cost Recovery format at an increased rate of fee assessment; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **EDU 513 Leadership for Educational Change**

★3 (fi 6) (Spring/Summer, 3-0-0). Introduces the relationship of research to educational leadership. Focuses upon synthesizing extant research literature and the need to address a specific leadership need within a school site using appropriate research methods. Studies how educational research can play a leadership role in the improvement of schools. Prerequisite: Registration in the Master of Education in Educational Studies program. Sections may be offered in a Cost Recovery format at an increased rate of fee assessment; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **EDU 514 Planning for Educational Change**

★3 (fi 6) (Spring/Summer, 3-0-0). Introduces how educational research can enhance educational change toward school improvement. Focuses on utilizing appropriate research methods to create a site-based research proposal for a specific school site. Focuses on planning educational research that improves schools. Prerequisite: Registration in the Master of Education in Educational Studies program. Sections may be offered in a Cost Recovery format at an increased rate of fee assessment; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **EDU 515 Conducting Educational Research**

★3 (fi 6) (either term, 3-0-0). Intended as a practical course to enable MES students to complete the research project proposed during the second summer residency for their Master's degree. Prerequisite: Registration in the Master of Education in Educational Studies program. Sections may be offered in a Cost Recovery format at an increased rate of fee assessment; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **EDU 520 Fluency with Information Technology**

★3 (fi 6) (either term, 3-0-3). The course will provide an overview of those aspects of information technology (IT) of special interest to educators. Prerequisite: Registration in Master of Education in Educational Studies. Corequisite: EDU 521. Sections may be offered in a Cost Recovery format at an increased rate of fee assessment; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **EDU 521 Information Technology in Education**

★3 (fi 6) (either term, 3-0-3). This is a project-based course that works with the content of EDU 520. Students develop short and long term goals for their use of educational IT and begin work towards the realization of those goals. Prerequisite: Registration in Master of Education in Educational Studies. Corequisite: EDU 520. Sections may be offered in a Cost Recovery format at an increased rate of fee assessment; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **EDU 526 Philosophical and Ethical Issues in Technology Integration**

★3 (fi 6) (either term, 3-0-3). Explores a range of philosophical and ethical issues that pertain to the use of technology in schools. Prerequisite: Registration in Master of Education in Educational Studies. Sections may be offered in a Cost Recovery format at an increased rate of fee assessment; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **EDU 575 Theory and Practice in Educational Technology**

★3 (fi 6) (either term, 3-0-0). This course is an overview of key topics and issues in educational technology as well as an introduction to basic skills in educational technology development. Course topics include ethics, philosophy, history, research and evaluation, fluency with information technology, multimodal literacies, simulations and visualization, sociological issues, social networking and

video/image production. The course is intended to expose students to a broad array of issues related to and influencing Educational Technology. Students may not receive credit for both EDPY 597 Theory and Practice in Educational Technology and EDU 575.

#### **EDU 593 Special Seminar in Educational Studies: Selected Topics**

★3 (*fi 6*) (either term, variable). Content varies from term to term. Topics announced prior to registration period. The student's transcript carries title descriptive of content. May be repeated. Prerequisite: Registration in Master of Education in Educational Studies Program. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **EDU 597 Special Seminar in Educational Studies: Selected Topics**

★3 (*fi 6*) (either term, variable). Content varies from term to term. Topics announced prior to registration period. The student's transcript carries title descriptive of content. May be repeated. Prerequisite: Registration in Master of Education in Educational Studies Program. Sections may be offered in a Cost Recovery format at an increased rate of fee assessment refer to the Fees; Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **EDU 900 Directed Research Project**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: Registration in the Master of Education in Educational Studies program. Sections may be offered in a Cost Recovery format at an increased rate of fee assessment; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

## 231.102 Education - Adult, EDAE

Department of Educational Policy Studies  
Faculty of Education

### Undergraduate Courses

#### **EDAE 404 Developmental Course**

★3 (*fi 6*) (either term, 3-0-0). Content varies as new courses are developed. Topics announced prior to registration. The student's transcript carries title descriptive of content. May be repeated. Prerequisite: consent of Department.

#### **EDAE 445 Trends in Adult Education**

★3 (*fi 6*) (either term, 3-0-0). Examines the social and historical trends of adult education. Laying a foundation for future adult education courses, focuses on events and issues that emerged in the formative years of the field. These will be developed further as they relate to adult education as a growing field of study in the present and in the future.

#### **EDAE 460 Facilitating Adult Learning**

★3 (*fi 6*) (either term, 3-0-0). Selected aspects of facilitating adult learning in different settings are explored. Examination of how learning theory influences instruction. Facilitation methods are considered in relation to intended learning outcomes as well as learner and educator characteristics (e.g. Philosophical orientation, values, personality type, teaching style, learning style). Methods that foster group cohesiveness and higher-order thinking skills are emphasized. Participants develop a personal theory of practice in relation to facilitating adult learning. Prerequisite: EDAE 345 or 445. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **EDAE 461 Developing Programs for Adults**

★3 (*fi 6*) (either term, 3-0-0). This course will examine theoretical and conceptual principles of developing programs for adult learners. Emphasis will be on the application of these principles both credit and non-credit programs offered in a variety of settings. Prerequisite: EDAE 390. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **EDAE 475 Project in Adult and Postsecondary Education**

★3 (*fi 6*) (either term, 3-0-0). This is a project-based course undertaken in a postsecondary or community setting. Students may not receive credit for both EDPY 475 and EDAE 475. May contain alternative delivery sections; see \$200.

#### **EDAE 485 Evaluating Adult Learning**

★3 (*fi 6*) (either term, 3-0-0). This course focuses on two types of evaluating adult learning: achievement testing and classroom assessment. Theory and practice of evaluating learning in the cognitive, psychomotor and affective domains are framed around issues associated with learning in formal and non-formal environments. Pre-/corequisite: EDAE 390 or consent of Department. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **EDAE 496 Individual Directed Study**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: consent of Department.

#### **EDAE 498 Individual Directed Laboratory Study**

★3 (*fi 6*) (either term, 0-6L-0). Prerequisite: consent of Department.

The most current Course Listing is available on Bear Tracks.

## 231.103 Education - Business, EDBU

Department of Secondary Education  
Faculty of Education

**Note:** the course prefix for Education (Business) has changed from EDBUS to EDBU.

### Undergraduate Courses

#### **EDBU 341 Teaching of Keyboarding/Typewriting**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: Keyboarding and Word Processing.

#### **EDBU 357 Teaching of Accounting in Automated Data Processing and Accounting**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ACCTG 300 or 311.

## 231.104 Education - Career Technology Studies, EDCT

Department of Secondary Education  
Faculty of Education

**Note:** the course prefix for Education (Career Technology) has changed from EDCTS to EDCT.

### Undergraduate Courses

#### **EDCT 400 Conference Seminar**

★1-12 (*variable*) (either term, variable). Content varies. Topics are announced prior to registration. The transcript will carry a title descriptive of content. Prerequisite: consent of Department.

### Graduate Courses

#### **EDCT 500 Conference Seminar**

★1-3 (*variable*) (either term, variable). Content varies. Topics are announced prior to registration. The transcript will carry a title descriptive of content. Prerequisite: consent of Department.

## 231.105 Education - Elementary, EDEL

Department of Elementary Education  
Faculty of Education

### Undergraduate Courses

#### **EDEL 300 Introduction to Teaching in the Elementary School**

★3 (*fi 6*) (either term, 3-0-0). This course is an overview of the roles of the teacher in elementary school. Emphasis is placed upon strategies for planning, instruction and assessment within a positive classroom environment. Corequisite: Courses in the Introductory Professional Term for the Elementary Education Route. Successful completion is required prior to being granted permission to continue into the second week of EDFX 325.

#### **EDEL 302 Curriculum and Instruction in Elementary School Art**

★3 (*fi 6*) (either term, 3-0-0). Formerly ED EL 200. This course provides an introduction to visual arts education for elementary schools. It is comprised of lectures, discussions, audio visual presentations, and hands-on media experiences. No visual arts background necessary. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisite: Introductory Professional Term.

#### **EDEL 305 Language Arts in the Elementary School**

★3 (*fi 6*) (either term, 3-0-0). This course will introduce the language arts curriculum and will give a broad overview of the knowledge and skills required to implement a language arts program in the elementary school, including oral language, reading and writing. Corequisite: Courses in the Introductory Professional Term for the Elementary Education Route. Successful completion of the on-campus portion of the IPT is required prior to being granted permission to continue into EDFX 325.

#### **EDEL 316 Communication Through Mathematics Education**

★3 (*fi 6*) (either term, 3-0-0). This course provides an introduction to the teaching and learning of mathematics in the elementary classroom. The focus will be on using curriculum, strategies, planning and resources to meet student needs. Prerequisite: Introductory Professional Term.

#### **EDEL 321 Introduction to Curriculum and Instruction in Elementary School Physical Education**

★3 (*fi 6*) (either term, 3-0-0). This course is designed to prepare students to teach Physical Education effectively in an elementary school setting. The goals to



this end integrate understanding of child development, physical education, health, curriculum and instruction and making curricula links. Corequisite: Courses in the Introductory Professional Term for the Elementary Education Route (for sections of EDEL 321 offered in the IPT). Successful completion is required prior to being granted permission to continue into the second week of EDFX 325. Note: This course is offered in the Introductory Professional Term and in ED CORE II. Students in the Physical Education Minor should enroll in EDEL 321 during the IPT.

#### **EDEL 325 Curriculum and Instruction in Elementary School Music**

★3 (fi 6) (either term, 3-0-0). An introduction to the theory and practice of teaching music in the elementary classroom. Special emphasis on hands-on experience with techniques, strategies, and materials appropriate for K-6. No previous experience with music notation necessary. Prerequisite: Introductory Professional Term.

#### **EDEL 328 Music Literacy: The Child**

★3 (fi 6) (either term, 3-0-0). An introduction to the theory and practice of teaching music literacy in the elementary classroom. Special emphasis on hands-on experience with techniques, strategies, and materials appropriate for K-6 including those employed in the Kodály approach. Previous experience with music notation recommended. Prerequisite: Introductory Professional Term. Note: priority given to students in the Music Education Minor.

#### **EDEL 330 Curriculum and Instruction in Elementary School Science**

★3 (fi 6) (either term, 3-0-0). This course provides an introduction to teaching elementary children about science and 'design and make' technology. Such themes as children's learning, science/technology/society connections, the Alberta program, planning and instruction and assessing children's progress will be explored. Students may not receive credit for both EDEL 330 and EDEL 372. Corequisite: Courses in the Introductory Professional Term for the Elementary Education Route (for sections of EDEL 330 offered in the IPT). Successful completion is required prior to being granted permission to continue into the second week of EDFX 325. Note: This course is offered in the Introductory Professional Term and in ED CORE II. Students in the Math/Science Minor should enroll in EDEL 330 during the IPT.

#### **EDEL 335 Curriculum and Instruction in Elementary School Social Studies**

★3 (fi 6) (either term, 3-0-0). An introduction to planning, resources, curriculum and strategies for meeting students needs through social studies. Prerequisite: Introductory Professional Term.

#### **EDEL 345 Introduction to Curriculum and Instruction in Elementary School Health Education**

★3 (fi 6) (either term, 3-0-0). Designed to prepare students to teach Health Education effectively in the elementary school setting. The focus will be on curriculum, strategies, planning, and resources to meet student needs.

#### **EDEL 355 Program Environments in Early Childhood Education**

★3 (fi 6) (either term, 0-3L-0). An introduction to Early Childhood Education with an emphasis on the learning environment and the roles of the teacher within that environment. Observations and interactions in early childhood classrooms constitute the lab component of this course. Restricted to students in the Early Childhood Education minor. Prerequisite: Education Core I.

#### **EDEL 394 Selected Topics in Elementary Education I**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

#### **EDEL 395 Group Project I Elementary Education**

★1-12 (variable) (either term, variable). Prerequisite: consent of Department.

#### **EDEL 400 Design of Elementary Art Curriculum**

★3 (fi 6) (either term, 1-0-2). Application of current art education research, curriculum, and technology to program planning in art and art across the curriculum. Prerequisite: An introductory curriculum and instruction course in Art Education, or consent of Department.

#### **EDEL 404 Developing Literacy: Pre-School to Grade Three**

★3 (fi 6) (either term, 3-0-0). This senior education course focuses on the teaching and learning of literacy in Early Childhood settings (pre-school to grade three). The course explores instructional strategies, materials and classroom organization, based on contemporary theory and research. Prerequisite: EDEL 305 or equivalent introductory course in language arts education.

#### **EDEL 406 Diagnostic Teaching of Reading and Writing**

★3 (fi 6) (either term, 3-0-0). This course focuses on assessment techniques for reading and writing, provides information on administering these techniques to elementary school children and develops an understanding of how to interpret the information collected. Planning and implementing reading and writing instruction and selecting materials from a diagnostic perspective are also included in the course. Prerequisite: An introductory curriculum and instruction course in language learning; or consent of Department.

#### **EDEL 407 Reading in the Elementary School**

★3 (fi 6) (either term, 3-0-0). This course addresses the nature of the reading process. The development of children's reading abilities, organizing an environment for instruction in reading, teaching, reading strategies, the reading-writing connections, reading across curriculum, and the assessment of reading. Prerequisite:

An introductory curriculum and instruction course in language learning; or consent of Department.

#### **EDEL 408 Writing in the Elementary School**

★3 (fi 6) (either term, 3-0-0). Topics include the development of children's writing abilities, the nature of the writing process, organizing an environment for instruction in writing, teaching strategies, the reading-writing connection, writing across the curriculum, and the assessment of writing. Prerequisite: An introductory curriculum and instruction course in language learning; or consent of Department.

#### **EDEL 409 Teaching Literature in Elementary Schools**

★3 (fi 6) (either term, 3-0-0). Topics include an exploration of the various genres of children's literature, authors and illustrators, strategies for planning and implementing a literature-based program across the elementary curriculum, response activities, and resources for teaching. Prerequisite: An introductory curriculum and instruction course in language learning; or consent of Department.

#### **EDEL 411 Literacy Development through Drama and Literature**

★3 (fi 6) (either term, 3-0-0). This course elucidates the role of drama as a teaching/learning medium in an elementary school program studies. Students sample and question current writing in the field and actively participate in various drama modes. Prerequisite: An introductory curriculum and instruction course in language learning; or consent of Department.

#### **EDEL 412 Teaching Language Arts in First Nations, Inuit and Métis Contexts**

★3 (fi 6) (either term, 3-0-0). This course is designed to help prepare teachers to develop learners' oral and written language skills in elementary classrooms, particularly for First Nations, Inuit, and Métis (FNIM) students. It offers an overview, within the Canadian context, of the linguistic, psycholinguistic, and sociolinguistic backgrounds, strengths and needs of FNIM children in elementary classrooms. Topics include language acquisition, bilingualism, bidialectalism, linguistic diversity, language maintenance and loss, teaching Standard English as a second language or dialect, and materials evaluation and development. Prerequisite: EDEL 305 or consent of the Department.

#### **EDEL 415 Issues in Elementary Mathematics Education**

★3 (fi 6) (either term, 3-0-0). Focus is on current issues in mathematics education related to teacher and student roles, mathematical tasks and tools, and the learning environment. Prerequisite: An introductory curriculum and instruction course in mathematics education; or consent of Department.

#### **EDEL 416 Assessing Children's Understanding of Mathematics**

★3 (fi 6) (either term, 3-0-0). This course will focus on how children learn mathematics along with related assessment practices such as performance based assessment, writing, portfolios, observation and questioning. Prerequisite: An introductory curriculum and instruction course in mathematics education; or consent of Department.

#### **EDEL 420 Curriculum and Instruction in Elementary School Physical Education**

★3 (fi 6) (either term, 3-0-0). Prerequisites: An introductory curriculum and instruction course in elementary school physical education; or consent of Department.

#### **EDEL 425 The Child's Voice: Techniques for the Children's Choir**

★3 (fi 6) (either term, 3-0-0). This course focuses on the development of healthy and artistic singing in the children's choir. Students will analyze and conduct choral literature and observe choral rehearsals. Prerequisite: MUSIC 230; or consent of Department. Note: Priority given to students in the Music Education Minor.

#### **EDEL 427 Music Creativity: Teaching and Learning**

★3 (fi 6) (either term, 3-0-0). An introduction to the philosophy and pedagogical principles of Carl Orff's Schulwerk. The course focuses on Orff orchestration skills and the application of the Orff Approach in curricular planning. Pre/corequisite: MUSIC 207 or consent of Department. Note: Priority given to students in the Music Education Minor.

#### **EDEL 428 Music in the Elementary School**

★3 (fi 6) (either term, 3-0-2). This course focuses on curricular planning and selection of resources for the elementary music program. Methodologies are applied in field-based experiences with elementary school children. Lab hours require scheduled visits to elementary classrooms. Prerequisite: MUSIC 101; EDEL 328 and 427; or consent of Department. Note: Priority given to students in the Music Education Minor.

#### **EDEL 432 Pedagogical Content Knowledge for Elementary Science I**

★3 (fi 6) (either term, 3-0-0). An exploration of energy and how humans change energy to meet a need. Emphasis is on children's conceptions and designing appropriate teaching strategies. Specific topics include electricity and magnetism; hearing and sound; wheels and levers; mechanisms using electricity; and building devices and vehicles that move. Prerequisite: EDEL 330.

#### **EDEL 433 Pedagogical Content Knowledge for Elementary Science II**

★3 (fi 6) (either term, 3-0-0). This course consists of children's conceptions of the earth and sky and ways teachers can design teaching strategies to assist children in restructuring these conceptions. Specific topics include air and aerodynamics; sky science; weather watch; and rocks and minerals. Prerequisite: EDEL 330.

**EDEL 435 Instruction in Elementary School Social Studies**

★3 (fi 6) (either term, 3-0-0). An investigation of the underlying principles and practical applications of curriculum and instruction in social studies. Prerequisite: An introductory curriculum and instruction course in elementary Social Studies; or EDEL 335; or consent of Department.

**EDEL 445 Teaching Second Languages in the Elementary School**

★3 (fi 6) (either term, 3-0-0). An introduction to theory and practice of teaching second languages in the elementary classroom. Focus is on curricular planning, teaching methods and techniques, materials and resources, and assessment. Will include a field placement in an off-campus second language, immersion, or bilingual classroom for one half day per week. Prerequisite: The Introductory Professional Term and a working knowledge of the language to be taught or consent of Department. Note: Priority given to students in the Second Languages Minor.

**EDEL 451 Methods and Programs in the Teaching of English as a Second Language**

★3 (fi 6) (either term, 3-0-0). This course is designed for those interested in ESL teaching at the K-6 levels. Course focuses include orientation and assessment of ESL students, program planning, ESL teaching methods and techniques, integrating language and content, and ESL materials and resources. This course will include a field placement in an off-campus ESL classroom one morning per week. Prerequisite: EDPY 416; or consent of Department. Note: Priority given to students in Teaching English as a Second Language Minor.

**EDEL 455 Play as a Teaching Strategy**

★3 (fi 6) (either term, 3-0-0). This course examines how choice and self direction can enhance children's learning and thinking in the elementary school. Students will be involved in planning, implementing, and evaluating integrated curriculum projects in the elementary classroom.

**EDEL 457 Theory and Practice in Early Childhood Education**

★3 (fi 6) (either term, 3-0-3). Gives students an indepth understanding of some of the major contemporary theories and approaches to Early Childhood Education, and examines how they can be utilized with young children from diverse backgrounds to enhance their learning. Students will be involved in planning, implementing and documenting integrated curriculum projects in a variety of early childhood settings. Prerequisite: EDEL 355 and Introductory Professional Term; or consent of Department.

**EDEL 458 Practical Experience with Curriculum Models in Early Childhood Education**

★3 (fi 6) (either term, 0-0-3). This lab-based course will provide opportunities to gain practical experiences in a variety of early childhood education settings. These include observations, analysis and discussion in relation to the examination of contemporary Early Childhood Education theories in EDEL 457. Many of the field experience sites require all volunteers to have a criminal record check and a child welfare check. Prior to beginning this course it is recommended that all students have these checks completed. Prerequisites: EDEL 355 and Introductory Professional Term; or consent of Department. Students must be registered concurrently in EDEL 457. Students cannot receive credit for both EDEL 458 and 456.

**EDEL 490 Supervised Independent Study in Elementary Education II**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**EDEL 495 Seminar in Group Projects in Elementary Education II**

★1-12 (variable) (either term, variable). Prerequisite: consent of Department.

**EDEL 496 Group Projects in Elementary Education II**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

**Graduate Courses****EDEL 505 Theory and Practice in Language Arts**

★3 (fi 6) (either term, 3-0-0). Examines a variety of theoretical perspectives on language and literacy and explores their implications for work with children. Questions of language acquisition, the role of language in learning, the development of literacy, and sociocultural influences are explored. Prerequisite: Equivalent to ★3 in language arts education, or consent of Department.

**EDEL 508 Diagnosis and Remediation of Reading and Writing Problems I**

★3 (fi 6) (either term, 3-0-3). Focuses on the acquisition of skills in diagnostic assessment and remediation of reading and writing difficulties in children and adults. The influences of various theoretical perspectives and social issues on diagnosis and remediation are also explored. Students must enroll in EDEL 508 and 509 in the same year. Pre- or corequisite: EDEL 505 or consent of Department.

**EDEL 509 Diagnosis and Remediation of Reading and Writing Problems II**

★3 (fi 6) (either term, 3-0-3). Provides advanced study in the diagnosis and remediation of reading and writing difficulties. Students will develop expertise with a variety of assessment and intervention strategies while extending their understanding of how various theories and social issues affect the nature and extent of the support provided to people with reading and writing difficulties. Students must enroll in EDEL 508 and 509 in the same year. Prerequisite: EDEL 508 or consent of Department.

**EDEL 510 Children's Literature in the Elementary School**

★3 (fi 6) (either term, 3-0-0). Focuses on approaches to teaching across the

curriculum that will allow students to explore the value of literature in the lives of children; the development of a literature program; the creation of environments that enable children to respond to and grow through literature; the relationships between literature and literacy; and current research in literature in education. Prerequisite: Equivalent to ★3 in language arts education, or consent of Department.

**EDEL 511 Leadership in Language Arts**

★3 (fi 6) (either term, 3-0-0). Explores the development and implementation of elementary language arts programs in schools. The roles played by teachers, consultants and administrators in developing, implementing, refining and monitoring language arts programs are analyzed in relation to concepts of leadership in language arts. Prerequisite: EDEL 505 or consent of Department.

**EDEL 514 Early Literacy Development**

★3 (fi 6) (either term, 3-0-0). This course explores contemporary issues and concerns pertaining to the literacy development of young children. Aspects of theory, research, policy and practice are examined. Students will acquire a depth and breadth of understanding of how young children (up to eight years) become successful readers and writers.

**EDEL 515 Developing Writing Abilities**

★3 (fi 6) (either term, 3-0-0). This course explores current issues in writing theory and pedagogy. The focus is on the development of writing abilities of elementary and middle years students, in a variety of forms and media, in school and home/community contexts. Prerequisite: EDEL 505 or consent of Department.

**EDEL 516 Contemporary Issues in Elementary Mathematics Education**

★3 (fi 6) (either term, 3-0-0). This course explores contemporary issues related to the teaching and learning of mathematics in elementary schools. Aspects of theory, research, policy and practice are examined. Prerequisite: Equivalent to 3 credits in mathematics education or consent of Department.

**EDEL 517 Classroom-Based Research in Elementary Mathematics Education**

★3 (fi 6) (either term, 3-0-0). Current issues in teaching and learning mathematics will be examined through classroom-based research and practice. Classroom events, mathematical tasks, and student work will be used as sites for critique, inquiry and investigation into theory and practice of teaching mathematics to children.

**EDEL 519 Assessment of the Language Arts**

★3 (fi 6) (either term, 3-0-0). Aspects of theory, research, policy, and practice within the assessment of student performance in the language arts will be examined. The course explores contemporary issues and concerns in the conduct and interpretation of classroom-based language arts with a view to facilitating informed professional and instructional decisions. Prerequisite: EDEL 505 or consent of Department.

**EDEL 525 Trends and Issues in Classroom Practice**

★3 (fi 6) (either term, 3-0-0). Focuses on elements of teaching and learning in relation to actual needs, problems, issues of elementary school, classroom practice as identified by participants.

**EDEL 533 Theory and Methodology in Second Language Teaching**

★3 (fi 6) (either term, 3-0-0). The course examines second language acquisition theory and research in the context of classroom applications. It also critically evaluates a wide range of language teaching methods and strategies.

**EDEL 535 Socio-cultural Aspects of Second Language Learning and Teaching**

★3 (fi 6) (either term, 3-0-0). The course examines research on social and cultural aspects of second language acquisition and explores the relevance of this research for second-language teaching practice.

**EDEL 537 Second Language Curriculum Design, Material Development and Assessment**

★3 (fi 6) (either term, 3-0-0). The course examines theories that apply to conceptualizing and analyzing second language curriculum and explores how theories inform the work of designing teaching plans, selecting and developing teaching materials, and assessing teaching and student learning.

**EDEL 555 Early Childhood Education: Home/School/Community Relations**

★3 (fi 6) (either term, 3-0-0). This course is designed to investigate the teacher's role in improving communication among the school, home, and community.

**EDEL 556 Program Development in Early Childhood**

★3 (fi 6) (either term, 3-0-0). Prerequisite: EDEL 457 or consent of Department.

**EDEL 557 Research in Program Development in Early Childhood Education**

★3 (fi 6) (either term, 3-0-0). Prerequisite: EDEL 556 or consent of Department.

**EDEL 559 Principles of Curriculum Planning and Pedagogy in Early Childhood Settings**

★3 (fi 6) (either term, 3-0-3). A course in planning and implementing integrated curricula for children from preschool to grade three building upon principles of child development and learning. Students may not receive credit for both EDEL 558 and EDEL 559.

**EDEL 561 Processes of Curriculum Development**

★3 (*fi 6*) (either term, 3-0-0). A study of the ways in which curricula are produced, implemented, and evaluated.

**EDEL 565 Research and Support Services and Skills**

★3 (*fi 6*) (either term, 0-3s-0). Reports and discussion by staff and graduate students to provide candidates for advanced degrees with experience in the selection and evaluation of research problems and procedures.

**EDEL 567 Introduction to Educational Research**

★3 (*fi 6*) (either term, 0-3s-0). This introductory research methodology course is intended to support graduate students' understanding of the many ways in which educational research is conceptualized and conducted. Students will develop their ability to read educational research critically and with understanding in order to support their work as researchers and practicing professionals. Prerequisite: consent of Department.

**EDEL 570 Instructional Practices in the Elementary Classroom**

★3 (*fi 6*) (either term, 3-0-0).

**EDEL 590 Directed Individual Study in Elementary Education**

★3 (*fi 6*) (variable, variable). Prerequisite: consent of Department.

**EDEL 595 Special Seminar in Elementary Education: Selected Topics**

★3 (*fi 6*) (either term, 0-3s-0).

**EDEL 596 Special Seminar in Elementary Education**

★6 (*fi 12*) (either term, 0-6s-0).

**EDEL 597 Special Seminar in Elementary Education**

★1-12 (*variable*) (variable, variable).

**EDEL 605 Theories and Models of Language**

★3 (*fi 6*) (either term, 3-0-0). Provides an advanced and in-depth examination of theories and models of language acquisition and development. The characteristics, purposes, and limitations of language theories and models are explored through the critical study of a range of theoretical perspectives. Prerequisite: EDEL 505 or consent of Department.

**EDEL 650 Curriculum Foundations and Inquiry**

★3 (*fi 6*) (either term, 0-3s-0). A required course for doctoral students in the Department of Elementary Education. Engages students in advanced examination of the historical foundations of the curriculum field, contemporary issues in curriculum, and current influences on curriculum. Through readings, discussions, and assignments, course participants will examine a number of perspectives for inquiring into educational practice, situating their own practice within the wider context of the field of curriculum studies, interpreting the language of curriculum, and considering the role of teachers in mediating curriculum with their students. The epistemological, ontological, axiological, and ideological bases for the forms of curriculum theory and inquiry will be studied. Prerequisite: EDEL 561 or consent of the Department.

**EDEL 660 Advanced Research in Education**

★3 (*fi 6*) (either term, 0-3s-0). This is a required course for doctoral students in the Department of Elementary Education. Provides students with opportunities to explore issues in educational research from a philosophical and historical perspective. Prior to choosing methods and data sources, a researcher must first be aware of and be able to defend his/her theoretical framework which is based on an understanding of ontology, epistemology, methodology and ethics. The purpose of this course is to expose students to the perspectives, issues and questions in these four areas so that they may begin to develop a philosophical understanding of the research process. Prerequisite: EDEL 567 or consent of the Department.

**EDEL 665 Qualitative Research Methods in Education**

★3 (*fi 6*) (either term, 3-0-0). Provides for in-depth study of qualitative research. Attention is given to research design, data collection, analysis, interpretation, and reporting. Credit cannot be given for this course if the student has already completed EDEL 568.

**EDEL 667 Interpretive Inquiry**

★3 (*fi 6*) (either term, 3-0-0). Intended to support participants in examining the topics within interpretive inquiry in depth; writing about their research approaches, and undertaking analyses and interpretations of data. Intended to be helpful to students wishing to undertake research that can be understood as basic or generic qualitative research or as interpretive inquiry. Prerequisite: EDEL 665 or equivalent.

**EDEL 690 Individual Project**

★3 (*fi 6*) (variable, variable). Comprehensive problems in Curriculum and Instruction-Elementary. Prerequisite: consent of Department.

**EDEL 691 Individual Project**

★6 (*fi 12*) (variable, variable). Comprehensive problems in Curriculum and Instruction-Elementary. Prerequisite: consent of Department.

**EDEL 900 Directed Research Project**

★3 (*fi 6*) (variable, unassigned).

**231.106 Education - Elementary and Secondary, EDES**

Departments of Elementary and Secondary Education  
Faculty of Education

**Undergraduate Courses****EDES 145 Mixed Chorus**

★0 (*fi 2*) (two term, 0-0-4). A music ensemble designed to provide education students with practical experience in the organization, administration and literature of the mixed chorus. Note: This is a credit/no credit course.

**EDES 251 Education Handbell Ringers I**

★3 (*fi 6*) (two term, 0-2L-0). This course examines repertoire, performance practice, rehearsal techniques and program administration of the handbell choir through a process of practical application. Prerequisite: successful completion of an audition of music reading skills.

**EDES 301 Introduction to Teaching in the Middle Years**

★3 (*fi 6*) (either term, 3-0-0). This course is an overview of the roles of the teacher in middle years and provides an overview of the middle level curriculum. This course will provide an analysis of the unique nature of middle years education and middle years student. Emphasis is placed upon strategies for planning instruction and assessment within a positive classroom environment. (Restricted to students in the Middle Years Program offered at Red Deer.)

**EDES 340 Active and Interactive Curriculum and Instruction in the Middle Years**

★3 (*fi 6*) (either term, 3-0-0). Based on the distinct developmental and societal needs of adolescents, this course will examine the social and curricular frameworks for learning and teaching. It will include theoretical and practical implications of the active and interactive nature of adolescent learning, incorporating a wide range of process and strategies. Prerequisite: Introductory Professional Term. (Restricted to students in the Middle Years Program offered at Red Deer.)

**EDES 346 Resource-Based Teaching**

★3 (*fi 6*) (either term, 3-0-0). An introduction to planning active learning experiences using school library materials and other resources, with a focus on how teachers and teacher-librarians cooperatively implement the curriculum.

**EDES 348 Reading in the Junior and Senior High School**

★3 (*fi 6*) (either term, 3-0-0).

**EDES 351 Education Handbell Ringers II**

★3 (*fi 6*) (two term, 0-2L-0). This course examines repertoire, performance practice, rehearsal techniques and program administration of the handbell choir through a process of practical application. Prerequisite: EDES 251

**EDES 361 Introduction to Curriculum and Instruction in Middle Years Art**

★3 (*fi 6*) (either term, 3-0-0). This course provides an introduction to visual arts education for middle years. It is comprised of lectures, discussions, audio-visual presentations, and hands-on media experiences. No visual arts background necessary. Prerequisite: Introductory Professional Term. (Restricted to students in the Middle Years Program offered at Red Deer.)

**EDES 362 Language Arts in the Middle Years**

★3 (*fi 6*) (either term, 3-0-0). This course will introduce the language arts curriculum and will give a broad overview of the knowledge and skills required to implement a language arts program in middle years classrooms. Prerequisite: Introductory Professional Term. (Restricted to students in the Middle Years Program offered at Red Deer.)

**EDES 363 Communication Through Mathematics in Middle Years Education**

★3 (*fi 6*) (either term, 3-0-0). This course provides an introduction to the teaching and learning of mathematics in the middle years. The focus will be on using curriculum, strategies, planning and resources to meet student needs. Prerequisite: Introductory Professional Term. (Restricted to students in the Middle Years Program offered at Red Deer.)

**EDES 364 Curriculum and Instruction in Middle Years Physical Education**

★3 (*fi 6*) (either term, 3-0-0). This course is designed to prepare students to teach Physical Education effectively in the middle years. The goals to this end integrate understanding of child development, physical education, health, curriculum and instruction and making curricula links. Prerequisite: Introductory Professional Term. (Restricted to students in the Middle Years Program offered at Red Deer.)

**EDES 365 Curriculum and Instruction in Middle Years Science Education**

★3 (*fi 6*) (either term, 3-0-0). Provides an introduction to teaching middle years children about science and 'design and make' technology. Such themes as children's learning, science/technology/society connections, the Alberta program, planning and instruction and assessing children's progress will be explored.



Prerequisite: Introductory Professional Term. (Restricted to students in the Middle Years Program offered at Red Deer.)

### **EDES 366 Curriculum and Instruction in Middle Years Social Studies**

★3 (fi 6) (either term, 3-0-0). An introduction to planning, resources, curriculum and strategies for meeting middle years students' needs through social studies. Prerequisite: Introductory Professional Term. (Restricted to students in the Middle Years Program offered at Red Deer.)

### **EDES 401 Conference Seminar**

★3 (fi 6) (either term, 0-3s-0).

### **EDES 402 Conference Seminar**

★6 (fi 12) (either term, 0-6s-0).

### **EDES 403 Conference Seminar**

★1-12 (variable) (variable, variable).

### **EDES 404 Special Topics in Art Process**

★3 (fi 6) (either term, 1-0-4). This course combines a specific studio focus and an exploration of performance art traditions with the goal of guiding students toward an understanding of the role that the audience plays in art. This course is open to all Art Education majors and minors. Other Education and Fine Art majors may also register by consent of Department. Prerequisite: ★6 ART and ★3 ART H, or comparable experience before taking this course.

### **EDES 409 Aboriginal Curriculum Perspectives**

★3 (fi 6) (either term, 3-0-0). This course is designed to help educators better understand and interpret the significance of recent curricular initiatives in Alberta and across Canada that emphasize Aboriginal perspectives across subject areas and grade levels. The class will consider the philosophies and wisdom traditions of Aboriginal knowledge systems and the curricular and pedagogical implications of these. The class will also focus on in particular subject area concerns, individually and collectively, and consider the critical contributions that Aboriginal knowledge systems and perspectives could play in these classroom contexts. One of the unifying messages of this course is that Aboriginal curriculum perspectives provide a unique opportunity for teachers to creatively rethink and reframe their approaches to teaching and learning.

### **EDES 440 Constructing Integrated Curriculum in the Middle Years**

★3 (fi 6) (either term, 3-0-0). Focuses on constructing integrated curriculum for middle years classrooms. Includes the examination of resources and existing middle years curriculum with a view to implementation and assessment. Prerequisite: Introductory Professional Term. (Restricted to students in the Middle Years Program offered at Red Deer.)

### **EDES 451 Education Handbell Ringers III**

★3 (fi 6) (two term, 0-2L-0). This course examines repertoire, performance practise, rehearsal techniques and program administration of the handbell choir through a process of practical application. Prerequisite: EDES 351.

## **Graduate Courses**

### **EDES 501 Conference Seminar**

★3 (fi 6) (either term, 0-3s-0).

### **EDES 502 Conference Seminar**

★6 (fi 12) (either term, 0-6s-0).

### **EDES 504 Special Topics in Art Process**

★3 (fi 6) (either term, 1-0-4). This course combines a specific studio focus and an exploration of performance art traditions with the goal of guiding students toward an understanding of the role that the audience plays in art as a form of communication and a way of learning. Prerequisite: ★6 in ART and ★3 in ART H, or consent of Department.

### **EDES 509 Teaching Science in Elementary and Secondary Schools**

★3 (fi 6) (either term, 3-0-0). This course allows students to consider at the graduate level current trends in learning theory, teaching strategies, program development and assessment which affect teaching science in schools.

### **EDES 540 Introduction to Teacher-Librarianship**

★3 (fi 6) (either term, 3-0-0). Study of the concept and management of school library media resource centres in elementary and secondary schools. Includes policies and policy development; program development and scheduling; processes for acquiring, cataloguing and circulating materials; facilities planning; budgeting and staffing. Note: Not open to students with credit in LIS 540.

### **EDES 541 School Library Collection Development**

★3 (fi 6) (either term, 3-0-0). Focuses on the principles and practices related to planning, building and maintaining information resource collections and resource-sharing systems, as well as handling the issues and demands that arise related to information resources in schools.

### **EDES 542 Inquiry-Based Instruction**

★3 (fi 6) (either term, 3-0-0). Planning, implementing and evaluating inquiry-based learning experiences in schools. Includes media and information literacy, the process approach to student research, collaborative planning, and the role of the teacher-librarian.

### **EDES 545 Information Technologies for Learning**

★3 (fi 6) (either term, 3-0-0). Focus on the integration of information technologies, including the Internet, into the K-12 curriculum to enhance student learning outcomes and to develop information literacy and critical thinking skills. Consideration of the management of information technologies in schools and the provision of staff development programs in technology-related areas.

### **EDES 546 School Library Information Materials**

★3 (fi 6) (either term, 3-0-0). Focuses on the principles and practices of organizing print and non-print resources generally acquired in school libraries. The primary goal is to familiarize students with current operations and techniques associated with the organization for access, physical processing and maintenance of collections of learning resources. Focuses on the professional tasks of cataloguing and classifying information.

### **EDES 547 Organization of School Library Materials**

★3 (fi 6) (either term, 3-0-0). Focuses on the principles and practices of organizing print and non-print resources generally acquired by school libraries. The primary goal is to familiarize students with current operations and techniques associated with the organization for access, physical processing and maintenance of collections of learning resources. Focuses on the professional tasks of cataloguing and classifying information.

### **EDES 549 Leadership in Information Literacy**

★3 (fi 6) (either term, 0-3s-0). Current issues and challenges related to the development of information literacy programs in schools are examined in this course using a case-based learning approach. Designed to help teacher-librarians draw from major theoretical frameworks within their profession to address problems of practice. Prerequisites: LIS 540, EDES 542, and EDES 545; or consent of Department.

### **EDES 601 Conference Seminar**

★3 (fi 6) (either term, 0-3s-0).

## **231.107 Education - Enseignement, EDU E**

Faculté Saint-Jean

### **Cours de 1er cycle**

#### **EDU E 232 Introduction aux stratégies générales d'enseignement**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-2). Cours d'introduction aux stratégies d'enseignement qui vise à outiller l'apprenant dans les domaines tels que la planification (y compris l'introduction au programme d'études), le questionnement, les directives et le travail de groupe. Ce cours comprend des ateliers pratiques d'enseignement. Notes: Ce cours n'est pas accessible aux étudiants ayant des crédits pour EDUC 201 et EDU E 332. Ce cours est réservé aux étudiant(e)s du programme BED.

#### **EDU E 331 Introduction générale à l'éducation**

★3 (fi 6) (l'un ou l'autre semestre, 1-0-4). Ce cours comprend deux parties. Une partie est centrée sur l'étude des thèmes tels que la perception de l'enseignant dans la société, l'enseignant comme modèle linguistique, la réflexion professionnelle, les multiples rôles de l'enseignant et la profession d'enseignant. L'autre partie du cours est une expérience pratique d'observation participante vécue dans le milieu scolaire. Ce cours n'est pas accessible aux étudiants ayant des crédits pour EDUC 200 et EDU E 231. Ce cours est réservé aux étudiant(e)s du programme BED.

#### **EDU E 433 La communication et la gestion en salle de classe**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude approfondie des modèles théoriques et pratiques de gestion en salle de classe. L'application des habiletés de communication nécessaires pour une gestion efficace sera aussi abordée. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour EDUC 300.

#### **EDU E 434 L'enseignant professionnel**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Ce cours comprend deux parties. Une partie est centrée sur un projet synthèse découlant du développement d'un portfolio professionnel. L'autre partie traite de la structure du système d'éducation en Alberta, la responsabilité des enseignants devant les lois et envers la communauté scolaire ainsi que les obligations professionnelles.

## **231.108 Education - Field Experience, EDFX**

Division of Field Experiences

Faculty of Education

### **Notes**

- (1) Field Experience courses other than EDFX 476 and 490 are normally not offered in Spring/Summer.
- (2) The Fee Index for these courses is one unit higher due to the practicum placement fees. See the Fee Payment Guide in the University Regulations and Information for Students section of the calendar.
- (3) The course prefix for Education (Field Experience) courses has changed from EDFXP to EDFX.

## Undergraduate Courses

### EDFX 325 Elementary Route Field Experience for the Introductory Professional Term

★3 (fi 6) (either term, 5 weeks full-time in schools). Prerequisite: EDPY 200. Note: This prerequisite does not apply to After Degree students. Corequisites: EDPS 310 and EDEL 321 or EDEL 330, EDEL 305 and EDPY 303. Note: Successful completion of the on-campus portion of the IPT is required prior to being granted permission to continue into EDFX 325. Requires payment of additional miscellaneous fees. Students are not permitted to enroll or work on courses additional to the IPT.

### EDFX 350 Secondary Route Field Experience for the Introductory Professional Term

★3 (fi 6) (either term, 5 weeks full-time in schools). Prerequisite: EDPY 200. Note: This prerequisite does not apply to After Degree students. Corequisites: EDPS 310 and EDSE 3XX (Curriculum and Teaching in Secondary Minor, EDSE 307 and EDPY 303. Note: Successful completion of the on-campus portion of the IPT is required prior to being granted permission to continue into EDFX 350. Requires payment of additional miscellaneous fees. Students are not permitted to enroll or work on courses additional to the IPT.

### EDFX 425 Elementary Route: Generalist Field Experience for the Advanced Professional Term

★9 (fi 18) (either term, 9 weeks full-time in schools). Prerequisites: Introductory Professional Term and ★15 of EDEL courses. Corequisites: EDEL 3XX (★3 from Education Core II not yet completed) and EDPS 410. Note: Successful completion of the corequisites is required prior to students being granted permission to commence EDFX 425. Requires payment of additional miscellaneous fees (see §22.2.3). Students are not permitted to enroll or work on courses additional to the APT.

### EDFX 426 Elementary Route: Special Education Field Experience for the Advanced Professional Term

★9 (fi 18) (either term, 9 weeks full-time in schools). Prerequisites: Introductory Professional Term, ★15 of EDEL courses, and completion of all courses in the Special Education Minor. Corequisites: EDEL 3XX (★3 from Education Core II not yet completed) and EDPS 410. Note: Successful completion of the corequisites is required prior to students being granted permission to commence EDFX 426. Requires payment of additional miscellaneous fees (see §22.2.3). Students are not permitted to enroll or work on courses additional to the APT.

### EDFX 450 Secondary Route Field Experience for the Advanced Professional Term

★9 (fi 18) (either term, 9 weeks full-time in schools). Prerequisites: Introductory Professional Term, ★24 in the Major, EDSE 4XX (Curriculum and Teaching in Secondary Major), and 4XX (Curriculum and Teaching in Secondary Major). Corequisite: EDSE 451. Note: Successful completion of the prerequisites is required prior to students being granted permission to commence EDFX 450. Requires payment of additional miscellaneous fees (see §22.2.3). Students are not permitted to enroll or work on courses additional to the APT.

### EDFX 476 Field Experience at the Postsecondary Level II

★3 (fi 6) (either term, 3 weeks full-time in schools). Course requires payment of additional miscellaneous fees (see §22.2.3).

### EDFX 490 Additional Placement in an Education Related and/or Outside Alberta Context

★1-6 (variable) (variable, variable). Prerequisites: Introductory Professional Term and permission of the Assistant Dean, Field Experiences. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

### EDFX 497 Field Experience in Adult Education

★1-12 (variable) (variable, variable). Prerequisite: permission of Professional Officer, Field Experiences.

### EDFX 498 Field Experience in the Elementary School

★1-12 (variable) (variable, variable). Prerequisite: permission of Professional Officer, Field Experiences.

### EDFX 499 Field Experience in the Secondary School

★1-12 (variable) (variable, variable). Prerequisite: permission of Professional Officer, Field Experiences.

## 231.109 Education - Fondements, EDU F

Faculté Saint-Jean

### Cours de 1er cycle

#### EDU F 235 École et société : Les enjeux de la diversité contemporaine

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Ce cours constitue une introduction à l'étude des relations entre l'école publique et la société. Il vise à sensibiliser les étudiants aux enjeux de la société pluraliste en rapport avec le milieu scolaire. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour FO ED 200.

The most current Course Listing is available on Bear Tracks.

#### EDU F 238 Histoire de la pensée en éducation

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Revue des grandes écoles de pensée qui ont influencé l'éducation en Occident. Les étudiants seront appelés à réfléchir sur chacune de ces écoles de pensée et à se situer par rapport aux implications éducatives de chacune de ces écoles de pensée. Chaque thème sera accompagné de ses implications dans la salle de classe et dans l'acte éducatif. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour FO ED 302.

#### EDU F 336 Contexte particulier des écoles françaises en milieu minoritaire

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Cours de fondement à l'intention des futurs enseignants qui se dirigent vers l'enseignement dans les écoles françaises en milieu minoritaire. L'histoire de l'école française, de son rôle, de ses buts, de ses programmes et des besoins auxquels elle doit répondre soulignera la relation particulière entre l'école francophone et la société. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FO ED 307.

#### EDU F 337 Contexte particulier dans les écoles d'immersion

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Cours de fondement à l'intention des futurs enseignants qui se dirigent vers l'enseignement dans les écoles d'immersion française. L'historique, le rôle, les buts, les enjeux et les traits distinctifs de la pédagogie de l'immersion française seront abordés.

## 231.110 Education - Instructional Technology, EDIT

Department of Educational Psychology  
Faculty of Education

### Undergraduate Courses

#### EDIT 202 Technology Tools for Teaching and Learning

★3 (fi 6) (either term, 3-0-3). Provides undergraduate Education students with the basic skills for using the most common information technology tools currently applied in schools. The types of tools include internet tools, digital media processing, multimedia/hypermedia presentations, spreadsheets, and databases. The course offers a number of advanced modules dealing with more complex topics in these areas plus additional tools such as those for editing digital video and sound. Students may not receive credit for both EDIT 202 and any of EDPY 202, EDPY 302, EDPY 485 or EDIT 485. Students are encouraged to register in this course as early in their program as possible. May contain alternative delivery sections; see 'Details of Courses' section. Prerequisite: Basic computer skills within a Macintosh or MS Windows environment including word processing, e-mail, and use of a Web browser. May include alternate delivery sections, refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar

#### EDIT 435 The Internet: Communicating, Accessing and Providing Information

★3 (fi 6) (either term, 3-0-3). An introduction to the Internet and to the use of basic Internet tools. Prerequisites: Experience with either Microsoft Windows or the Macintosh OS, basic file creation and management, and a word processor is required. Students may not receive credit for both EDIT 435 and EDPY 435.

#### EDIT 486 Interactive Multimedia

★3 (fi 6) (either term, 3-0-3). This course emphasizes students as builders of video games as opposed to players of video games and addresses the pedagogy of using this process to teach K-12 students. Lectures will focus on educational theory, specifically, social constructivist and constructionist frameworks and their relevance to current learners and their perspectives on technology use. The lab components will explore various game development environments which are designed for K-12 students. Through the construction of video games, students will learn how to promote problem-solving skills and critical thinking in their own students. Prerequisite: EDIT 202 or EDIT 485 or an introductory course in computing science. Credit will not be granted for both EDIT 486 and EDIT 568 or EDPY 486.

#### EDIT 488 Instructional Technology and Communication

★3 (fi 6) (either term, 3-0-0). This course treats instructional technology as a communications system for teaching and learning. In addition to exploring communication concepts, the course examines the communications components of visual learning and the specific tools and techniques of digital presentation and interaction. Overviews of current and future practice plus research on communication are included. This course is taught in an alternative delivery format. Prerequisite: EDIT 202 or EDIT 485 or an introductory course in computing science. Students will not be granted credit for both EDIT 488 and EDPY 488.

#### EDIT 489 Virtual Schools: Designing and Teaching Lessons Online

★3 (fi 6) (either term, 3-0-3). Techniques and concepts of instructional design in the school setting, especially for distance/alternate delivery and individualized instruction. Included are techniques for designing instruction for cyber schools, virtual schools, home schooling, and other forms of distance and alternate delivery. Prerequisite: EDIT 202 or EDPY 202 or EDIT 485 or EDPY 485 or consent of Department. Students will not be granted credit for EDIT 489 and EDPY 489.

<https://www.beartracks.ualberta.ca>

## Graduate Courses

### EDIT 535 The Internet: Communicating, Accessing, and Providing Information

★3 (fi 6) (either term, 3-0-3). An introduction to the Internet and to use of basic Internet tools. Prerequisite: Experience with either Microsoft Windows or the Macintosh OS, basic file creation and management, and a Word Processor are required.

### EDIT 573 Designing Technology-Based Instruction

★3 (fi 6) (either term, 3-0-0). Explores contemporary approaches to the instructional design process in education and training. Emphasis is placed on the application of research and practice related to a number of topics including planning models, learning and performance issues, instructional strategies, and message design and evaluation. Also deals with newer alternatives to conventional ISD especially constructivist approaches.

### EDIT 578 Internship in Instructional Technology

★3 (fi 6) (either term, 3-0-3). Note: credit cannot be earned for both EDIT 578 and EDIT 579.

### EDIT 583 Digital Elements for Multimedia Production

★3 (fi 6) (either term, 3-0-3). Pre- or corequisites: EDIT 572 and 573, consent of Department.

## 231.111 Education - Methodologie et Curriculum, EDU M

Faculté Saint-Jean

### Cours de 1er cycle

#### EDU M 210 Moi comme apprenant de langue (élémentaire)

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). L'apprenant sera au centre d'une réflexion sur l'acquisition et l'apprentissage de sa langue maternelle et d'une langue seconde. Dans ce cours, les étudiants seront initiés aux théories socioculturelles de l'apprentissage d'une langue. C'est en explorant les différentes approches pédagogiques que l'apprenant sera invité à prendre conscience de ses attitudes, ses valeurs et son comportement vis-à-vis l'apprentissage et l'utilisation de la langue. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 308.

#### EDU M 251 Moi comme apprenant de langue (secondaire)

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). L'apprenant sera au centre d'une réflexion sur l'acquisition et l'apprentissage de sa langue maternelle et d'une langue seconde. Dans ce cours, les étudiants seront initiés aux théories socioculturelles de l'apprentissage d'une langue. C'est en explorant les différentes approches pédagogiques que l'apprenant sera invité à prendre conscience de ses attitudes, ses valeurs et son comportement vis-à-vis l'apprentissage et l'utilisation de la langue. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 308.

#### EDU M 311 Moi comme enseignant de langue

★3 (fi 6) (l'un ou l'autre semestre, 3-0-2). Ce cours portera sur l'intégration des savoirs théoriques et pratiques en littérature personnelle, scolaire et communautaire. Une approche expérientielle/analytique sera favorisée. Dans le but de se sensibiliser au programme d'études, les étudiants prépareront des séquences didactiques qu'ils exécuteront auprès d'un auditoire cible dans les contextes francophones et d'immersion française. Préalable: EDU M 210. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 309.

#### EDU M 315 Enseignement de l'éducation physique au niveau élémentaire

★3 (fi 6) (l'un ou l'autre semestre, 0-3L-0). Les approches pédagogiques pour l'enseignement en français de l'éducation physique à l'élémentaire. La programmation; les diverses méthodologies et stratégies d'enseignement; les systèmes d'évaluation de l'enfant et du programme. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 326.

#### EDU M 316 Enseignement de la musique au niveau élémentaire I

★3 (fi 6) (l'un ou l'autre semestre, 0-3L-0). Préalable(s): MUSIQ 151 et 155/156 ou l'équivalent. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 339.

#### EDU M 317 Initiation à la création artistique en milieu scolaire

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Découverte du langage de l'art, de sa spécificité et de son esthétique. Introduction par atelier aux principes fondamentaux des programmes d'études concernés. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour CU ME 345.

#### EDU M 318 Apprendre à lire / Lire pour apprendre

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Par le truchement de la littérature jeunesse, les étudiants se pencheront sur le processus de lecture, les stratégies d'enseignement de lecture ainsi que sur la découverte et la création d'oeuvres littéraires appropriées pour les élèves au niveau élémentaire. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 410.

#### EDU M 319 Littérature pour la petite enfance

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Ce cours vise l'éveil aux facettes de la littérature dans le monde de la petite enfance. L'apport linguistique, culturel et familial serviront de base pour explorer les enjeux pédagogiques à considérer dans les propos d'enseignement pour les jeunes enfants.

#### EDU M 320 Didactiques de l'anglais au niveau élémentaire

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Initiation à l'enseignement de l'anglais à l'élémentaire. Sujets étudiés: les programmes du ministère de l'Éducation, les stratégies et techniques d'enseignement et d'évaluation.

#### EDU M 321 Pédagogie et perfectionnement musical (Kodály et Orff)

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Travail vocal et formation auditive conduisant à la maîtrise des relations mélodiques et des formules rythmiques de base. Application des idées maîtresses de la philosophie de Kodály et d'Orff. Démarches pédagogiques au premier cycle (guide pédagogique, outils didactiques, leçons modèles.) Analyse et animation d'un répertoire folklorique de chansons.

#### EDU M 341 Les technologies de l'information et de la communication (TIC) en éducation

★3 (fi 6) (l'un ou l'autre semestre, 3-0-2). Regard critique sur le rôle et la place de la technologie à l'école ainsi que les méthodes d'enseignement propices à son intégration dans les matières de base. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 347.

#### EDU M 342 L'enseignement moral et religieux

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Revue des principes fondamentaux en éducation morale et religieuse. Fondements de l'enseignement moral et religieux dans une société libérale-démocratique. Perspectives de l'enseignement moral et religieux dans les écoles confessionnelles et non-confessionnelles. Implications pratiques dans la salle de classe et dans l'acte éducatif. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 496.

#### EDU M 358 Enseignement de la musique au niveau secondaire I

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). L'enseignement du chant choral et l'administration d'un ensemble vocal à l'école secondaire. Les sujets tels que le recrutement et les auditions des choristes, l'échauffement vocal, le choix de répertoire, les techniques de répétition et la planification de concerts seront tous abordés. Préalable(s) ou concomitant(s): ★9 dans la spécialisation. Incluant : MUSIQ 140 et 315. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 387.

#### EDU M 359 Enseignement de la musique au niveau secondaire II

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). L'enseignement d'une fanfare et l'administration d'un ensemble instrumental à l'école secondaire. Les sujets tels que la création d'une fanfare, le recrutement et les auditions de musiciens, le choix d'instrument, les techniques de répétition, le choix de répertoire et la planification de concerts seront tous abordés. Préalable(s) ou concomitant(s): ★9 dans la spécialisation incluant MUSIC 141 et un de MUSIC 209, 211 ou 216. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 388.

#### EDU M 360 L'art dramatique comme outil pédagogique

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Ce cours portera sur les pratiques théâtrales et leur utilisation dans les programmes d'études à l'élémentaire et au secondaire; par exemple, jeux de rôles, marionnettes, improvisation. exemple, jeux de rôles, marionnettes, improvisation. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 389.

#### EDU M 361 Enseignement de l'éducation physique au niveau secondaire

★3 (fi 6) (l'un ou l'autre semestre, 0-3L-0). Les approches pédagogiques pour l'enseignement en français de l'éducation physique au secondaire, la programmation; les diverses méthodologies et stratégies d'enseignement; les systèmes d'évaluation de l'élève et du programme. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 494.

#### EDU M 362 Didactiques de l'anglais au niveau secondaire

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Initiation à l'enseignement de l'anglais au secondaire. Sujets étudiés: les programmes du ministère de l'Éducation, les stratégies et techniques d'enseignement et d'évaluation.

#### EDU M 412 Didactique des mathématiques au niveau élémentaire

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Initiation à l'enseignement des mathématiques à l'élémentaire. Sujets étudiés: les programmes d'études, stratégies et techniques d'enseignement et d'évaluation, les calculatrices, les ordinateurs, la communication, la pensée et la compréhension mathématique, les influences sur l'enseignement/l'apprentissage des mathématiques, les techniques d'évaluation. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 321.

#### EDU M 413 Didactiques des sciences au niveau élémentaire

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Initiation à l'enseignement des sciences à l'élémentaire. Sujets étudiés: les programmes du ministère de l'Éducation, les stratégies et techniques d'enseignement et d'évaluation, le lien entre science/technologie/société. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 322.

#### EDU M 414 Didactiques des études sociales à l'élémentaire

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Initiation à l'enseignement des études sociales à l'élémentaire. Étude et interprétation des exigences du programme du ministère de l'Éducation et des ressources prescrites pour enseigner les études



sociales en milieu francophone et en milieu d'immersion française. Sensibilisation au rôle que jouent les études sociales dans le développement du citoyen et l'éveil à la conscience identitaire. Planification de l'enseignement des études sociales et stratégies d'enseignement. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 330.

#### **EDU M 452 Enseignement du français au niveau secondaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Cours de méthodologie pour l'enseignement du français en immersion et en milieu francophone minoritaire. Étude des nouvelles tendances dans la didactique de l'écriture. Principes et démarche pour la planification d'une séquence d'apprentissage basée sur les stratégies d'écriture dans le contexte d'un type de texte spécifique. Intégration de la grammaire à la production écrite. Méthodes d'évaluation des textes. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 358.

#### **EDU M 453 Enseignement de la littérature au niveau secondaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Pédagogie générale et pratique de la littérature: méthode d'enseignement du roman, de la pièce de théâtre et de la poésie. Étude des moyens de favoriser la pratique de la lecture libre en français. Étude des processus et des stratégies de lecture. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 359.

#### **EDU M 454 Enseignement des études sociales au 1er cycle du secondaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Pédagogie générale et pratique de l'enseignement des études sociales; analyse des programmes d'études sociales pour les Francophones en milieu minoritaire et pour le milieu d'immersion française; étude des ressources prescrites par le ministère de l'Éducation; étude des méthodes d'enseignement et d'évaluation, des objectifs d'apprentissage et le rôle et les responsabilités de l'enseignant des études sociales. Préalable: ★6 dans la spécialisation. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 360.

#### **EDU M 455 Enseignement des études sociales au 2e cycle du secondaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Pédagogie générale et pratique de l'enseignement des études sociales; analyse des programmes d'études sociales et des ressources prescrites par le ministère de l'Éducation; étude de l'historique des études sociales et des conceptions d'études sociales; étude des méthodes d'enseignement et d'évaluation des études sociales; et intégration de l'actualité aux objectifs du programme d'études sociales. Préalable ou concomitant: EDU M 454. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 361.

#### **EDU M 456 L'enseignement des mathématiques au niveau secondaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Ce cours a pour but de préparer les étudiants à enseigner les mathématiques à tous les niveaux du secondaire; d'acquérir quelques principes fondamentaux nécessaires à une conception adéquate des mathématiques et de leur didactique. Ce cours propose diverses stratégies pour encourager l'apprentissage des mathématiques d'une façon concrète. Préalable: ★3 dans la spécialisation. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 363.

#### **EDU M 457 L'enseignement des sciences au niveau secondaire**

★3 (fi 6) (l'un ou l'autre semestre, 0-3L-0). Ce cours permettra à l'étudiant de connaître à fond le contenu et les objectifs du curriculum de sciences à tous les niveaux du secondaire; les différentes méthodes de présenter un concept en science; les nouvelles applications technologiques dans l'enseignement de la science; et l'équipement existant pour faciliter l'enseignement de la science. Préalable: ★3 dans la spécialisation. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 367.

#### **EDU M 485 Etude personnelle dirigée dans le domaine de l'enseignement au niveau élémentaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Préalable(s): l'approbation du professeur et du Vice-doyen aux affaires académiques. Exemple, jeux de rôles, marionnettes, improvisation. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 444.

#### **EDU M 490 Séminaire dans le domaine de l'enseignement au niveau secondaire**

★3 (fi 6) (l'un ou l'autre semestre, 0-3s-0). Le contenu du cours varie d'une année à l'autre. Les sujets sont annoncés avant la période d'inscription. Le titre du cours figurera sur le relevé de notes de l'étudiant. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 498.

#### **EDU M 495 Etude personnelle dirigée dans le domaine de l'enseignement au niveau secondaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Préalable(s): l'approbation du professeur et du Vice-doyen aux affaires académiques. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour CU ME 499.

#### **EDU M 498 Séminaire dans le domaine de l'enseignement au niveau élémentaire/secondaire**

★3 (fi 6) (l'un ou l'autre semestre, 0-3s-0). Le contenu du cours varie d'une année à l'autre. Les sujets sont annoncés avant la période d'inscription. Le titre du cours figurera sur le relevé de notes de l'étudiant.

## 231.112 Education - Policy Studies, EDPS

Department of Educational Policy Studies  
Faculty of Education

### Undergraduate Courses

#### **EDPS 310 Managing the Learning Environment**

★3 (fi 6) (either term, 3-0-1). This course will assist students in clarifying the influence of social and organizational contexts and structures and help them explore the ways in which teachers can participate as professionals in the process of managing the learning environment. Prerequisites: EDPY 200 except for After Degree students. Corequisite: Courses in the Introductory Professional Term for either the Elementary Education Route or Secondary Education Route. Successful completion of the on-campus portion of the IPT is required prior to being granted permission to continue into EDFX 325 or EDFX 350.

#### **EDPS 311 Anthropology and Canadian Education**

★3 (fi 6) (either term, 3-0-0). A review of the organization of schooling in Canada and of selected educational issues, from perspectives provided by socioculture, symbolic and biological anthropology. Students may not receive credit for both EDPS 311 and EDFDN 310.

#### **EDPS 341 Concepts of Childhood in History**

★3 (fi 6) (either term, 3-0-0). A study of those views of childhood which have exerted a significant influence on educational theory and practice over the last 200 years. Students may not receive credit for both EDPS 341 and EDFDN 341.

#### **EDPS 360 Society and Education**

★3 (fi 6) (either term, 3-0-0). The changing function and structures of education, with special reference to contemporary Canadian society. Students may not receive credit for both EDFN 360 and EDPS 360.

#### **EDPS 401 Selected Topics in Educational Policy Studies**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

#### **EDPS 402 Directed Study in Educational Policy Studies**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

#### **EDPS 410 Ethics and Law in Teaching**

★3 (fi 6) (either term, 3-0-0). This course will examine the ethical and legal responsibilities of teachers. Among the topics addressed will be the following: punishment and child abuse; freedom of speech and academic freedom in schools; parents' rights and teachers' professional autonomy; issues of quality such as inclusive education and the problems of racism and sexism; fairness in assessment and evaluation; teachers' private lives and public obligations; indoctrination and the teaching of value. Prerequisite: Completion of the Introductory Professional Term. Successful completion is required prior to being granted permission to commence EDFX 425 or EDFX 426. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **EDPS 411 Cross Cultural Studies in Education**

★3 (fi 6) (either term, 3-0-0). The ethnographic study of education and cultural change. Prerequisite: ANTHR 101, or ANTHR 207, or ANTHR 250, or consent of Department. Students may not receive credit for both EDPS 411 and EDFDN 410.

#### **EDPS 422 Education in Developing Countries**

★3 (fi 6) (either term, 3-0-0). This course has a hemispheric focus (developing areas in the South), and aims to help students critically understand and examine the role formal systems of education can play in stimulating inclusive and sustainable social development possibilities in the countries of Africa, Asia, Latin America, the Caribbean region, and, selectively, in the specific cases of indigenous populations who may be underdeveloped in the context of otherwise advanced economic and political systems. Students may not receive credit for both EDPS 422 and EDFDN 422.

#### **EDPS 425 Global Education: Issues and Strategies for Teachers**

★3 (fi 6) (either term, 3-0-0). This course explores, in theory and practice, how global education in schools can facilitate critical understanding and develop skills and values for building more peaceful futures in local, national, and global contexts. It draws on North and South scholars and educators to clarify underlying conceptual and pedagogical principles of global education and related fields (education for peace, justice, development, human rights, cultural solidarity, environmental care). Exemplars of creative curriculum content and teaching-learning strategies for global literacy will be included. Students may not receive credit for both EDPS 425 and EDFDN 425.

#### **EDPS 432 The Education of Native Peoples in Canada: An Historical Study**

★3 (fi 6) (either term, 3-0-0). An historical examination of the formal education provided Indian, Métis, and Inuit peoples with special attention to Aboriginal, missionary, and federal-provincial educational programs. Students may not receive credit for both EDPS 432 and EDFDN 432.

**EDPS 456 The Philosophy of Moral Education**

★3 (fi 6) (either term, 3-0-0). An examination of the philosophical problems that arise in the moral education of students. Students may not receive credit for both EDPS 456 and EDFN 456.

**EDPS 474 Contemporary Issues in the Education of Native Peoples: A Social Science Perspective**

★3 (fi 6) (either term, 3-0-0). An analysis of current issues of debate in Indian, Métis and Inuit education, with special reference to their social origins. Students may not receive credit for both EDPS 474 and EDFDN 474.

**Graduate Courses****EDPS 501 Conference Course on Selected Topics**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**EDPS 506 Individual Directed Study**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**EDPS 507 Individual Directed Study**

★3 (fi 6) (either term, 3-0-0).

**EDPS 509 Research Design and Data Analysis**

★3 (fi 6) (either term, 3-0-0). This course is a survey course of research design principles, concepts, and applications. Emphasis is on developing research methodologies and understanding data analyses for conducting various types of research. Prerequisite EDPS 508.

**EDPS 511 Evolving Concepts in Educational Administration and Leadership**

★3 (fi 6) (either term, 3-0-0). Students may not receive credit for both EDAL 501 and EDPS 511.

**EDPS 512 Administrative and Leadership Process in Education**

★3 (fi 6) (either term, 3-0-0). Students may not receive credit for both EDAL 502 and EDPS 512.

**EDPS 513 Educational Policy and Reform**

★3 (fi 6) (either term, 3-0-0). The intent of this course is to explore and further our understanding of reforms in education over the past two decades in Canada and other selected OECD countries. Through academic readings, we examine how and why particular policy discourses (e.g. school choice, system accountability) have become accepted in recent years. We further consider the implications of policy reforms for practices within educational organizations. The design of this course reflects the view that reforms cannot be comprehended without considering the social, political, economic and historical contexts in which they arise.

**EDPS 520 International Adult Education**

★3 (fi 6) (either term, 3-0-0). This course will examine the role and nature of adult education and learning processes in social change initiatives being undertaken by development non-governmental organizations (NGOs) and by popular subaltern social movements of pastoralists, peasants, indigenous peoples, rural women and urban poor (shack dwellers) social groups in Asia, Africa, Latin America and the Caribbean (Global South). These initiatives will be explored in terms of a critical contextual appreciation of the inter/national development project and neoliberal globalization. Students may not receive credit for both EDPS 501 "International Adult Education" and EDPS 520.

**EDPS 521 Adult Learning and Development**

★3 (fi 6) (either term, 3-0-0). In this course we will examine key issues in adult learning and development, using concepts discussed in the literature. Content areas include theories of adult learning and development, and related concepts such as learning styles and orientations, personality, motivation, and intelligence. Students may not receive credit for both EDAL 521 and EDPS 521.

**EDPS 522 Citizenship Education: Global Contexts**

★3 (fi 6) (either term, 3-0-0). Focuses on citizenship education as a primary program for the development of societies with special reference to South countries. The concepts as well as the possible practices of citizenship and citizenship education will be analyzed to discern and critique their influence on spaces of educational and social development.

**EDPS 523 Education and Development Theory**

★3 (fi 6) (either term, 3-0-0). Analyzes the role of education in the development process from a global perspective, with particular attention paid to Asia, Africa, and Latin America. Explores the various explanations for social, political, and economic development put forward by selected writers. Students may not receive credit for both EDFN 523 and EDPS 523.

**EDPS 525 Globalization, Global Education and Change**

★3 (fi 6) (either term, 3-0-0). This course will develop a critical understanding of select perspectives on globalization and the associated implications for: (a) formal, non-formal and informal education in local, national, and international contexts; and (b) pedagogical possibilities for critical global education in schools and communities addressing global issues pertaining to international development (poverty and inequality in North-South trajectories), ecology, human rights and improved prospects for peace.

**EDPS 526 Race, Racialization and Education**

★3 (fi 6) (either term, 3-0-0). The course examines the concept of race and its manifestations in society and the education system. We engage with the idea of race as philosophy, race as theorized by sociologists and race as a historical discourse. Further, the course highlights how such modes of analyses and conceptual frames are theorized, utilized and legitimized. Students may not receive credit for both EDPS 501 "Race, Racialization and Education" and EDPS 526.

**EDPS 527 Youth, Culture and Education**

★3 (fi 6) (either term, 3-0-0). This course explores the relationship between youth, culture and education particularly with reference to formal schooling. Students will be introduced to various critical cultural studies theories and sociological perspectives in order to understand how youth draw on cultural formations to relate to, resist, or accommodate schooling in contemporary western societies. Students may not receive credit for both EDPS 501 "Youth, Culture and Education" and EDPS 527.

**EDPS 532 Selected Topics in Educational Supervision**

★3 (fi 6) (either term, 3-0-0). Students may not receive credit for both EDAL 522 and EDPS 532.

**EDPS 535 Indigenous Research Methodologies**

★3 (fi 6) (either term, 3-0-0). This course examines various approaches, definitions, principles and practices that have been used to frame a discussion of Indigenous research methodologies. The course will provide opportunities for new insight, knowledge, and understanding about indigenous research paradigms and/or research methods, and to consider the relationship and impact of these on Indigenous peoples and communities. Students may not receive credit for both EDPS 601 "Indigenous Research Methodologies" and EDPS 535.

**EDPS 536 Critical Pedagogies and Transformative Practices in Indigenous Education**

★3 (fi 6) (either term, 3-0-0). This course is concerned with the practices and strategies of transformative pedagogies for indigenous education. It examines the nature of critical pedagogy and its application in indigenous education sites as a tool for policy analysis and for social and political transformation. A central focus of the course is the development of indigenous educational strategies of resistance and transformation addressing colonization.

**EDPS 537 Issues in Indigenous Education**

★3 (fi 6) (either term, 3-0-0). Course explores contemporary issues in Indigenous education as they are experienced within Indigenous communities in North America and elsewhere. The course prepares students for working in these communities as researchers and/or as practitioners. The course outcomes will inform further research, practice and training in Indigenous education. Students may not receive credit for both EDPS 601 "Issues in First Nations Education" and EDPS 537.

**EDPS 538 From Oral Language to Written Text**

★3 (fi 6) (either term, 3-0-0). Course examines orality and literacy as contested concepts that historically and in the present continue to impact perceptions of Indigenous/Aboriginal thought and Indigenous/Aboriginal ways of being by scholars and educators. Students may not receive credit for both EDPS 601 "From Oral Language to Written Text" and EDPS 538.

**EDPS 539 Revitalizing Indigenous Language**

★3 (fi 6) (either term, 3-0-0). Course studies the impact of the loss of Indigenous languages and strategies, policies and practices aimed at the revival and maintenance of Indigenous languages locally and internationally. Students may not receive credit for both EDPS 601 "From Oral Language to Written Text" and EDPS 538.

**EDPS 541 Organizational Learning and Change**

★3 (fi 6) (either term, 3-0-0). Introduces various theoretical and conceptual orientations to organizational learning and organizational change, and involves students in practical projects exploring learning and change in organizational contexts such as workplaces, communities, schools, and post-secondary institutions.

**EDPS 544 Critical and Feminist Pedagogical Research**

★3 (fi 6) (either term, 3-0-0). Examines historical and contemporary perspectives shaping critical and feminist pedagogies, both of which support inclusive and holistic teaching and research practices. Explores how these perspectives can inform research designs and methods for studying policy development, program design, and professional practice. Intent is to have students conduct analysis in relation to their own educational projects and professional interests.

**EDPS 545 Learning and the Workplace**

★3 (fi 6) (either term, 3-0-0). This course will focus on critical analysis of trends, policies and issues related to informal and formal learning of adults in, for, and through the workplace.

**EDPS 548 Global Governance and Issues in Educational Administration and Leadership**

★3 (fi 6) (either term, 3-0-0). This course offers a critical comparative analysis of issues related to the organization and leadership of educational institutions and organizations viewed within a global context. A key focus of the course is on governance and the structures and roles of multilateral and transnational

economic, political, social, and environmental organizations, institutions and systems in establishing discursive parameters for educational policy and practice. Students may not receive credit for both EDPS 501 Global Perspectives and Issues in Educational Administration and Leadership and EDPS 548.

**EDPS 551 Governance and Administration of Education in Canada**

★3 (fi 6) (either term, 3-0-0). Students may not receive credit for both EDAL 551 and EDPS 551.

**EDPS 553 Legal Aspects of Educational Administration**

★3 (fi 6) (either term, 3-0-0). Students may not receive credit for both EDAL 553 and EDPS 553.

**EDPS 554 The Epistemology and Ethics of Educational Research**

★3 (fi 6) (either term, 3-0-0). Provides opportunity to explore epistemological and ethical issues that arise both in the conduct of educational research and in its application to practice.

**EDPS 556 Seminar in Philosophy of Education**

★3 (fi 6) (either term, 3-0-0). This course will explore many of the philosophical questions that arise in educational settings, including those concerning the nature and aims of education, the curriculum, teaching, testing, equity and diversity, religious schooling, and moral education. The objectives are: to introduce a wide range of educational issues that are informed by philosophical thought; and to foster the skills and dispositions associated with philosophical thinking.

**EDPS 560 Instructional Practices in Adult and Higher Education**

★3 (fi 6) (either term, 3-0-0). This course examines the theoretical, conceptual, philosophical and practical aspects of adult instruction using dimensions such as instructor, learner, intentions, context, content, strategies and assessment. Students may not receive credit for both EDAE 560 and EDPS 560.

**EDPS 561 Program Planning in Adult and Higher Education**

★3 (fi 6) (either term, 3-0-0). The course examines program planning models and issues in contexts such as the workplace, community and post-secondary institutions. Students may not receive credit for both EDAE 561 and EDPS 561.

**EDPS 562 Social Theory and Education**

★3 (fi 6) (either term, 3-0-0). Students may not receive credit for both EDFN 562 and EDPS 562.

**EDPS 563 Education from a Sociological Perspective**

★3 (fi 6) (either term, 3-0-0). Students may not receive credit for both EDFN 560 and EDPS 563.

**EDPS 564 Education and Social Change**

★3 (fi 6) (either term, 3-0-0). Students may not receive credit for both EDFN 564 and EDPS 564.

**EDPS 565 Sociology of Higher Education**

★3 (fi 6) (either term, 3-0-0). Students may not receive credit for both EDFN 565 and EDPS 565.

**EDPS 571 The Organization of Postsecondary Education**

★3 (fi 6) (either term, 3-0-0). Students may not receive credit for both EDAL 571 and EDPS 571.

**EDPS 572 Administration of Postsecondary Institutions**

★3 (fi 6) (either term, 3-0-0). Prerequisite: EDAL 571 or EDPS 571 or consent of Department. Students may not receive credit for both EDAL 572 and EDPS 572.

**EDPS 577 Foundations of Adult and Higher Education**

★3 (fi 6) (either term, 3-0-0). This survey course examines the various interpretations and paradigms of adult and higher education. Ways of studying adult and higher education are presented using concepts, analysis, theories, and methodologies from the various foundational disciplines. Students may not receive credit for both EDAE 577 and EDPS 577.

**EDPS 578 Learning in Social Movements**

★3 (fi 6) (either term, 3-0-0). This course deals with historical and contemporary theories and practices of adult education as it is practiced in social movements and social action, both locally and internationally. The study of the pedagogical dimension includes experiential, transformative, social and political learning and teaching in diverse social movements. Students may not receive credit for both EDPS 501 "The Community Practice of Adult Education" and EDPS 578.

**EDPS 579 Transformative Learning**

★3 (fi 6) (either term, 3-0-0). This course provides an overview of the theory and practice of transformative learning within the field of adult education. Theories of education and social change and the radical tradition in adult education will be reviewed prior to an in-depth critique of the historical and contemporary transformative learning theories, key debates among them, and practices in specific socio-economic contexts. Students may not receive credit for both EDPS 501 "Transformative Learning" and EDPS 579.

**EDPS 580 Contemporary Issues in Education: Perspectives on Policy and Practice**

★3 (fi 6) (either term, 3-0-0). Introduces students to foundational approaches to contemporary issues in Canadian and international education contexts. Introduces

multidimensional approaches associated with the history, sociology, and philosophy of education to help students understand and critically assess educational policy and practice.

**EDPS 581 Introduction to Evaluating Educational Research**

★3 (fi 6) (either term, 3-0-0). Introduces students to a critical interpretation and evaluation of research in the specializations within the Department of Educational Policy Studies, using a wide range of orientations and approaches. Students may not receive credit for both EDPS 508 and EDPS 581.

**EDPS 585 Needs Assessment and Program Evaluation**

★3 (fi 6) (either term, 3-0-0). Students may not receive credit for both EDAE 585 and EDPS 585.

**EDPS 590 Foundations of Education: Perspectives on Canadian Issues**

★3 (fi 6) (either term, 3-0-0). Focuses on a critical examination of Canadian educational issues from philosophical, historical, sociological and cultural perspectives. Themes may include multiculturalism, educational reform and governance, the global economy and new technologies, changing nature of educational goals, and transformations in teaching.

**EDPS 591 Foundations of Education: Perspectives on International Issues**

★3 (fi 6) (either term, 3-0-0). Critically examines the role of education in the problems and prospects of international development. As an inclusive construct, development comprises enhancements in the economic, social, political, cultural and technological well-being of people's lives. Examines contemporary societal issues that influence and/or are influenced by educational policies and programs. Perspectives from regions and groups such as Africa, Asia, Latin America, Europe, the Oceania-Pacific, the Caribbean, the Middle East, and communities indigenous to different parts of the world will be included.

**EDPS 594 Group Processes in Educational Leadership**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Students may not receive credit for both EDAL 594 and EDPS 594.

**EDPS 601 Selected Topics in Educational Policy Studies**

★3 (fi 6) (either term, 3-0-0).

**EDPS 606 Supervised Individual Study I**

★3 (fi 6) (either term, 3-0-0).

**EDPS 607 Supervised Individual Study II**

★3 (fi 6) (either term, 3-0-0).

**EDPS 612 Research Methods II**

★3 (fi 6) (either term, 3-0-0). Students may not receive credit for both EDAL 612 and EDPS 612.

**EDPS 625 Administrative Behavior I**

★3 (fi 6) (either term, 3-0-0). Students may not receive credit for both EDAL 625 and EDPS 625.

**EDPS 635 Organization Theory I**

★3 (fi 6) (either term, 3-0-0). Students may not receive credit for both EDAL 635 and EDPS 635.

**EDPS 636 Indigenous Ontologies in the Global Context**

★3 (fi 6) (either term, 3-0-0). This course is concerned with the impact of the multifaceted processes of globalization on the lived realities of indigenous peoples with particular reference to education and schooling. These issues will be engaged across macro and micro levels to examine the international arena, the nation state and new forms of regionalism in the context of the reshaping of global order. Open to doctoral students. Other students require consent of the instructor.

**EDPS 655 Politics of Education I**

★3 (fi 6) (either term, 3-0-0). Students may not receive credit for both EDAL 655 and EDPS 655.

**EDPS 656 Politics of Education II**

★3 (fi 6) (either term, 3-0-0). Students may not receive credit for both EDAL 656 and EDPS 656.

**EDPS 671 Issues in Administration of Postsecondary Education I**

★3 (fi 6) (either term, 3-0-0). Students may not receive credit for both EDAL 671 and EDPS 671.

**EDPS 680 Policy Research and Education**

★3 (fi 6) (either term, 3-0-0). Focuses on a critical and disciplined examination of education and policy issues by drawing on a variety of theoretical orientations. Identifies the centrality of policy research within different educational contexts: adult education, K-12, post-secondary, and aboriginal schooling in Canada and internationally. Students will explore a multiplicity of ways to combine the study of policy with the study of practice, politics, culture and power.

**EDPS 681 Frameworks for Research in Educational Policy Studies**

★3 (fi 6) (either term, 3-0-0). Explores the philosophical underpinnings of selected research frameworks within the specializations of the Department of Educational



Policy Studies. Students may receive credit for only one of EDAL 611, EDPS 611 and EDPS 681.

### EDPS 900 Directed Research Project

★3 (fi 6) (either term, unassigned).

## 231.113 Education - Psychologie, EDU P

Faculté Saint-Jean

### Cours de 1er cycle

#### EDU P 239 Introduction au développement de l'enfant et de l'adolescent

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude du développement de l'enfant et de l'adolescent selon cinq grands axes qui progressent simultanément et sont étroitement reliés : physique, cognitif, conatif, affectif et social. À partir de ces domaines, le développement de l'être humain est abordé en insistant particulièrement sur le milieu scolaire actuel. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour PS ED 200.

#### EDU P 240 Psychopédagogie de l'apprentissage

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Théories générales de l'apprentissage et les différents facteurs qui influencent l'apprentissage en milieu scolaire. Études des applications de ces théories dans l'enseignement avec une mention sur la mesure et l'évaluation. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour PS ED 201.

#### EDU P 241 La communication et relations interpersonnelles

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Saisir l'importance de se connaître soi-même dans nos démarches d'améliorer nos habiletés communicationnelles. Étudier les éléments impliqués dans la communication interpersonnelle et leur interdépendance dans la construction d'un message. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour PS ED 250.

#### EDU P 330 Leadership en milieux éducatifs

★3 (fi 6) (aux deux semestres, 3-0-0). Cours portant sur le développement de connaissances et de compétences liées au leadership participatif dans les milieux éducatifs. Ce cours comprend une composante théorique ainsi qu'une composante pratique. Préalable ou concomitant: un cours en psychologie ou en sociologie, ou en psychologie de l'éducation, et l'accord du vice-doyen aux affaires académiques. Note: demi-cours que s'étend sur toute l'année.

#### EDU P 340 Mesure et évaluation

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Dans ce cours, le point sera mis sur une compréhension approfondie des principes-là et la pratique dans la classe. La deuxième composante du cours mettra l'accent sur l'analyse, la construction, et la critique des tests et différentes méthodes d'évaluations en groupes et en projets individuels.

#### EDU P 442 Inclusion scolaire et modèles d'intervention

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude des politiques, des normes et du système de codification en vigueur pour les élèves albertains ayant des besoins particuliers. Analyse des modèles courants d'inclusion scolaire. Étude des attitudes et croyances des enseignants envers l'inclusion scolaire. Rédaction d'un plan d'intervention selon les règles de l'art. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour PS ED 300.

#### EDU P 443 Sensibilisation aux troubles du développement et de l'apprentissage

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude des principaux troubles du développement et de l'apprentissage comme par exemple, l'autisme, le trouble déficitaire de l'attention/hyperactivité, la dyslexie développementale et le trouble de l'audition centrale. Élaboration de stratégies pédagogiques visant à répondre aux besoins des élèves du primaire et du secondaire ayant des troubles du développement et de l'apprentissage. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour PS ED 482.

## 231.114 Education - Psychology, EDPY

Department of Educational Psychology  
Faculty of Education

**Note:** The course prefix for Education (Psychology) courses has changed from EDPY to EDPY.

### Undergraduate Courses

#### EDPY 200 Educational Psychology for Teaching

★3 (fi 6) (either term, 3-0-0). This course deals with the teaching learning process and student behavior. It includes theory, research, and illustrations, all dealing with the classroom application of psychological principles. Topics typically covered are student development, student learning and instruction, individual and group differences in student abilities, and student motivation. The course presents the basic principles of effective teaching and learning using a

balanced theoretical orientation. Students may not receive credit for both EDPY 200 and EDPY 371.

#### EDPY 301 Inclusive Education: Adapting Instruction for Students with Special Needs

★3 (fi 6) (either term, 3-0-0). This course provides an introduction to teaching students with special needs within the inclusive education context. Course content focuses on knowledge of special needs and exceptionalities (learner characteristics), familiarity with individualized Program Plans (IPPs), program modifications and adaptations, classroom management, and assessment. A major focus in the course is on Differentiated Instruction which facilitates the development of an awareness of how diverse contexts affect students and teachers. Prerequisite: Successful completion of the Introductory Professional Term.

#### EDPY 303 Educational Assessment

★3 (fi 6) (either term, 3-0-0). This course will introduce students to the complexity of classroom assessment as a means of supporting and measuring student learning. The intent of this course is to develop an understanding of important concepts and issues in the evaluation of a learner's knowledge and skills, and to develop competence in constructing instruments and processes to evaluate learner performance. Corequisite: Courses in the Introductory Professional Term for either the Elementary Education Route or Secondary Education Route. Successful completion of the on-campus portion of the IPT is required prior to being granted permission to continue into EDPY 325 or EDPY 350.

#### EDPY 397 Educational Psychology Seminars

★1-3 (variable) (either term, variable). Prerequisite: consent of Department.

#### EDPY 402 Child Development for Educators

★3 (fi 6) (either term, 3-0-0). The course will include theoretical and practical aspects of physical, cognitive, psychological, moral, social, and emotional development of children. Prerequisite: EDPY 200 or consent of Department.

#### EDPY 404 Adolescent Development for Educators

★3 (fi 6) (either term, 3-0-0). Prerequisite: EDPY 200. Students may not receive credit for both EDPY 404 and EDPY 329.

#### EDPY 410 Individual Differences in Education

★3 (fi 6) (either term, 3-0-1). Prerequisite: EDPY 200. Students may not receive credit for both EDPY 410 and EDPY 475.

#### EDPY 413 Principles and Practice in Teaching ESL Learners

★3 (fi 6) (either term, 3-0-0). Basic strategies for adapting instruction to accommodate ESL learners in their classes. Second language literacy, content-based instruction, and assessment will be covered. Not open to EDPY TESL Diploma or Master's students.

#### EDPY 416 Introduction to the Teaching of English as a Second Language

★3 (fi 6) (either term, 3-0-0). Focuses on principles of language learning, language learners, and learning contexts. Pre-/corequisite: LING 101

#### EDPY 417 Grammar of English for Teachers of Adult ESL

★3 (fi 6) (either term, 3-0-0). The aim of this course is to develop students' explicit knowledge of English grammar, which provides the conceptual basis for grammar instruction. Emphasis will be placed on developing students' ability to provide explanations of the most important grammar rules for adult ESL and to design grammar focused activities. Pre-corequisites: LING 101 or equivalent and EDPY 416 (corequisite with permission).

#### EDPY 418 Methodology in the Teaching of English as a Second Language to Adults

★3 (fi 6) (either term, 3-0-0). Students will learn how to respond to adult ESL students' learning needs using current ESL teaching principles and techniques, design lesson plans, evaluate resources, and assess learner progress. Prerequisites: EDPY 416.

#### EDPY 419 TESL Supervised Practicum

★3 (fi 6) (either term, 3-0-3). This practicum is designed to provide Diploma students with an opportunity to observe and teach in an established ESL program for adults.

#### EDPY 432 Interpersonal Communication for Teachers

★3 (fi 6) (either term, 1.5-1.5s-0). Prerequisite: EDPY 200. Students may not receive credit for both EDPY 432 and EDPY 495.

#### EDPY 442 Introduction to Counselling

★3 (fi 6) (either term, 1.5-1.5s-0). Provides an overview of the field of Counselling Psychology, including its theoretical foundations, applications, and counselling skills. Prerequisite: EDPY 200 or consent of Department.

#### EDPY 446 Hope and the Helping Relationship

★3 (fi 6) (either term, 3-0-0). Focuses on the theory, research, and practice of hope within classroom, counselling, and related professional settings. Addresses the impact of hope in individual, relational, and institutional contexts and explores current research in the area of hope enhancement.

#### EDPY 452 Assessment and Instruction of Exceptional Learners

★3 (fi 6) (either term, 3-0-0). This course focuses on the role of the special

educator with regard to assessment of, and instructional programming for, students having special learning needs. Note: Special Education Minor-Elementary Route only. Prerequisite: Introductory Professional Term. Students may not receive credit for EDPY 452 and any of EDPSY 355, EDPSY 307 or EDPY 468.

#### **EDPY 454 Teaching Students with Challenging Behaviours**

★3 (fi 6) (either term, 3-0-0). This course focuses on understanding and managing the challenging behaviours of children and adolescents with emotional and behavioural problems in schools. Note: Students may not receive credit for both EDPY 454 and EDPSY 307 or EDPSY 357.

#### **EDPY 456 Consultation and Collaboration in Special Education**

★3 (fi 6) (either term, 3-0-0). Provides understanding of collaborative consultation as a process to enable teachers to work together with all stakeholders to generate strategies for educating students with special needs. Prerequisite: Introductory Professional Term.

#### **EDPY 458 Assessment and Programming for Children with a Specific Reading Disability**

★3 (fi 6) (either term, 3-0-0). Intent is to (a) provide students with a theoretical understanding of specific reading disabilities, (b) introduce students to widely used assessment tools and the interpretation of assessment results, and (c) develop competence in designing and implementing successful instructional programs for students with specific reading disabilities. Prerequisite: EDPY 303 or consent of the instructor.

#### **EDPY 468 Assessment and Instruction for Adolescents with Special Needs**

★3 (fi 6) (either term, 3-0-0). This course focuses on assessment, curriculum, and teaching for adolescents with special needs and is the required curriculum and teaching course for the Secondary Special Education Minor. Note: Special Education Minors-Secondary Route only. Prerequisite: Introductory Professional Term. Successful completion is required prior to being granted permission to continue into the second week of EDPY 350.

#### **EDPY 470 Deafness: An Introduction and Survey**

★3 (fi 6) (either term, 3-0-0). This course provides a general understanding of the development and education of deaf and hard of hearing children highlighting the impact that deafness has upon both the process and products of language development. Students may not receive credit for both EDPY 470 and EDPSY 449.

#### **EDPY 472 Introduction to Language Development**

★3 (fi 6) (either term, 3-0-0). Provides an overview to the study of child language development and an introduction to educational considerations in teaching students with language or communication disorders. Students may not receive credit for both EDPY 472 and EDPSY 450.

#### **EDPY 474 Introduction to American Sign Language**

★3 (fi 6) (either term, 2-1s-1). This is a practical course to develop basic skills in American Sign Language. Students may not receive credit for both EDPY 474 and EDPSY 451. Not to be taken by students with credit in ASL 111.

#### **EDPY 497 Senior Seminars**

★1-3 (variable) (either term, variable). Content varies from year to year. Topics announced prior to registration period. Prerequisite: consent of Department.

#### **EDPY 499 Directed Individual Study in Educational Psychology**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

## Graduate Courses

**Note:** Graduate students in M ED and PH D programs in the Department of Educational Psychology may register in 500 and 600 level courses open to web registration. Others require consent of the Department.

#### **EDPY 500 Introduction to Data Analysis in Educational Research**

★3 (fi 6) (either term, 3-0-3). Prerequisite: consent of Department. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **EDPY 501 Introduction to Methods of Educational Research**

★3 (fi 6) (either term, 3-0-3). Prerequisite: consent of Department.

#### **EDPY 502 Single-Case Research Design**

★3 (fi 6) (either term, 3-0-0). Focuses on theory and practice of research on the effects of intervention on an individual or small group.

#### **EDPY 503 Qualitative Methods of Education Research**

★3 (fi 6) (either term, 3-0-3). An introduction to the theoretical perspectives, principles, processes, and methods of qualitative research. Prerequisite: EDPY 501 or equivalent or consent of Department.

#### **EDPY 505 Advanced Univariate Statistics in Educational Research**

★3 (fi 6) (either term, 3-0-3). Prerequisites: EDPY 500 or equivalent and consent of Department.

#### **EDPY 507 Test Theory**

★3 (fi 6) (first term, 3-0-0). Prerequisites: EDPY 500 or equivalent, and consent of Department.

#### **EDPY 508 Item Response Theory**

★3 (fi 6) (either term, 3-0-0). Topics in educational and psychological measurement will be covered using an item response theory framework. Basic issues in model selection, parameter estimation, and model-data fit will be studied for both unidimensional and multidimensional models. Selecting topics such as test construction, equating, differential item functioning, and computerized adaptive testing will also be discussed. Prerequisites: EDPY 507 or equivalent and consent of Department.

#### **EDPY 509 Child Development: Theories and Issues**

★3 (fi 6) (either term, 3-0-0). Emphasis is on understanding child development from the combined perspectives of research, theory and practical experience. Stages from prenatal to the teenage years will be studied. Intended for both masters and doctoral level students. Practitioners or theoreticians from related disciplines are welcome. Prerequisite: consent of Department.

#### **EDPY 510 Learning, Cognition and Education**

★3 (fi 6) (either term, 3-0-0). This course is concerned with aspects of human learning, cognition, and the practical application of these theories and methods within education.

#### **EDPY 517 Adolescent Development: Theories and Issues**

★3 (fi 6) (either term, 3-0-0). Emphasis is on understanding adolescent development from the combined perspectives of research, theory and practical experience. Stages from early adolescence until emerging adulthood will be studied. Intended for both masters and doctoral level students. Practitioners or theoreticians from related disciplines are welcome. Prerequisite: consent of Department.

#### **EDPY 521 Principles of Psychological Assessment I**

★3 (fi 6) (either term, 3-0-0). This course deals with psychological and psychoeducational assessment and covers the basic principles and skills needed to administer and interpret individual intelligence tests. Restricted to students enrolled in the School Psychology or Counselling Psychology programs. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **EDPY 523 The Practice of School Psychology**

★3 (fi 6) (either term, 3-0-0). This course is intended to develop an appreciation for the professional issues and problems of concern to the school psychologist. Topics will include history and trends, evaluation and accountability, research and interventions, and international perspectives. This course includes a Field Placement component. Restricted to School Psychology students.

#### **EDPY 525 Principles of Psychological Assessment II**

★3 (fi 6) (second term, 3-0-3). This course deals with psychological and psychoeducational assessment and covers the basic principles and skills needed to administer and interpret individual intelligence tests. This course includes a Field Placement. Restricted to School Psychology students. Prerequisite: EDPY 521.

#### **EDPY 531 Developing an Effective School Counselling Program**

★3 (fi 6) (either term, 3-0-0). Addresses methods of needs evaluation, counselling program design, and program evaluation within school counselling settings. Includes key issues such as parent conferences, counsellor roles, and professional consultations. Restricted to course-based MEd School Counselling students.

#### **EDPY 532 Systems of Counselling**

★3 (fi 6) (either term, 3-0-0). This course introduces the major theories used in counselling/psychotherapy. Registration priority given to students enrolled in the School Psychology or Counselling Psychology programs. Prerequisite: consent of Department.

#### **EDPY 533 Basic Skills, Issues and Attitudes in Counselling I**

★3 (fi 6) (first term, 3-3s-4). This practicum course focuses on the development of foundational skills, knowledge and attitudes necessary for the professional practice of counselling. Prerequisite: Registration is restricted to School Psychology and Counselling Psychology students.

#### **EDPY 534 Basic Skills, Issues and Attitudes in Counselling II**

★3 (fi 6) (second term, 3-3s-4). Registration is restricted to School Psychology and Counselling Psychology students. Prerequisite: EDPY 533 or equivalent.

#### **EDPY 536 Ethical and Professional Issues in Psychological Practice**

★3 (fi 6) (either term, 3-1.5s-0). This course is designed to increase knowledge of ethical, legal, and professional standards of psychological practice. Registration priority given to students enrolled in the School Psychology or Counselling Psychology programs. Prerequisite: consent of Department.

#### **EDPY 538 Theory and Practice in Group Counselling**

★3 (fi 6) (either term, 3-0-3). This course is designed to develop an understanding of group theory and process and to acquire skills needed in leading a counselling group. Prerequisites or corequisites: EDPY 533 and 534.

#### **EDPY 540 Counselling Psychology: Field Placement**

★6 (fi 12) (two term, 0-3s-3). Field placement with a community-based counselling practicum as well as a seminar that focuses on professional and clinical issues related to the practicum experience. Prerequisite: EDPY 532, 533, 534, 536 and consent of Department. Restricted to course-based MEd Counselling Psychology students.

**EDPY 541 Selected Topics in School Counselling**

★3 (*fi 6*) (either term, 3-0-0). Addresses key issues, concerns, and challenges commonly encountered in school counselling practice, and appropriate counselling responses and strategies. Restricted to course-based MEd School Counselling students.

**EDPY 542 Cross-Cultural Counselling**

★3 (*fi 6*) (either term, 3-0-0). Designed to establish a theoretical and practical understanding of the factors that influence the nature and effectiveness of the cross-cultural counselling process. Includes multicultural counselling competencies, ethics in cross-cultural counselling interactions, models of racial and cultural identity development, multicultural assessment procedures, and culture-specific (emic) and universal (etic) helping styles. Registration priority given to students enrolled in the School Psychology, Counselling Psychology or Teaching English as a Second Language programs. Prerequisite: consent of Department.

**EDPY 544 Principles of Psychological Testing and Assessment**

★3 (*fi 6*) (either term, 3-0-1). Prerequisite: consent of Department.

**EDPY 545 Individual Psychological Assessment**

★6 (*fi 12*) (two term, 3-0-3). Theory, principles, and practice of psychological assessment. Students will gain clinical experience in working with individuals referred for psychological assessment. Prerequisite: EDPY 521. Registration is restricted to School Psychology and Counselling Psychology students. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**EDPY 546 Hope and the Helping Relationship**

★3 (*fi 6*) (either term, 3-0-0). Focuses on the theory, research, and practice of hope within classroom, counselling, and related professional settings. Addresses the impact of hope in individual, relational, and institutional contexts and explores current research in the area of hope enhancement.

**EDPY 549 Advanced Psychoeducational Assessment and Instruction**

★3 (*fi 6*) (first term, 3-0-1). To provide skill in administration and interpretation of a variety of psychoeducational measures which show potential in advancing our understanding of exceptional children. This course includes a Field Placement component. Restricted to School Psychology students. Prerequisites: EDPY 452 and consent of Department.

**EDPY 550 School Counselling Practicum**

★6 (*fi 12*) (two term, 0-3s-3). Practicum course consists of a supervised school counselling field placement as well as a clinic-based instructional seminar that focuses on professional and clinical issues related to the practicum experience. Prerequisites: EDPY 533, 534, and consent of Department. Restricted to course-based MEd School Counselling students.

**EDPY 554 Behavior Management for Exceptional Individuals**

★3 (*fi 6*) (either term, 0-4L-0). To provide skill in implementing behavior management practices in classroom settings as well as skills for assisting teachers to implement behavior management techniques. Prerequisite: consent of Department.

**EDPY 555 Advanced Assessment and Intervention for Reading Disabilities**

★3 (*fi 6*) (either term, 3-0-0). This course provides students with an understanding of reading disabilities, introduces them to relevant assessment tools, and examines how to design and implement successful interventions for students with reading disabilities.

**EDPY 556 Problems and Issues in Special Education: Prevalence of Exceptionalities and Professional Practice**

★3 (*fi 6*) (first term, 3-0-0). Aspects of theory, research and professional practice within the field of special education will be examined in this class. All special needs and developmental disorders are considered, particularly in the realm of theory/practice relationships. Such issues as program evaluation, integration, personnel preparation, and the identification of special needs will be considered. Validity of current practices and beliefs will be addressed through reviews of research, theory, and legislation/policy and the relationship between these areas and professional practice. Prerequisite: consent of Department.

**EDPY 560 Seminar on Research in Special Education**

★3 (*fi 6*) (either term, 0-3s-0). Contemporary research and applications regarding children exhibiting exceptionalities are reviewed from the perspectives of current research paradigms and methods. Students apply these qualitative and quantitative models of exploration and knowledge development in terms of better informed practice and more adequate theory development. Pre-/corequisites: EDPY 501 or equivalent and consent of Department.

**EDPY 561 Behavior Disorders of Childhood and Adolescence**

★3 (*fi 6*) (either term, 2-1s-0). In depth treatment of basic topics, including definition, classification, models, assessment, education, treatment and prevention. Prerequisites: EDPY 301 or equivalent and consent of Department.

**EDPY 573 Computer-Assisted Language Learning (CALL)**

★3 (*fi 6*) (either term, 3-0-3). Acquaints students with a wide variety of CALL opportunities available for the English as a Second Language (ESL) classroom, presents guidelines for evaluating CALL resources, and provides a framework

for the effective integration of CALL into ESL curricula. Basic familiarity with the computer and the Internet is required. Prerequisite: EDPY 418 or consent of the Department.

**EDPY 575 Teaching English as a Second Language (TESL) Supervised Practicum**

★3 (*fi 6*) (either term, 3-0-3). This practicum is designed to provide Master's students with an opportunity to observe and teach in an established ESL program for adults.

**EDPY 581 Psychological Aspects of Bilingualism and Bilingual Education**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the study of bilingualism. Deals with the following questions: What is bilingualism? How do we measure bilingualism? How does a person become bilingual? What are the consequences of individual and societal bilingualism? Prerequisites: LING 101 or equivalent approved by Department.

**EDPY 585 Teaching and Learning Grammar in Second Language Education**

★3 (*fi 6*) (either term, 3-0-0). Explores how grammar teaching can be contextualized according to the principles of communicative language teaching. Theories concerning the relationship between adult learners' implicit and explicit knowledge of grammar will be reviewed, and different approaches to grammar instruction will be explored. Prerequisite: EDPY 416 or equivalent, and EDPY 417 or equivalent, and EDPY 418 or equivalent, and consent of Department.

**EDPY 588 Teaching English as an International Language**

★3 (*fi 6*) (either term, 3-0-0). Issues relating to the teaching of English as a global language are explored. A general approach to analyzing the teaching of English for international communication in different settings is developed. Topics may include: functions of language; diglossia; World Englishes; language endangerment; language planning; communicative language teaching in non-Western settings; content-based instruction; washback in language testing. Prerequisite: EDPY 416; or equivalent with consent of Department.

**EDPY 590 Classroom Research Issues in Second Language Learning**

★3 (*fi 6*) (either term, 3-0-0). Introduction to applied linguistics research in second or foreign language classrooms. Topics typically include: methods of classroom research; teacher-student interaction; the effect of feedback on learner errors; form-focussed instruction; strategy training. Prerequisite: EDPY 416, 418, 501; or equivalent with consent of Department.

**EDPY 591 Teaching Literacy and Reading to ESL Learners**

★3 (*fi 6*) (either term, 3-0-0). Theory and practice in the instruction of literacy and reading to ESL students. Prerequisite: LING 101 and EDPY 416.

**EDPY 593 ESL Assessment and Evaluation**

★3 (*fi 6*) (either term, 3-0-0). Introduction to assessment practices and procedures in ESL/EFL. Prerequisite: LING 101.

**EDPY 594 Teaching Pronunciation to ESL Learners**

★3 (*fi 6*) (either term, 3-0-0). Introduction to relevant research and specific classroom teaching strategies. Prerequisite: LING 101 and EDPY 416.

**EDPY 595 Settlement Adjustment Issues for ESL Immigrants to Canada**

★3 (*fi 6*) (either term, 3-0-0). Focuses on political, curricular, social, cultural, and linguistic factors that have an impact on immigrants to Canada.

**EDPY 596 Program Development in the Teaching of ESL**

★3 (*fi 6*) (either term, 3-0-0). This course encompasses, planning, needs analysis, syllabus design, program implementation, classroom implementation and evaluation in ESL/EFL programs. Prerequisite: LING 101, EDPY 416, and EDPY 418.

**EDPY 597 Special Seminars**

★1-6 (*variable*) (either term, variable). Content varies from year to year. Topics announced prior to registration period. The student's transcript carries title descriptive of content. May be repeated. Prerequisite: consent of Department.

**EDPY 599 Individual Directed Reading and Research**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: consent of Department.

**EDPY 604 Mixed Methods Approaches to Educational Research**

★3 (*fi 6*) (either term, 3-0-0). Introduction to mixed methods research as a means of conducting educational research. Within each of the major mixed methods designs, the research problems addressed, data collection and analysis strategies, and reporting venues are discussed. Prerequisites: EDPY 501 or equivalent and consent of Department. Additional methods courses in quantitative and qualitative research are recommended.

**EDPY 605 Multivariate Statistical Methods in Education Research**

★3 (*fi 6*) (second term, 3-0-3). Prerequisites: EDPY 505 or equivalent and consent of Department. Formerly EDPY 506.

**EDPY 606 Doctoral Research Seminar in Educational Psychology**

★3 (*fi 6*) (second term, 0-3s-0). A research seminar course designed to help students develop and defend a doctoral level research proposal in educational psychology. Although this is a second term course, students are also required to attend several course sessions in the first term. Please consult with the course instructor prior to registration. Prerequisite: consent of Department.



**EDPY 608 Selected Topics in Educational Measurement**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: EDPY 507 or equivalent.

**EDPY 609 Selected Topics in Human Development**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: EDPY 509 or EDPY 517 or equivalent.

**EDPY 610 Selected Topics in Learning, Cognition and Instruction**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: EDPY 510 or equivalent.

**EDPY 612 Research Practicum in Psychological Studies in Education**

★6 (*fi 12*) (two term, 3-3s-8). This doctoral level practicum is designed to provide students with the opportunity to acquire community-research experience. There are two components to the course: (a) the community research placement, and (b) the professional development seminars. The professional development seminars are designed to address a number of topics in this area, as well as expose students to a number of current professional issues facing educational psychologists working in the research community. Prerequisites: completed first year of doctoral studies. Consent of department.

**EDPY 614 Social and Emotional Development**

★3 (*fi 6*) (either term, 3-0-0). Examines current theoretical, methodological, and applied issues in social and emotional behavioural development. Discussion of atypical development will also be incorporated. Open to Master's and PhD students in the Department of Educational Psychology. Other students require consent of the Department. Prerequisite: EDPY 509 or EDPY 517 or equivalent.

**EDPY 615 Program Evaluation**

★3 (*fi 6*) (either term, 3-0-0). This course will introduce students to the theoretical ideas and practical applications of program evaluation. Prerequisites: EDPY 501 or equivalent and consent of Department.

**EDPY 621 Advanced Seminar in Special Education**

★3 (*fi 6*) (either term, 0-3s-0). Deals with the theoretical foundations and current applied developments in the field of special education and student exceptionality. Prerequisite: consent of Department

**EDPY 630 Counselling Psychology Internship**

★3 (*fi 6*) (two term, variable). Students in the Doctoral Counselling Program must successfully complete a 1,600 hour internship accredited by the Canadian Psychological Association (or equivalent). Students must complete pre-session study seminars related to the internship application process, interviewing skills, and ranking of internship sites/decision making. Students are expected to participate in the Association of Psychology Postdoctoral and Internship Centers (APPIC) matching process. Prerequisites: Consent of Department, completion of required coursework and completion of doctoral candidacy exam.

**EDPY 632 History and Systems of Psychology**

★3 (*fi 6*) (either term, 3-0-0). Provides a historical examination of the philosophical and scientific development of the discipline of psychology. Prerequisite: consent of Department.

**EDPY 633 Advanced Counselling Practicum I**

★3 (*fi 6*) (first term, 3-3s-3). This doctoral level practicum is designed to provide students with an opportunity to develop an approach to counselling that is congruent with professional, social and scientific standards, is sufficiently flexible to address the range of human variability, and is facilitative of client change. Prerequisite: EDPY 533 and 534 or equivalent. Pre- or corequisites: EDPY 632 and consent of Department.

**EDPY 634 Advanced Counselling Practicum**

★3 (*fi 6*) (either term, 3-3s-3). This doctoral level practicum is a continuation of EDPY 633. Prerequisite: EDPY 633 and consent of Department.

**EDPY 635 Counselling Speciality: Theory and Practice**

★3 (*fi 6*) (either term, 3-3s-3).

**EDPY 640 Theories and Models of Diagnostic Assessment**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: EDPY 545 or equivalent, and consent of Department.

**EDPY 641 Advanced Personality Assessment**

★3 (*fi 6*) (either term, 3-0-3). This course will focus on the use and interpretation of clinical tools used for identification of mental health and personality functioning in both children and adults. Includes field placement component. Prerequisites: EDPY 545 and one of EDPY 640 or equivalent, and consent of Department.

**EDPY 642 Applied Neuropsychological Assessment: Clinical Counselling and School**

★3 (*fi 6*) (either term, 3-0-3). An overview of the neurobiological aspects of development and principles of neuropsychology. Prerequisites: EDPY 545 and one of EDPY 640 or 641, or equivalent, and consent of Department.

**EDPY 650 School Psychology Internship**

★1 (*fi 2*) (two term, variable). A supervised training program designed to provide the intern with a planned, programmed sequence of training experience. Students in the doctoral program in School Psychology must successfully complete an approved 1,600 hour internship. Prerequisites: Consent of Department, successful completion of coursework and candidacy exam.

**EDPY 680 Seminar in Teaching English as a Second Language**

★3 (*fi 6*) (either term, 0-3s-0). This seminar will give doctoral students the opportunity to become acquainted with research and theory in educational linguistics.

**EDPY 697 Special Seminars**

★1-6 (*variable*) (either term, variable). Prerequisite: consent of Department. Content varies from year to year. Topics announced prior to registration period. The student's transcript carries title descriptive of content. May be repeated.

**EDPY 699 Individual Directed Reading and Research**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: consent of Department.

**EDPY 900 Research/Capping Project**

★3 (*fi 6*) (two term, unassigned).

**EDPY 903 Directed Research Project**

★3 (*fi 6*) (either term, variable).

## 231.115 Education - Secondary, EDSE

(Curriculum and Instruction)  
Department of Secondary Education  
Faculty of Education

**Note:** The course prefix for Education (Secondary) courses has changed from EDSEC to EDSE.

### Undergraduate Courses

**EDSE 305 Curriculum and Teaching in Secondary Schools**

★3 (*fi 6*) (either term, 3-0-0). This course is intended to help educators learn about themselves as a secondary school teacher, planning for teaching in a secondary school, ideas and policies that impact the planning for teaching in a secondary school; and their role in contributing to the teaching profession. Prerequisite: Successful completion of the Introductory Professional Term.

**EDSE 307 Language, Literacy and Society in Educational Contexts**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★9 in the Major subject area. Corequisite: Courses in the Introductory Professional Term for the Secondary Education Route. Successful completion of the on-campus portion of the IPT is required prior to being granted permission to continue into EDFX 350. EDSE 307 is designed to prepare teachers to develop English language and literacy abilities in learners in grades 7 through 12, particularly diverse and minority learners.

**EDSE 312 Curriculum and Teaching for Secondary School Art Majors I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★9 in the Major subject area. Corequisite: Courses in the Introductory Professional Term for the Secondary Education Route. Successful completion of the on-campus portion of the IPT is required prior to being granted permission to continue into EDFX 350.

**EDSE 313 Curriculum and Teaching for Secondary School Art Minors**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: ★9 in the Minor subject area and successful completion of the Introductory Professional Term for the Secondary Education Route. Note: Not open to students whose Major is Art.

**EDSE 317 Curriculum and Teaching for Secondary School Career and Technology Studies Majors I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: ★9 in the Major subject area. Corequisite: Courses in the Introductory Professional Term for the Secondary Education Route. Successful completion of the on-campus portion of the IPT is required prior to being granted permission to continue into EDFX 350.

**EDSE 318 Curriculum and Teaching for Secondary School Career and Technology Studies Minors**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: ★9 in the Minor subject area and successful completion of the Introductory Professional Term for the Secondary Education Route. Note: Not open to students whose Major is Career and Technology Studies.

**EDSE 322 Curriculum and Teaching for Secondary School Drama Majors I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★9 in the Major subject area. Corequisite: Courses in the Introductory Professional Term for the Secondary Education Route. Successful completion of the on-campus portion of the IPT is required prior to being granted permission to continue into EDFX 350.

**EDSE 323 Curriculum and Teaching for Secondary School Drama Minors**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: ★9 in the Minor subject area and successful completion of the Introductory Professional Term for the Secondary Education Route. Note: Not open to students whose Major is Drama.

**EDSE 327 Curriculum and Teaching for Secondary School English Language Arts Majors I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★9 in the Major subject area. Corequisite: Courses in the Introductory Professional Term for the Secondary Education Route. Successful completion of the on-campus portion of the IPT is required prior to being granted permission to continue into EDFX 350.

**EDSE 328 Curriculum and Teaching for Secondary School English****Language Arts Minors**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: ★9 in the Minor subject area and successful completion of the Introductory Professional Term for the Secondary Education Route. Note: Not open to students whose Major is English Language Arts.

**EDSE 333 Curriculum and Teaching for Secondary School Health Minors**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★9 in the Minor subject area and successful completion of the Introductory Professional Term for the Secondary Education Route.

**EDSE 337 Curriculum and Teaching for Secondary School Mathematics Majors I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★9 in the Major subject area. Corequisite: Courses in the Introductory Professional Term for the Secondary Education Route. Successful completion of the on-campus portion of the IPT is required prior to being granted permission to continue into EDFX 350.

**EDSE 338 Curriculum and Teaching for Secondary School Mathematics Minors**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: ★9 in the Minor subject area and successful completion of the Introductory Professional Term for the Secondary Education Route. Note: Not open to students whose Major is Mathematics.

**EDSE 343 Curriculum and Teaching Music in the Secondary School: Wind Band I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: ★9 in the Major subject area to include MUSIC 213, 214 and 315. Corequisite: Courses in the Introductory Professional Term for the Secondary Education Route. Successful completion of the on-campus portion of the IPT is required prior to being granted permission to continue into EDFX 350.

**EDSE 344 Curriculum and Teaching Music in the Secondary School: Class Guitar**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: the ability to read music in the treble clef and successful completion of the Introductory Professional Term for the Secondary Education Route. The teaching of class guitar in the context of the Alberta Secondary Schools General Music Curricula. Note: Students must provide their own guitar, which must be approved by the course instructor.

**EDSE 347 Curriculum and Teaching for Secondary School Physical Education Majors I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★9 in the Major subject area. Corequisite: Courses in the Introductory Professional Term for the Secondary Education Route. Successful completion of the on-campus portion of the IPT is required prior to being granted permission to continue into EDFX 350.

**EDSE 348 Curriculum and Teaching for Secondary School Physical Education Minors**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: ★9 in the Minor subject area and successful completion of the Introductory Professional Term for the Secondary Education Route. Note: Not open to students whose Major is Physical Education.

**EDSE 352 Curriculum and Teaching for Secondary School Biological Sciences Majors I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★9 in the Major subject area. Corequisite: Courses in the Introductory Professional Term for the Secondary Education Route. Successful completion of the on-campus portion of the IPT is required prior to being granted permission to continue into EDFX 350.

**EDSE 353 Curriculum and Teaching for Secondary School Biological Sciences Minors**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: ★9 in the Minor subject area and successful completion of the Introductory Professional Term for the Secondary Education Route. Note: Not open to students whose Major is Biological Sciences, Chemistry, General Sciences, Physical Sciences or Physics.

**EDSE 360 Curriculum and Teaching for Secondary School General Sciences Majors I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★9 in the Major subject area. Corequisite: Courses in the Introductory Professional Term for the Secondary Education Route. Successful completion of the on-campus portion of the IPT is required prior to being granted permission to continue into EDFX 350.

**EDSE 361 Curriculum and Teaching for Secondary School General Sciences Minors**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: ★9 in the Minor subject area and successful completion of the Introductory Professional Term for the Secondary Education Route. Note: Not open to students whose Major is Biological Sciences, Chemistry, General Sciences, Physical Sciences or Physics.

**EDSE 364 Curriculum and Teaching for Secondary School Physical Sciences Majors I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★9 in the Major subject area. Corequisite: Courses in the Introductory Professional Term for the Secondary Education Route.

Successful completion of the on-campus portion of the IPT is required prior to being granted permission to continue into EDFX 350.

**EDSE 366 Curriculum and Teaching for Secondary School Physical Sciences Minors**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: ★9 in the Minor subject area and successful completion of the Introductory Professional Term for the Secondary Education Route. Note: Not open to students whose Major is Biological Sciences, Chemistry, General Sciences, Physical Sciences or Physics.

**EDSE 368 Curriculum and Teaching for Secondary School Second Language Majors I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★9 in the Major subject area. Corequisite: Courses in the Introductory Professional Term for the Secondary Education Route. Successful completion of the on-campus portion of the IPT is required prior to being granted permission to continue into EDFX 350.

**EDSE 369 Curriculum and Teaching for Secondary School ESL Minors**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★9 in the Minor subject area and successful completion of the Introductory Professional Term for the Secondary Education Route.

**EDSE 370 Curriculum and Teaching for Secondary School Second Language Minors**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: ★9 in the Minor subject area and successful completion of the Introductory Professional Term for the Secondary Education Route. Note: Not open to students whose Major is also a Second Language.

**EDSE 373 Curriculum and Teaching for Secondary School Social Studies Majors I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★9 in the Major subject area. Corequisite: Courses in the Introductory Professional Term for the Secondary Education Route. Successful completion of the on-campus portion of the IPT is required prior to being granted permission to continue into EDFX 350.

**EDSE 374 Curriculum and Teaching for Secondary School Social Studies Minors**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: ★9 in the Minor subject area and successful completion of the Introductory Professional Term for the Secondary Education Route. Note: Not open to students whose Major is Social Studies.

**EDSE 378 Curriculum and Teaching for Religious and Moral Education Minors**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★9 in the Minor subject area and successful completion of the Introductory Professional Term for the Secondary Education Route.

**EDSE 400 Conference Seminar**

★1-3 (*variable*) (either term, variable).

**EDSE 401 Conference Seminar**

★1-3 (*variable*) (either term, variable).

**EDSE 402 Guided Individual Study in Secondary Education**

★3 (*fi 6*) (either term, 3-0-0). May be offered over two terms. Prerequisites: consent of instructor and Department.

**EDSE 405 An Introduction to Curriculum Studies**

★3 (*fi 6*) (either term, 3-0-0). Intended as an introduction to the major discourses and themes that define the field of curriculum studies. It is focused in particular on the Albertan and Canadian contexts. EDSE 405 can be taken as an option by fourth year undergraduate students in the Bachelor of Education program.

**EDSE 412 Curriculum and Teaching in Secondary School Art Majors II**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: Introductory Professional Term and ★24 in the Major Subject area, and Curriculum and Teaching Course in Minor Subject Area. Corequisite: EDSE 451. Successful completion is required prior to being granted permission to commence EDFX 450.

**EDSE 417 Curriculum and Teaching for Secondary School Career and Technology Studies Majors II**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: Introductory Professional Term, ★24 in the Major subject and Curriculum and Teaching in the Minor Subject Area. Corequisite: EDSE 451. Successful completion is required prior to being granted permission to commence EDFX 450.

**EDSE 422 Curriculum and Teaching for Secondary School Drama Majors II**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: Introductory Professional Term, ★24 in the required Drama courses as specified in Education section of the Calendar under the heading Components of the Program and Curriculum and Teaching Course in Minor Subject Area. Corequisite: EDSE 451. Successful completion is required prior to being granted permission to commence EDFX 450.

**EDSE 424 Theory and Practice of Drama/Theatre in Education**

★3 (*fi 6*) (either term, 3-0-0). Designed to give students experience in the creation of shows which can tour schools for educational purposes. They will a) examine recent examples of Theatre in Education and Drama in Education experiences

and the theories upon which they are based; b) design their own shows which will be taken to schools; c) design workshops with the students; and d) create their own theory of Theatre in Education and Drama in Education. Emphasizes the use of drama as a learning medium, focusing on the curricular content and social issues experienced by students throughout their schooling. Prerequisite: Introductory Professional Term or DRAMA 249 or 259.

**EDSE 427 Curriculum and Teaching for Secondary School English Language Arts Majors II**

★3 (fi 6) (either term, 3-0-0). Prerequisites: Introductory Professional Term, ★24 in the Major subject area and Curriculum and Teaching Course in Minor Subject Area. Corequisite: EDSE 451. Successful completion is required prior to being granted permission to commence EDFX 450.

**EDSE 429 Teaching Print and Media Texts to Adolescents**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★12 in English.

**EDSE 430 Teaching Composition, Language and Culture to Adolescents**

★3 (fi 6) (either term, 3-0-0).

**EDSE 437 Curriculum and Teaching for Secondary School Mathematics Majors II**

★3 (fi 6) (either term, 3-0-0). Prerequisites: Introductory Professional Term, ★24 in the Major subject area, and Curriculum and Teaching Course in Minor Subject Area. Corequisite: EDSE 451. Successful completion is required prior to being granted permission to commence EDFX 450.

**EDSE 439 Specialized Methods in Secondary School Mathematics Teaching**

★3 (fi 6) (either term, 3-0-0). This course explores a range of particular methods relevant to the teaching of secondary school mathematics. Prerequisite: Introductory Professional Term or consent of the Department.

**EDSE 442 The Use of Computers in the Teaching and Learning of Mathematics**

★3 (fi 6) (either term, 3-0-1). This course explores the uses of technology in the teaching and learning of secondary school mathematics. Prerequisite: Introductory Professional Term or consent of the Department.

**EDSE 443 Curriculum and Teaching for Secondary School Music: Wind Band II**

★3 (fi 6) (second term, 3-0-0). Prerequisites: Introductory Professional term, ★24 in the Major subject area to include Music 211, 217 and 315, and Curriculum and Teaching Course in Minor Subject Area. Corequisite: EDSE 451. Successful completion is required prior to being granted permission to commence EDFX 450.

**EDSE 446 The School Jazz Program**

★3 (fi 6) (either term, variable). The School Jazz Program covers the essentials of running a school jazz band as a component of the secondary school instrumental program. Jazz improvisation, repertoire, rehearsal techniques, and jazz instrumental techniques are among the topics covered. Prerequisites: Students should have knowledge of functional harmony as taught in a typical first-year university harmony course.

**EDSE 447 Curriculum and Teaching for Secondary School Physical Education Majors II**

★3 (fi 6) (either term, 3-0-0). Prerequisites: Introductory Professional Term, ★24 in the Major subject area to include PEDS 294, and Curriculum and Teaching Course in Minor Subject Area. Corequisite: EDSE 451. Successful completion is required prior to being granted permission to commence EDFX 450.

**EDSE 451 Integrating Theory and Classroom Practice in the Advanced Professional Term**

★3 (fi 6) (either term, 3-0-0). Prerequisites: Introductory Professional Term, ★24 in the Major subject area, and Curriculum and Teaching Course in Minor Subject Area. Corequisite: Courses in the Advanced Professional Term for the Secondary Education Route including EDFX 450. Students may not receive credit for both EDFX 451 and EDSE 451.

**EDSE 452 Curriculum and Teaching for Secondary School Biological Sciences Majors II**

★3 (fi 6) (either term, 3-0-0). Prerequisites: Introductory Professional Term, ★24 in the Major subject area, Curriculum and Teaching Course in Minor Subject Area. Corequisite: EDSE 451. Successful completion is required prior to being granted permission to commence EDFX 450.

**EDSE 456 Curriculum and Teaching for Secondary School General Sciences Majors II**

★3 (fi 6) (either term, 3-0-0). Prerequisites: Introductory Professional Term, ★24 in the Major subject area, and Curriculum and Teaching Course in Minor Subject Area. Corequisite: EDSE 451. Successful completion is required prior to being granted permission to commence EDFX 450.

**EDSE 460 Curriculum and Teaching for Secondary School Physical Sciences Majors II**

★3 (fi 6) (either term, 3-0-0). Prerequisites: Introductory Professional Term, ★24 in Major subject area, and Curriculum and Teaching Course in Minor Subject

Area. Corequisite: EDSE 451. Successful completion is required prior to being granted permission to commence EDFX 450.

**EDSE 468 Curriculum and Teaching for Secondary School Second Language Majors II**

★3 (fi 6) (either term, 3-0-0). Prerequisites: Introductory Professional Term, ★24 in the Major subject area, and Curriculum and Teaching Course in Minor Subject Area. Corequisite: EDSE 451. Successful completion is required prior to being granted permission to commence EDFX 450.

**EDSE 473 Curriculum and Teaching for Secondary School Social Studies Majors II**

★3 (fi 6) (either term, 3-0-0). Prerequisites: Introductory Professional Term, ★24 in the Major subject area, and Curriculum and Teaching Course in Minor Subject Area. Corequisite: EDSE 451. Successful completion is required prior to being granted permission to commence EDFX 450.

**EDSE 478 Digital Technologies Integrated into the Curriculum**

★3 (fi 6) (either term, 3-0-0). This course will examine ways in which digital technologies can be used to support critical and reflective thinking. Students will develop applied and theory-based knowledge and skills in a variety of digital technologies.

**EDSE 495 Curriculum and Teaching in Secondary School Career Education**

★3 (fi 6) (either term, 3-0-0). Sections may be offered in an alternate delivery format at an increased rate of fee assessment; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**Graduate Courses**

**EDSE 500 Conference Seminar**

★3 (fi 6) (either term, variable). Selected topics in curriculum issues. Prerequisites: consent of Instructor and Department.

**EDSE 501 Conference Seminar**

★3 (fi 6) (either term, variable). Prerequisites: consent of Instructor and Department. May include alternate delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**EDSE 502 Advanced Level Guided Individual Study in Secondary Education**

★1-3 (variable) (either term, variable). May be offered over two terms. Prerequisites: consent of instructor and Department.

**EDSE 503 Curriculum Foundations**

★3 (fi 6) (first term, 3-0-0). This course focuses on the bases of current curriculum theories and their relationship to current educational practices. May contain alternative delivery sections; see 'Details of Courses' section.

**EDSE 504 Curriculum Inquiry**

★3 (fi 6) (second term, 3-0-0). This course focuses on curriculum perspectives and possibilities. Prerequisite: EDSE 503. May contain alternative delivery sections; see 'Details of Courses' section.

**EDSE 505 An Introduction to Curriculum Studies**

★3 (fi 6) (either term, 3-0-0). This course is intended as an introduction to the major discourses and themes that define the field of curriculum studies. It is primarily focused on the Albertan and Canadian contexts. EDSE 505 cannot be taken for credit if credit has already been received for EDSE 405 or EDSE 503.

**EDSE 508 Media and Popular Culture in the Curriculum**

★3 (fi 6) (either term, 0-3s-0). A seminar course examining texts and student reception of media (primarily television and film) within the rubric of popular culture for curriculum purposes.

**EDSE 509 Pedagogy of Desire**

★3 (fi 6) (either term, 0-3s-0). This course examines the sexual politics of the pedagogical relationship and is based on Lacanian psychoanalysis.

**EDSE 510 Research Methods in Secondary Education**

★3 (fi 6) (first term, 3-0-0). An introductory research methods and methodology course. The intent is to acquaint students with the many and varied methods of educational research, and the means of conducting research and presenting research findings. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**EDSE 511 Research Design in Secondary Education**

★3 (fi 6) (either term, 3-0-0). Designed to enable students to conceptualize and design a thesis proposal for their Master's degree. Prerequisite: EDSE 510 or consent of Department.

**EDSE 512 Research Project in Secondary Education**

★3 (fi 6) (either term, 3-0-0). Intended as a practical course to enable course-based students to conceptualize and design a research project for their Master's degree. Prerequisite: EDSE 510 or consent of Department. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.



**0 EDSE 529 Curricular Issues in English Language Arts Education**

★3 (*fi 6*) (either term, 0-3s-0). Through critically considering the relationship of current theory, research, and practice, this course will address a number of issues in the development and implementation of language arts programs at the secondary school level. It will also provide an overview of the key theories and influences which have shaped and are continuing to affect language arts curriculum and instruction.

**0 EDSE 530 Teaching Language and Writing to Adolescents in a Multimedia World**

★3 (*fi 6*) (either term, 0-3s-0). This course develops an understanding of writing, composition theory, and writing instruction through involvement in the process, discussion of classroom practices, and critical examination of research and theory. The seminar will examine key aspects of composing processes, students' development as writers, curriculum, research, and evaluation. Students in this course will be expected to share their writing regularly as well as examine pedagogical and curricular concerns.

**0 EDSE 539 Secondary Mathematics Education: Research Issues in the Teaching and Learning of Mathematics**

★3 (*fi 6*) (either term, 3-0-0). Explores a range of research and issues concerned with the teaching and learning of mathematics. Possible topics include: mathematical understanding, communication, spoken and written discourse, and varied classroom practices.

**0 EDSE 540 Secondary Mathematics Education: Examining Tasks, Curricula and Programs**

★3 (*fi 6*) (either term, 3-0-0). Examines mathematical tasks, curricula and programs and explores the relationships among them and their implications for mathematics education policy.

**0 EDSE 546 The School Jazz Program**

★3 (*fi 6*) (either term, variable). The School Jazz Program covers the essentials of running a school jazz band as a component of the secondary school instrumental program. Jazz improvisation, repertoire, rehearsal techniques and jazz instrumental techniques are among the topics covered. Prerequisites: Students should have knowledge of functional harmony as taught in a typical first-year university harmony course.

**EDSE 548 Conceptualizing the Field of Physical Education: Historical and Contemporary Issues**

★3 (*fi 6*) (either term, 3-0-0). An introduction to theory and research in the field of physical education.

**0 EDSE 566 Philosophy of Science: Implications for Teaching**

★3 (*fi 6*) (either term, 0-3s-0). Addresses both epistemology and philosophy of science in relation to classroom science education. Students are introduced to major perspectives in contemporary philosophy of science. They critically examine and reflect on how such perspectives relate to the practices of science teaching.

**0 EDSE 567 Science, Technology, Society and Environment: Implications for Teaching**

★3 (*fi 6*) (either term, 0-3s-0). Addresses the natures of science and of technology, and their interactions with one another and with social issues. The role of science and technology in modern Western society as examined, and issues of environmental responsibility, bioethics, alternative cultural beliefs about science and society, and the implications of science, technology, society and environment (STSE) for classroom science teaching are explored.

**0 EDSE 568A Critical Examination of Historical and Integrated Approaches to Teaching Second and Foreign Language Instruction**

★3 (*fi 6*) (either term, 0-3s-0). Students will critically examine approaches to second and foreign language instruction such as grammar-translation, direct method, audio-lingual, functional-notional, communicative and the informed eclectic. Educational ideas that influence each approach will be discussed.

**0 EDSE 569 Issues and Approaches in Second and Foreign Language Literacy Development**

★3 (*fi 6*) (either term, 0-3s-0). Students will examine issues unique to second and foreign language students as they learn to read. From the beginning reader to the advanced, explorations will draw from upon top-down, bottom-up and interactional views of literacy as well as socio-political factors.

**EDSE 577 Pedagogy of Technology: Teachers and Students as Cyborgs**

★3 (*fi 6*) (either term, 3-0-0). A seminar course examining the pedagogical and curricular implications of the technologizing of personal and educational lifeworlds.

**0 EDSE 578 Digital Technologies Integrated into the Curriculum**

★3 (*fi 6*) (either term, 3-0-0). This course will examine ways in which digital technologies can be used to support critical and reflective thinking. Students will develop applied and theory-based knowledge and skills in a variety of digital technologies.

**0 EDSE 579 Integrating Technology into the Classroom: A Research Project**

★3 (*fi 6*) (either term, 0-3s-0). Students will develop and implement an information and communication technology research project. Students focus on

technology activities that may lead to gains in learning and/or lead to changes in teaching and learning. Prerequisite: EDSE 578 or consent of the Department and the student must be in a position to implement technology activities in an educational setting.

**0 EDSE 580 Curriculum and Teaching for Religious and Moral Education**

★3 (*fi 6*) (either term, 3-0-0).

**0 EDSE 601 Conference Seminar in Secondary Education II**

★1-3 (*variable*) (variable, variable). Prerequisites: consent of instructor and Department. May include alternate delivery sections, refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**EDSE 602 Advanced Level Guided Individual Study in Secondary Education**

★1-3 (*variable*) (either term, variable). Prerequisites: consent of Instructor and Department.

**0 EDSE 606 Theory and Practice in Action Research**

★3 (*fi 6*) (first term, 3-0-0). Prerequisites: EDSE 503 and 504 or consent of Department.

**0 EDSE 607 Action Research Practicum**

★3 (*fi 6*) (second term, 3-0-0). Prerequisites: EDSE 503, 504, and 606 or consent of Department.

**0 EDSE 610 Advanced Research Seminar in Secondary Education I**

★3 (*fi 6*) (either term, 0-3s-0). A doctoral-level research seminar that deals with selected topics and addresses all stages of the research process. Prerequisite: consent of Department.

**EDSE 611 Phenomenological Research and Writing**

★6 (*fi 12*) (two term, 0-3s-0). This research seminar explores human science methodology and focuses on hermeneutic phenomenology. The course investigates and develops descriptive, interpretive, vocative, and ethical dimensions of reflective writing. The meaning of any possible human experience can be a topic for phenomenological inquiry. This course is especially relevant to persons interested in the study of phenomenological meaning in the domains of education, psychology, counselling, the health sciences, and related professional and academic fields.

**EDSE 612 Theory and Practice of Arts Based Educational Research**

★3 (*fi 6*) (either term, 3-0-0). Qualitative research data can be collected, analyzed and disseminated in a variety of ways. Using current theories in qualitative research and creative activities from art, music, dance and drama, participants actively and creatively examine how to employ arts approaches in all phases of their research. Prerequisite: EDSE 510 or consent of Instructor and Department. Students may not receive credit in both EDSE 513 and 612.

**EDSE 620 Advanced Research Seminar in Secondary Education II**

★3 (*fi 6*) (either term, 0-3s-0). A doctoral-level research seminar that deals with selected topics and addresses all stages of the research process. This course is a continuation of EDSE 610. Prerequisites: EDSE 610 and consent of Department.

**0 EDSE 630 Perspectives on English Language Arts Learning and Teaching**

★3 (*fi 6*) (either term, 0-3s-0). This course will provide an in-depth critical examination of the theory and research associated with selected topics in English language arts curriculum and instruction. Topics of historical and current relevance will be explored, such as emerging definitions of the field of English language arts education, English curriculum and teaching models, and approaches to evaluation. Students will examine landmark research studies in English language arts education to learn more about appropriate research approaches for different types of studies, as well as consider the ideas presented through the studies. Prerequisites: EDSE 529, 530, 629, or consent of Instructor.

**EDSE 669 Curriculum and Resource Development in Second Languages**

★3 (*fi 6*) (either term, 0-3s-0). Students will address issues of philosophy, rationale, learner expectations, unit organization, learner needs, and linguistic, strategic and cultural competence in resource analysis and development. As well, evaluation of resources will be included.

**EDSE 670 Postcolonial Perspectives, Theories and Curriculum**

★3 (*fi 6*) (either term, 3-0-0). Students consider key concepts and reading practices in postcolonial studies and explore their relationship to and significance for teaching, learning, and curriculum.

**EDSE 900 Directed Research Project**

★3 (*fi 6*) (either term, unassigned).

## 231.116 Education - Stage, EDU S

Faculté Saint-Jean

**Note:** Des frais de placement seront exigés pour les cours suivants. Veuillez consulter \$22.2.1 pour de plus amples détails.

## Cours de 1er cycle

### EDU S 350 Stage de formation sur la diversité

★3 (fi 6) (l'un ou l'autre semestre, variable). Ce stage offre aux étudiants l'occasion d'améliorer leur compréhension des enjeux liés à la diversité culturelle dans le cadre d'une expérience de vie (ou d'un séjour) en milieu communautaire soit en Alberta, soit à l'étranger. Préalable : EDU M 498.

### EDU S 420 Enseignement pratique: niveau élémentaire

★6 (fi 12) (l'un ou l'autre semestre, 7 semaines). Stage pratique de 7 semaines dans un milieu scolaire (immersion française ou français en milieu minoritaire) à partir de la rentrée scolaire. Préalable: EDU E 231 ou l'équivalent. Note(s): Ce cours occasionne des frais additionnels (voir 22.2.3). Ce cours n'est pas accessible aux étudiants ayant des crédits pour ENPRQ 300. Dates limites pour les inscriptions : 15 mai pour la session d'automne et 1er décembre pour la session d'hiver.

### EDU S 421 Enseignement pratique: niveau élémentaire

★6 (fi 12) (l'un ou l'autre semestre, 7 semaines). (Semestre d'hiver) Stage pratique de 7 semaines dans un milieu scolaire (immersion française ou français en milieu minoritaire). Préalable(s): EDU S 420 Note(s): Ce cours occasionne des frais additionnels (voir §22.2.3). Ce cours n'est pas accessible aux étudiants ayant des crédits pour ENPRQ 350. Dates limites pour les inscriptions : 15 mai pour la session d'automne et 1er décembre pour la session d'hiver.

### EDU S 470 Enseignement pratique: niveau secondaire

★6 (fi 12) (l'un ou l'autre semestre, 7 semaines). Stage pratique de 7 semaines dans un milieu scolaire (immersion française ou français en milieu minoritaire) à partir de la rentrée scolaire. Préalable(s): EDU E 231. Note(s) Ce cours occasionne des frais additionnels (voir §22.2.3). Ce cours n'est pas accessible aux étudiants ayant des crédits pour ENPRQ 310. Dates limites pour les inscriptions : 15 mai pour la session d'automne et 1er décembre pour la session d'hiver.

### EDU S 471 Enseignement pratique: niveau secondaire

★6 (fi 12) (l'un ou l'autre semestre, 7 semaines). Stage pratique de 7 semaines dans un milieu scolaire (immersion française ou français en milieu minoritaire). Préalable(s): EDU S 470. Note: Ce cours occasionne des frais additionnels (voir §22.2.3). Ce cours n'est pas accessible aux étudiants ayant des crédits pour ENPRQ 360. Dates limites pour les inscriptions : 15 mai pour la session d'automne et 1er décembre pour la session d'hiver.

## 231.117 Electrical and Computer Engineering, ECE

Department of Electrical and Computer Engineering  
Faculty of Engineering

### Undergraduate Courses

#### ECE 200 Technical Communication in Computer and Electrical Engineering

★2 (fi 4) (either term, 2-0-0). Description of the areas of study in electrical and computer engineering and the related industry in Alberta, including coverage of elements of ethics, equity, concepts of sustainable development and environmental stewardship, public and worker safety and health considerations including the context of the Alberta Occupational Health and Safety Act. Introduction to technical communications in the electrical engineering discipline. Concepts of effective written and oral technical communication, both individual and team delivered; audience identification, planning and research, drafting prose elements and creating persuasive visual graphics. Case studies based on presentations by invited industrial speakers. Student oral presentations.

### Graduate Courses

#### ECE 502 Probability and Random Processes for Electrical Engineers

★3 (fi 6) (either term, 3-0-0). Review of probability theory, random variables, probability distribution and density functions, characteristic functions, convergence of random sequences, and laws of large numbers. Analysis of random processes, including stationarity, ergodicity, autocorrelation functions power spectral density, and transformation of random processes through linear systems. Application to communication systems.

#### ECE 510 Computer System Architecture

★3 (fi 6) (either term, 3-0-0). Evolution of computer architecture and factors influencing the design of hardware and software elements of computer systems. Instruction set design; processor micro-architecture and pipelining; cache and virtual memory organizations; protection and sharing; I/O architectures; VLIW machines; vector supercomputers; multithreaded architectures; symmetric multiprocessors, DSP processors, and other parallel computers.

#### ECE 511 Digital ASIC Design

★4.5 (fi 6) (either term, 3-0-3). Design of digital application-specific integrated circuits (ASICs) using synthesis CAD tools. Topics include design flow, hierarchical design, hardware description languages such as VHDL, synthesis, design verification,

IC test, chip-scale synchronous design, field programmable gate arrays, mask programmable gate arrays, CMOS circuits and IC process technology. For the project, students will design and implement a significant digital system using field programmable gate arrays. Note: Only one of the following courses may be taken for credit: ECE 511 or E E 552.

#### ECE 512 Digital System Testing and Design for Testability

★3 (fi 6) (either term, 3-0-0). Designing and testing digital VLSI/ULSI systems. Reliability issues of digital systems, testing algorithms, design-for-testability strategies. Fault modelling, fault simulation, automatic test generation, data compaction, and pseudorandom techniques. Design for testability (DFT), scan test, built-in self-test, boundary scan. Memory testing, error control code. DFT CAD tools. Note: Only one of the following courses may be take for credit: ECE 512 or E E 651.

#### ECE 521 Software Requirements Engineering and Software Design

★3.8 (fi 6) (either term, 3-0-3/2). Understanding needs of software-intensive systems. Converting the statement of needs into complete and unambiguous description of the requirements. Techniques for elicitation, analysis, and specification of requirements. Mapping of requirements into a description of their implementation. Software design techniques for capturing and expressing a different view of the system. Elements of architectural design, abstract specification, interface design, data structure and algorithm design.

#### ECE 522 Software Construction, Verification and Evolution

★3.8 (fi 6) (either term, 3-0-3/2). Construction of software components identified and described in design documents. Translation of a design into an implementation language. Program coding styles. Concepts, methods, processes, and techniques supporting the ability of a software system to change, evolve, and survive. Verification of software ensuring fulfillment of the requirements. Validation of software products at different stages of development: unit testing, integration testing, system testing, performance testing, and acceptance testing.

#### ECE 523 Software Project Management and Software Quality

★3.8 (fi 6) (either term, 3-0-3/2). Methods and techniques for defining project objectives, assessing project needs and resources, developing estimates for the work to be performed, establishing the necessary commitments, and defining the plan for the work. Technical aspects of the software development process: activities, practices, and transformations used to develop and maintain software. The concepts, methods, and techniques for managing risks. The procedures and standards for producing high-quality software products. Quality planning and control. Verification and validation activities. Measurement of product and process attributes.

#### ECE 530 Power Quality

★3 (fi 6) (either term, 3-0-0). Introduction to power quality. Definition and characteristics of power system disturbances. Generation, characterization, mitigation and analysis of key power quality disturbances: harmonics, voltage sags and swells, and electromagnetic transients. Case studies using transients and harmonics programs. Application of power quality standards and practical aspects of power quality assessment; custom power technologies and current developments. Note: May not be taken for credit if credit has already been obtained in either E E 529 or E E 627.

#### ECE 541 Digital Signal Processing

★3 (fi 6) (either term, 3-0-0). Discrete-time signals and systems, Discrete Fourier Transform, Fast Fourier Transform, Fourier analysis, short-time Fourier transform, wavelet transform. Digital filters, optimal filter design, polyphase filterbanks, subband analysis. Random signal analysis, Karhunen-Loève expansion, power spectrum estimation, autoregressive models.

#### ECE 551 Design of CMOS Analog Integrated Circuits

★3 (fi 6) (either term, 3-0-0). MOS devices and modelling. Processing and layout. CMOS design rules. Basic current mirrors and single-stage amplifiers. High-output impedance current mirrors. MOS differential pair and gain stage. Basic opamp design and compensation. Two-stage CMOS opamp. Feedback and opamp compensation. Advanced current mirrors and opamps. Folded-cascode opamp. Current-mirror opamp. Fully differential opamps. Common-mode feedback circuits. Switched-capacitor circuits. Basic building blocks. Basic operation and analysis. First-order filters. Biquad filters. Continuous-time filters. CMOS transconductors. MOSFET-C filters. Noise analysis. Note: Only one of the following courses may be taken for credit: ECE 551 or E E 633.

#### ECE 553 Digital Integrated Circuit Design

★3.8 (fi 6) (either term, 3-0-3/2). Review of semiconductor materials, integrated circuit processing, and basic design flows using CAD tools. Electrical characteristics of interconnect, passive elements, diodes, MOSFETs and logic gates. Sequential elements, memory and datapath circuits. Pad design. Chip-level design including power and clock distribution. Scaling theory. Testing and design for testability. Emerging technologies. Note: Only one of the following courses may be taken for credit: ECE 553 or E E 483 or 653.

#### ECE 558 Microfabrication and Nanofabrication Topics I

★3 (fi 6) (either term, 3-0-0). Vacuum principles: gas kinetics and flow, pumping speed theory, pumping methods, pressure, measurement, sorption processes, vacuum system design basics. Thin film growth by sputtering, evaporation and

chemical techniques. Characterization and classification of optical, electrical and mechanical properties. Applications of thin films. Note: May not be taken for credit if credit has already been obtained in either E E 641 or 642.

#### **ECE 559 Microfabrication and Nanofabrication Topics II**

★3 (fi 6) (either term, 3-0-0). The VLSI fabrication process for microelectronics and MEMs applications. Overview of processing steps: silicon wafer material, oxidation, lithography, diffusion and ion implantation, chemical vapor deposition, metallization. Process model. Yield, packaging, and assembly. Note: Only one of the following courses may be taken for credit: ECE 559 or E E 619.

#### **ECE 560 Modern Control Theory**

★3 (fi 6) (either term, 3-0-0). Linear vector spaces. Basis, subspaces, review of matrix theory. State space realizations of linear time-invariant systems. Controllability and observability. Observers. State feedback. The separation principle. Quadratic optimal control. Note: Only one of the following courses may be taken for credit: ECE 560 or E E 660.

#### **ECE 561 Nonlinear Control Systems**

★3 (fi 6) (either term, 3-0-0). Nonlinear system examples. Stability in the sense of Lyapunov. Lyapunov functions. The invariance principle. Lyapunov-based design. Backstepping. Input-output stability. Passivity and small-gain theorems. Input to state stability. Dissipativity. Note: Only one of the following courses may be taken for credit: ECE 561 or E E 666.

#### **ECE 570 Computational Electromagnetics**

★3 (fi 6) (either term, 3-0-0). Review of techniques and applications in computational electromagnetics. Finite-Difference Time-Domain solution of Maxwell's equations: boundary conditions, numerical stability, numerical dispersion, near-to-far field transformation. Introduction to Finite-Elements Technique: basis and weighting functions, Galerkin's method, nodal and edge elements, variational formulation, applications. Introduction to the Method of Moments: integral formulation of electrostatics, Green's function, point matching and Galerkin's method, treatment of open regions.

#### **ECE 571 Optical and Quantum Electronics**

★3 (fi 6) (either term, 3-0-0). Optical resonators. Interaction of radiation and atomic systems. Fabry-Perot lasers, specific laser systems. Modelocked and Q-switched lasers. Second-harmonic generation and parametric oscillation, electro-optic modulation of laser beams. Interaction of light with sound. Semiconductor lasers: theory and applications. Ultrafast lasers and phenomena.

#### **ECE 582 Information Theory and Channel Coding**

★3 (fi 6) (either term, 3-0-0). Information theory as applied to digital signals. Source coding. The channel coding theorem, linear error control codes, and algebraic error correction coding. Concatenation of codes and iterative decoding.

#### **ECE 583 Digital Communications**

★3 (fi 6) (either term, 3-0-0). Analysis and design of digital communication systems based on probability theory, signal space representation and optimum detection principles. Modulation techniques and their performance in AWGN and dispersive channels. Channel equalization, carrier and symbol synchronization. Note: Only one of the following courses may be taken for credit: ECE 583 or E E 656.

#### **ECE 601 MSc Research Project Definition**

★2.5 (fi 5) (second term, 0-1s-0). Basics of how to prepare a good research proposal. Preparation of a report defining the proposed MSc thesis research. Presentations by MSc students on their thesis research proposal.

#### **ECE 602 PhD Research Project Definition**

★2.5 (fi 5) (second term, 0-1s-0). Basics of how to prepare a good research proposal. Preparation of a report defining the proposed PhD thesis research. Presentations by PhD students on their thesis research proposal.

#### **ECE 612 Semiconductor Memory Circuits and Architectures**

★3 (fi 6) (either term, 3-0-0). Memory circuits and architectures of several families of semiconductor memories, with emphasis on DRAM. Topics include SRAM, DRAM, flash, ferroelectric memories, sensing, decoding speed-area-power trade-offs, redundancy, interfaces and novel applications. Focused literature review and a design project. Note: Only one of the following courses may be taken for credit: ECE 612 or E E 652.

#### **ECE 613 VLSI CAD Algorithms**

★3 (fi 6) (either term, 3-0-0). Design of algorithms for VLSI CAD tools. Review of algorithmic graph theory, optimization methods and computational complexity; algorithms for layout compaction, placement and partitioning, routing, simulation, logic synthesis, and verification.

#### **ECE 614 SIMD Parallel Processor Architectures and Applications**

★3 (fi 6) (either term, 3-0-0). Single Instruction stream, Multiple Data stream (SIMD) parallel processor architectures and their applications. Course work includes a focused literature review and a parallel programming project. Note: Only one of the following courses may be taken for credit: ECE 614 or E E 654.

#### **ECE 621 Software Technology Evaluation**

★3.8 (fi 6) (either term, 3-0-3/2). Introduction to mechanisms for comparing and evaluating various software artifacts and procedures. Quantitative comparison, based upon scientific practice and discipline, of such objects as: software engineering

techniques, processes, methods, tools and systems. Provides a solid basis for comparing new research against the existing state of the art.

#### **ECE 624 Fuzzy Sets in Human-Centric Systems**

★3 (fi 6) (either term, 3-0-0). Developments in human-centric systems. Fuzzy sets and information granulation. Computing with fuzzy sets: logic operators, mapping, fuzzy relational calculus. Fuzzy models and rule-based models. Fuzzy neural networks. Fuzzy clustering and unsupervised learning.

#### **ECE 625 Advanced Data Analysis and Decision Making**

★3 (fi 6) (either term, 3-1s-0). Approaches, techniques and tools for decision-making processes. Human decision making, decision support and expert systems. Information retrieval, modern data mining methods: SQL, OLAP, clustering, association rules, rule and decision tree learning. Bayesian classification, Bayesian belief networks, support vector machines, and ensemble learning.

#### **ECE 630 Circuit Design Techniques for Power Electronics**

★3 (fi 6) (either term, 3-0-0). Introduction to power semiconductors, switchmode power supplies, MOSFET and IGBTs, current and voltage sensing, pulse width modulation control, printed circuit board design software. Design project.

#### **ECE 631 Simulation Techniques for Power Electronics**

★3 (fi 6) (either term, 3-0-0). Introduction to simulation tools, transient analysis, power semiconductor models, circuit elements for electric drives, functional simulation of switchmode power supplies, control techniques. Simulation project.

#### **ECE 632 Electromagnetic Modeling of Electromechanical Systems**

★3 (fi 6) (either term, 3-0-0). Electromagnetics in electromechanical devices. Traditional electromagnetic models. Finite element analysis applied to magnetostatic, frequency and time domains. Consideration of linear and non-linear materials. Solution of non-linear models using Newton-Raphson equations. Motion.

#### **ECE 633 Modeling and Simulation of Electromagnetic Transients in Electrical Circuits**

★3 (fi 6) (either term, 3-0-0). Electromagnetic transients. Modeling basic elements, transmission lines and power electronic apparatus. Real time transient simulation including FACTS and HVDC.

#### **ECE 634 Design of Reliable Industrial and Commercial Power Systems**

★3 (fi 6) (either term, 3-0-0). Fundamentals of reliability analysis as it applies to planning and design of industrial and commercial electric power distribution systems. Cost of power outage analysis, economic evaluation of reliability. Reliability compliance and reliability demonstration for electronic and electrical equipment and systems. Design of emergency and standby systems. Design and reliability analysis of radial primary and secondary selective distribution systems. Preventive maintenance. Note: Only one of the following courses may be taken for credit: ECE 634 or E E 528.

#### **ECE 643 Multimedia Signal Processing**

★3 (fi 6) (either term, 3-0-0). History of multimedia systems, multimedia authoring. Digital audio and color representation. Text, audio, and image compression, television fundamentals, digital video compression and streaming principles, high definition TV standard, audio, image and video processing techniques. Corequisite: ECE 541 or consent of Instructor. Note: Only one of the following courses may be taken for credit: ECE 643 or E E 587.

#### **ECE 644 Digital Image and Video Processing**

★3 (fi 6) (either term, 3-0-0). Sampling and Quantization. Digital transforms for multimedia signal processing: DFT, DCT, DST, K-L transform, principal component analysis, subband analysis, wavelet and multi-resolution representation. Image processing: histogram processing, image filtering and enhancement, halftone and dithering for binary image processing, color transforms, color image processing. Video processing: basic video models, spatial-temporal processing of video, morphing and wipe detection, video segmentation and content analysis. Applications: medical imaging, satellite imaging, seismology.

#### **ECE 645 Multirate Digital Signal Processing Systems and Filterbanks**

★3 (fi 6) (either term, 3-0-0). Discrete-time signals and systems, discrete-time transforms, FIR and IIR digital filters. Fundamentals of multirate systems and filterbanks, polyphase decomposition, efficient decimation and interpolation, DFT filterbanks, aliasing and imaging distortions, Nyquist filters. Maximally decimated filterbanks, QMF filterbanks and perfect reconstruction. DCT and DST transforms, perfect reconstruction cosine modulated filterbanks. Short term Fourier transform, wavelet transform, continuous-time and discrete-time orthonormal wavelet basis functions, filterbank analog.

#### **ECE 651 Design of CMOS Radio-Frequency Integrated Circuits**

★3 (fi 6) (either term, 3-0-0). Passive RC-components in CMOS microelectronics; high-frequency amplifier design; LNA design. Mixers. RF power amplifier. Phase-locked loops; oscillators and synthesizers: Phase noise. Transmitters and receivers; transceivers in the frequency domain; performance of transceivers; high level synthesis. Note: Only one of the following courses may be taken for credit: ECE 651 or E E 671.

#### **ECE 658 Fabrication and characterization of Microelectromechanical Systems**

★3 (fi 6) (either term, 3-0-0). Fabrication and characterization of MEMs devices:



state-of-the-art technologies for RF, electronic, optical, and fluidic MEMs devices. MEMs devices: sensors, actuators, resonant structures, optical switches and filters, microfluidics for chemical and biological sensing, analysis and manipulation.

#### **ECE 659 Applications of Nanotechnology**

★3 (fi 6) (either term, 3-0-0). Quantum, nanophotonic, nanoelectronic and nanobiotechnological devices. Fabrication techniques for devices: self-assembly, organic and hybrid materials and devices, lithographic technologies. Applications of nanotechnology devices in computing, human health, telecommunications.

#### **ECE 662 Sampled Data Control Systems**

★3 (fi 6) (either term, 3-0-0). Analysis and design of sampled data control systems. Basic concepts of linear discrete-time systems. Norms of signals and systems. State-space models. Discretization of analog systems. Internal stability and stabilization. Parameterization of all stabilizing controllers. H-2 and H-infinity optimal control. Digital design by fast discretization. Direct digital design. Note: Only one of the following courses may be taken for credit: ECE 662 or E E 662.

#### **ECE 664 Nonlinear Control Design with Applications**

★3 (fi 6) (either term, 3-0-0). Model based design methods for systems described by nonlinear differential equations. Exact error linearization for nonlinear observer design. Approximate linearization methods. Adaptive linearization for robustness. Differential flatness. Trajectory planning.

#### **ECE 671 Nonlinear Optics and Nanophotonics**

★3 (fi 6) (either term, 3-0-0). Fundamental description of nonlinear optical phenomena in terms of higher order susceptibilities. Various specific nonlinear phenomena: electrooptic modulation, acoustooptic modulation, harmonic generation and frequency conversion, stimulated Raman and Brillouin scattering and amplification, parametric oscillation and amplification, self phase modulation, soliton propagation, and photorefractive effects. Nanocomposites, quantum well and quantum dot devices, photonic bandgap crystals. Applications to engineering laser and fiber optic communication systems. Note: Only one of the following courses may be taken for credit: ECE 671 or E E 684.

#### **ECE 673 Laser Applications**

★3 (fi 6) (either term, 3-0-0). Laser systems and beam optics. Fundamentals of laser materials interaction including laser absorption, energy transport and laser ablation mechanisms. Laser applications in microscale engineering, nanoscale engineering, photonics, science and medical science. Note: Only one of the following courses may be taken for credit: ECE 673 or E E 645.

#### **ECE 674 Radio Astronomy Techniques**

★3 (fi 6) (either term, 3-0-0). Radiometry; galactic background and sources; antennas and arrays as spatial frequency filters; aperture synthesis; earth-rotation synthesis; interferometry; correlation receivers. Note: Only one of the following courses may be taken for credit: ECE 674 or E E 628.

#### **ECE 675 Plasma Engineering**

★3 (fi 6) (either term, 3-0-0). Engineering of plasmas for applications in fusion, space, astrophysics, microelectronic processing, plasma-assisted manufacturing and microwave generation. Characterization of the plasma state, charged particle dynamics in electric and magnetic fields, the two-fluid model, magnetohydrodynamic model, linear and nonlinear waves, atomic and collisional processes, transport properties.

#### **ECE 681 Survivable Networks**

★3 (fi 6) (either term, 3-0-0). History concepts, theories, and technologies of high speed restoration of the backbone telecommunications transport network. Unavailability, network reliability, survivability, impact of failures, k-shortest paths rerouting, max flow, distributed restoration, selfhealing network protocol, optimal capacity allocation, path vs span restoration, selfhealing rings, matched nodes, uni- and bi-directional rings, optimal ring design problem, dual feeding, diverse path pairs. Current research topics: preconnection, node recovery, distributed preplanning, self-traffic engineering, hybrid networks. Student projects and seminars. Note: Only one of the following courses may be taken for credit: ECE 681 or E E 681.

#### **ECE 682 Error Control Coding**

★3 (fi 6) (either term, 3-0-0). Advanced state-of-the art algorithmic channel coding and decoding for reliable digital data communications over noisy communications channels. Channel capacity and performance bounds. Trellis coding and trellis coded modulation. Concatenated coding, turbo codes. Turbo coded modulation. Prerequisites: ECE 502 and 582.

#### **ECE 683 Broadband Digital Communications**

★3 (fi 6) (either term, 3-0-0). Direct sequence and frequency hopping spread spectrum techniques, and code division multiple access (CDMA). Orthogonal frequency division multiplexing and multicarrier CDMA. Capacity of multiple-input multiple-output systems, space-time coding, and space-time layering. Principles of multi-user detection with optimum and sub-optimum approaches. Selected industry standards. Prerequisites: ECE 502, 582, and 583.

#### **ECE 684 Wireless Communication Systems**

★3 (fi 6) (either term, 3-0-0). Cellular system design fundamentals, propagation in mobile radio channels: large and small scale effects, modulation techniques for mobile radio, diversity and diversity combining techniques, multiple access techniques. Prerequisites: ECE 502 and 583.

#### **ECE 685 Photonic Devices for Communications**

★3 (fi 6) (either term, 3-0-0). Overview of integrated photonic devices for information and communications applications. Light-matter interactions in waveguides: material response and dispersion, absorption and emission. Guided waves in structured media: modal theory, loss and gain mechanisms in guided modes. Coupled-mode theory and application to basic guided-wave devices. Active control of light by electrical and optical control signals. Switching, modulation, and bistable devices. Photonic crystals and selected topics. Note: Only one of the following courses may be taken for credit: ECE 685 or E E 682.

#### **ECE 710 Advanced Topics in Computer Engineering**

★3 (fi 6) (either term, 3-0-0).

#### **ECE 720 Advanced Topics in Software Engineering**

★3 (fi 6) (either term, 3-0-0).

#### **ECE 730 Advanced Topics in Power Engineering**

★3 (fi 6) (either term, 3-0-0).

#### **ECE 740 Advanced Topics in Digital Signal Processing**

★3 (fi 6) (either term, 3-0-0).

#### **ECE 750 Advanced Topics in Micro- and NanoSystems**

★3 (fi 6) (either term, 3-0-0).

#### **ECE 760 Advanced Topics in Control**

★3 (fi 6) (either term, 3-0-0).

#### **ECE 770 Advanced Topics in Electromagnetics**

★3 (fi 6) (either term, 3-0-0).

#### **ECE 780 Advanced Topics in Communications**

★3 (fi 6) (either term, 3-0-0).

#### **ECE 790 Advanced Topics in Biomedical Engineering**

★3 (fi 6) (either term, 3-0-0).

#### **ECE 900 Directed Research Project**

★6 (fi 12) (variable, unassigned).

#### **ECE 910 Directed Research Project**

★3 (fi 6) (variable, unassigned).

## 231.118 Electrical and Computer Engineering/Biomedical Eng, EE BE

Departments of Electrical and Computer Engineering/Biomedical Engineering  
Faculties of Engineering; and Medicine and Dentistry

### Undergraduate Courses

#### **EE BE 512 Biophysical Measurement and Instrumentation**

★3 (fi 6) (first term, 3-0-0). An introduction to the principles that underlie biophysical instrumentation. Various biomedical sensors are examined and their application to the measurement of blood pressure, cardiac output, and respiratory parameters discussed. The origin of biopotentials is developed and extended to the membrane and action potentials. The measurement of bioelectrical signals such as the ECG and EMG is presented. Applications of electrodes, biochemical sensors, and lasers are examined. Biostimulation, including cardiac pacemakers, defibrillators, and functional neuromuscular stimulation are introduced. Prerequisite: consent of Department of Biomedical Engineering or Department of Electrical and Computer Engineering.

#### **EE BE 540 Digital Computer Processing of Images**

★3 (fi 6) (either term, 3-0-3/2). Extension of sampling theory and the Fourier transform to two dimensions, pixel operations including gray-level modification, algebraic and geometric transformations. The design of spatial filters for noise reduction, image sharpening and edge enhancement, and some discussion of interpolation techniques. An introduction to the concepts of image restoration from known degradations and the reconstruction of images from parallel and fan projections. Prerequisite: E E 338 or consent of Instructor.

## 231.119 Electrical Engineering, E E

Department of Electrical and Computer Engineering  
Faculty of Engineering

### Undergraduate Courses

#### **E E 215 Fundamentals of Electrical Engineering**

★3.8 (fi 6) (either term, 3-0-3/2). Fundamentals of Electricity: conductors, insulators. Theory and design of electrical components: resistors, capacitors and inductors.

Energy storage in magnetic and electric fields. Principles of electrical energy transfer and its application in transformers, motors and generators. Prerequisite: PHYS 130. Corequisite: MATH 101 or equivalent.

#### **E E 231 Numerical Analysis for Electrical and Computer Engineers**

★3.8 (fi 6) (either term or Spring/Summer, 3-0-3/2). The analysis of various numerical techniques for solving Electrical and Computer Engineering problems. Topics include numerical integration, differentiation, numerical solution of ordinary differential equations (ODEs), finding roots of nonlinear equations, the solution of linear systems of equations and the solution of optimization problems. Consideration of the sources of error in numerical computation. Prerequisites: E E 240, MATH 101, MATH 102. Corequisite: MATH 201.

#### **E E 238 Continuous Time Signals and Systems**

★3.5 (fi 6) (either term, 3-1s-0). Introduction to linear systems and signal classification. Delta function and convolution. Fourier series expansion. Fourier transform and its properties. Laplace transform. Analysis of linear time invariant (LTI) systems using the Laplace transform. Prerequisites: E E 240, MATH 102 and 201.

#### **E E 239 Fundamentals of Electrical Engineering**

★3.8 (fi 6) (either term or Spring/Summer, 3-0-3/2). Physical concepts of passive circuit elements, Kirchhoff's laws and DC circuit equations. Energy concepts, time domain analysis of AC circuits. Impedance, complex numbers and phasor algebra. AC power concepts, resonance, three phase circuits, introduction to machines.

#### **E E 240 Electrical Circuits I**

★4.3 (fi 6) (first term, 3-1s-3/2). Circuit element definitions. Circuit laws: Ohm's, KVL, KCL. Resistive voltage and current dividers. Basic loop and nodal analysis. Dependent sources. Circuit theorems: linearity, superposition, maximum power transfer, Thevenin, Norton. Time domain behavior of inductance and capacitance, energy storage. Sinusoidal signals, complex numbers, phasor and impedance concepts. Magnetically coupled networks. Single phase power and power factor. Prerequisites: MATH 101, 102.

#### **E E 250 Electrical Circuits II**

★4.3 (fi 6) (second term or Spring/Summer, 3-1s-3/2). Nonlinear circuit analysis. Diodes: ideal and simple models, single phase rectifiers. Ideal and finite gain op-amps. Treatment of RLC circuits in the time domain, frequency domain and s-plane. Two port networks. Prerequisites: E E 240, MATH 102 and 201. Corequisite: E E 238.

#### **E E 280 Introduction to Digital Logic Design**

★3.8 (fi 6) (either term, 3-0-3/2). Boolean algebra, truth tables, Karnaugh maps. Switching devices and their symbology with an introduction to NAND and NOR logic. Number systems, codes, minimization procedures, synthesis of combinational networks. Synchronous sequential circuits, flip-flops, counters. Arithmetic circuits. Introduction to computer-aided design and simulation tools for digital design and implementation. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Credit may be obtained in only one of E E 280 or CMPUT 329.

#### **E E 315 Engineering Electromagnetics I**

★3.5 (fi 6) (first term, 3-1s-0). Review of vector calculus, electrostatics, and magnetostatics. Electric and magnetic fields in material media, including polarization mechanisms and general boundary conditions. Solutions to static field problems. Maxwell's equations and waves in free space, dielectrics and conducting media. Reflection and refraction, standing waves. Prerequisites: MATH 102, 209 and PHYS 230.

#### **E E 323 Analytical Methods in Electrical Engineering**

★3.5 (fi 6) (either term, 3-1s-0). Introduction to analytical solutions of partial differential equations, eigenfunctions and eigenvalue problems, special functions in cylindrical and spherical coordinates, Green's functions, and transform methods. These concepts provide the necessary mathematical foundation for understanding and analyzing important physical phenomena encountered at the micro and nanoscales. Examples drawn from electromagnetics, quantum mechanics, solid-state physics, photonics, thermal transport, and microelectromechanical systems. Prerequisites: E E 238 and MATH 309 or 311.

#### **E E 330 Introduction to Power Engineering**

★3 (fi 6) (either term, 3-0-0). Overview of power concepts, three-phase circuits, transformer and its characteristics, per-unit calculation, transmission line and its basic operational characteristics, introduction to power systems. Prerequisite: E E 250.

#### **E E 332 Electric Machines**

★3.8 (fi 6) (either term, 3-0-3/2). Principles of electromagnetic force and torque in rotating machinery. Simple AC and DC machines. Induction motor theory. Practical aspects of induction motor use: characteristics, standards, starting, variable speed operation. Synchronous machine theory and characteristics. Fractional HP motor theory. Safety in electrical environments. Prerequisite: E E 330 or consent of Department.

#### **E E 338 Discrete Time Signals and Systems**

★3.8 (fi 6) (either term, 3-0-3/2). Discrete time signals and systems; Sampled

signals and sampling theorem, aliasing, A/D converter; Z-transform, stability analysis; Discrete-time Fourier transform; Discrete Fourier transform, leakage, spectral analysis; Digital filter design, filter structure. Prerequisite: E E 238.

#### **E E 340 Electronic Devices**

★4.3 (fi 6) (first term, 3-1s-3/2). PN junction semiconductor basics, charge flow and diode equation. Zener diodes. BJT and MOSFET devices and operating regions. Amplifier basics: biasing, gain, input and output resistance, analysis and design. Large signal effects. Differential amplifiers. "Requires payment of additional student instructional support fees." Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisite: E E 250.

#### **E E 350 Analog Electronics**

★4.3 (fi 6) (either term, 3-1s-3/2). Frequency response of transistor amplifiers: basic high frequency model, dominant pole calculation and design. Feedback application in amplifier circuits. Op-amp circuit design, real op-amps, open and closed loop response. Filters and tuned amplifier circuits. A/D and D/A converter circuits. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisite: E E 340.

#### **E E 351 Digital Electronics**

★4.3 (fi 6) (either term, 3-1s-3/2). MOS digital circuits, logic gates, threshold voltages. MOS logic families: design and simulation. CMOS timing: propagation delay, rise and fall times. Storage elements, memory, I/O and interfacing. Prerequisites: E E 280 or CMPUT 329, and E E 340.

#### **E E 357 Control Systems I**

★3.8 (fi 6) (either term, 3-0-3/2). Linear system models. Time response and stability. Block diagrams and signal flow graphs. Feedback control system characteristics. Dynamic compensation. Root locus analysis and design. Frequency response analysis and design. This course may not be taken for credit if credit has already been obtained in either E E 462 or 469. Prerequisites: E E 250 and 238.

#### **E E 380 Introduction to Microprocessors**

★3.8 (fi 6) (either term or Spring/Summer, 3-0-3/2). Microcomputer architecture, assembly language programming, sub-routine handling, memory and input/output system and interrupt concepts. Prerequisite: E E 280 or CMPUT 329. Credit may be obtained in only one of E E 380 or CMPUT 229.

#### **E E 387 Probability for Electrical and Computer Engineers**

★3.5 (fi 6) (either term, 3-1s-0). Deterministic and probabilistic models. Basics of probability theory: random experiments, axioms of probability, conditional probability and independence. Discrete and continuous random variables: cumulative distribution and probability density functions, functions of a random variable, expected values, transform methods. Pairs of random variables: independence, joint cdf and pdf, conditional probability and expectation, functions of a pair of random variables, jointly Gaussian random variables. Sums of random variables: the central limit theorem; basic types of random processes, wide sense stationary processes, autocorrelation and crosscorrelation, power spectrum, white noise. Prerequisites: E E 231 and 238.

#### **E E 390 Introduction to Communication Systems**

★3.8 (fi 6) (either term, 3-0-3/2). Basics of analog communication: amplitude, angle, and analog pulse modulation; modulators and demodulators; frequency multiplexing. Basics of digital communication: sampling, quantization, pulse code modulation, time division multiplexing, binary signal formats. Prerequisite: E E 238.

#### **E E 400 Electrical Engineering Design Project I**

★2.5 (fi 6) (first term, 1-0-3). The first of two design courses that must be taken in the same academic year. Student teams research, propose, design, develop, document, prototype, and present a practical engineering system or device; teams exercise creativity and make assumptions and decisions based on technical knowledge. This first course includes project definition, planning, and initial prototyping. Formal reports and presentation of the project proposal is required. Corequisites: E E 350, 380.

#### **E E 401 Electrical Engineering Design Project II**

★2.5 (fi 6) (second term, 1-0-3). The second of two design courses that must be taken in the same academic year, in which student teams develop an electronic system or device from concept to working prototype. Emphasis is placed on continued execution of the project plan developed in E E 400. Formal interim and final reports are required; groups demonstrate and present their designs. Prerequisite: E E 400 in the preceding Fall term.

#### **E E 404 Reliability Engineering**

★3 (fi 6) (either term, 3-0-0). Study of how and why electrical and mechanical systems and components fail; Murphy's law; definitions of reliability and failure modes; practical statistical distributions and frequency and duration approach for designing and evaluating system and component reliability levels; repairable, non-repairable and standby systems. Prerequisite: E E 387 or equivalent.

#### **E E 430 Power System Analysis**

★3 (fi 6) (either term, 3-0-0). Review of power system components; transmission line design and line parameters; transmission line operation and characteristics;

active and reactive power and impact on line operation; power flow computations; economic operation of power systems. Prerequisite: E E 330.

#### E E 431 Power Electronics

★3.8 (fi 6) (either term, 3-0-3/2). Introduction to power electronics. AC-DC conversion. DC-AC conversion. DC-DC conversion. AC-AC conversion. Prerequisite: E E 340.

#### E E 432 Variable Speed Drives

★3.8 (fi 6) (either term, 3-0-3/2). Introduction to variable speed drives. Frequency, phase and vector control of induction motors. Dynamic models for induction motors. Permanent magnet synchronous and brushless dc motor drives. Prerequisite: E E 332.

#### E E 433 Power System Stability and Transients

★3.8 (fi 6) (either term, 3-0-3/2). Introduction to power system transient states. Power system voltage stability; PV and QV curve methods. Power system angular stability; transient stability and equal area criterion; steady-state stability and power system stabilizer. Electromagnetic transients in power systems, insulation coordination and equipment protection. Methods of power system design and simulation. Prerequisites: E E 330, 332.

#### E E 434 Power System Protection

★3 (fi 6) (either term, 3-0-0). Short-circuit and other faults in power systems. Analysis of faulted power systems, symmetrical components theory, components of power system protection, various protection schemes and relays. Prerequisite: E E 330, 332.

#### E E 442 Introduction to Multimedia Signal Processing

★3.8 (fi 6) (either term, 3-0-3/2). Human visual/audio perception and multimedia data representations. Multimedia enhancement, histogram equalization, noise removal, and edge detection. Image interpolation, digital zooming and error concealment. Fundamentals of compression, transforms, lossless and lossy compression. Multimedia compression, transform coding, and JPEG/MPEG image compression standards. Multimedia communications over networks. Multimedia security, digital rights management, watermarking, and IP protection. Prerequisite: E E 338 or consent of Instructor.

#### E E 445 Computation for Nanoengineering

★3 (fi 6) (either term, 3-0-0). Introduction to advanced numerical methods such as finite-difference, finite-element and spectral-domain techniques for solving partial differential equations. Simulations of nanoscale systems involving multiphysics or coupled differential equations involving electron and thermal transport phenomena, electrodynamics, MEMS, and process simulation, graphical methods for 3D visualization of simulation data. Examples from applied areas of nanoengineering to demonstrate computational methods for understanding complex physical phenomena and for designing and simulating nanoscale devices and systems. Prerequisite: consent of the Department.

#### E E 450 Nanoscale Phenomena in Electronic Devices

★3.8 (fi 6) (either term, 3-0-3/2). Semiconductor device physics, device scaling trends, advanced MOSFET fabrication and the associated quantum mechanical framework in nanoscale systems. Semiconductor devices as a system of elemental components. Quantum phenomena in the evaluation of semiconductor devices. Impact of new materials such as high-k gate dielectrics, copper damascene processing and diffusion barriers on device performance. Choice of channel materials and strain condition for ultrascaled logic devices, RF and power electronic devices. Prerequisite: E E 340.

#### E E 451 RF Communication Circuits

★4.5 (fi 6) (either term, 3-0-3). Introduction to radio communications systems. Frequency selective circuits and transformers. Parallel resonant circuits including transformers. Double-tuned circuits. Impedance matching. Oscillators. Conditions for oscillation. Amplitude limitation mechanisms. Phase stability. Crystal oscillators. Mixers. Diode-ring mixers. Square-law mixers. BJT mixers. Intermodulation distortion. Modulators and demodulators. Average envelope detectors. FM demodulators. High frequency amplifiers and automatic gain control. Broadband techniques. Neutralization. Phase-lock loops. Phase detectors. Voltage-controlled oscillators. Loop filters. Phase-locked loop applications. Power amplifiers. Prerequisite: E E 350. Corequisite: E E 357 or 462.

#### E E 453 Integrated Circuit Design

★3.8 (fi 6) (either term, 3-0-3/2). Very Large Scale Integration (VLSI) design techniques and their application. Electrical characteristics of MOSFET devices and CMOS circuits. Use of CAD tools for simulation and integrated circuit layout. Modeling delays, advanced digital logic circuit techniques, memory. Prerequisite: E E 351; corequisite: CMPE 480.

#### E E 455 Engineering of Nanobiotechnological Systems

★3 (fi 6) (either term, 3-0-0). Microfluidic and nanobiotechnological devices. Fabrication techniques for devices: self-assembly, lithographic technologies. Applications of nanobiotechnology in computing, electronics, human health, environment and manufacture. Prerequisite: consent of the Department.

#### E E 456 Introduction to Nanoelectronics

★3 (fi 6) (either term, 3-0-0). Fundamental concepts related to current flow

in nanoelectronic devices. Energy level diagram and the Fermi function. Single-energy-level model for current flow and associated effects, such as the quantum of conductance, Coulomb blockade, and single electron charging. The Schroedinger equation and quantum mechanics for applications in nanoelectronics. Matrix-equation approach for numerical band structure calculations of transistor channel materials. k-space, Brillouin zones, and density of states. Subbands for quantum wells, wires, dots, and carbon nanotubes. Current flow in nanowires and ballistic nanotransistors, including minimum possible channel resistance, quantum capacitance, and the transistor equivalent circuit under ballistic operation. Prerequisite: E E 340.

#### E E 457 Microfabrication and Devices

★4 (fi 6) (either term, 3-0-2). Microfabrication processes for CMOS, bipolar, MEMS, and microfluidics devices. Laboratory safety. Deposition processes of oxidation, evaporation and sputtering. Lithography, wet and dry etch, and device characterization. Note: Consent of Department required.

#### E E 458 Introduction to Micro Electro Mechanical Systems

★3 (fi 6) (either term, 3-0-0). Overview of microelectromechanical (MEMS) systems, applications of MEMS technology to radio frequency, optical and biomedical devices. Basic MEMS building blocks, cantilever and clamped-clamped beams. Actuation mechanisms of mechanical microdevices, thermal and electrostatic. The thin film fabrication process, deposition, lithography, etching and release. MEMS in circuits, switches, capacitors, and resonators. Prerequisites: E E 250 or consent of Instructor.

#### E E 459 Introduction to Nanotechnology

★3 (fi 6) (either term, 3-0-0). Existing micro/nanofabrication and characterization technologies including advanced nanolithography and soft lithography techniques. Overview of scanned probe microscopy techniques such as AFM, STM, and NSOM. Introduction to nanomaterials such as fullerenes, carbon nanotubes, and block copolymers. Quantum mechanical effects and properties of nanostructures. Overview of applications of nanotechnology in microelectronics, photonics and MEMS devices.

#### E E 460 Control Systems II

★3.8 (fi 6) (either term, 3-0-3/2). State space analysis methods, stability, observability and controllability. State space design methods, pole placement and optimal state feedback control, observer design. Introduction to nonlinear control systems, phase-plane method, describing function method, stability and limit cycles, Lyapunov method. Introduction to adaptive control, neural network control and fuzzy control systems with case study examples. Prerequisite: E E 357.

#### E E 461 Digital Control

★3.8 (fi 6) (either term, 3-0-3/2). Sampled-data control systems, discretization, transfer function and state space models. Controllability and observability, pole assignment, deadbeat control. State observers, observer based controllers, introduction to optimal control. Prerequisites: E E 338 and either E E 357 or E E 462.

#### E E 462 Fundamentals of Control Systems Engineering

★3.8 (fi 6) (second term, 3-0-3/2). Laplace transforms. Transfer function models of physical systems. First and second order systems. Stability and properties of feedback. PID controllers. Frequency domain analysis and design. Digital control. Case studies. Prerequisites: MATH 201. Note: This course may not be taken for credit if credit has already been obtained in either E E 357 or 469.

#### E E 464 Medical Robotics and Computer-Integrated Intervention

★3.8 (fi 6) (either term, 3-0-3/2). Basic concepts of computer-integrated intervention. Surgical CAD/CAM, assist and simulation systems. Actuators and imagers. Medical robot design, control and optimization. Surgeon-robot interface technology. Haptic feedback in surgical simulation and teleoperation. Virtual fixtures. Time delay compensation in telesurgery. Cooperative manipulation control. Overview of existing systems for robot-assisted intervention and for virtual-reality surgical simulation. Prerequisite: E E 357 or E E 462 or consent of the Department.

#### E E 471 Photonics I

★3.8 (fi 6) (either term, 3-0-3/2). Electromagnetic wave propagation at optical frequencies and approximations. Thermal and luminescent light sources, optical beams. Ray and Gaussian optics and simple optical components. Wave optics, polarization, interference, interferometric devices. Light-matter interactions. Optics of crystals; polarizers and waveplates. Photodetectors. Photonic engineering applications. Prerequisite: E E 315. Note: Only one of the following courses may be taken for credit: E E 471 or PHYS 362.

#### E E 472 Photonics II

★3 (fi 6) (either term, 3-0-0). Interaction of radiation with atoms, laser oscillations and threshold conditions, 3- and 4-level laser systems, rate equations, special properties of laser light, cavity Q and photon lifetime, optical resonators and lens waveguides, Gaussian beams, gain saturation, Q-switching, mode locking, interaction of light and sound, holography. Description of various lasers: solid, gas, semiconductor, dye, Raman and chemical. Laser applications. Prerequisite: E E 471 or PHYS 362 or consent of Instructor.

#### E E 473 Antennas and Propagation

★3 (fi 6) (second term, 3-0-0). Antenna fundamentals, arrays of antennas, corner



reflectors, helices, slots, paraboloids, practical considerations and feeding methods. Friis transmission equation, propagation between elevated antennas over lossy earth, Fresnel zones and the effect of obstacles, earth curvature and the effects of refraction, ionospheric reflection. Prerequisites: E E 315.

#### **E E 474 Introduction to Plasma Engineering**

★3 (fi 6) (either term, 3-0-0). Definition of plasma. Behavior in electric and magnetic fields. Particle, kinetic and fluid description of flow and transport phenomena. Waves in plasmas. Current approaches to thermonuclear fusion. High temperature laser produced plasmas and low temperature DC and RF discharge plasmas. Applications in discharge pumping of lasers, plasma etching, thin film deposition and generation of x-rays. Prerequisite: E E 315 or equivalent.

#### **E E 475 Optoelectronic and Photovoltaic Devices**

★3 (fi 6) (either term, 3-0-0). Basic optical properties of crystalline and amorphous semiconductor materials: energy band diagrams, optical constants. Recombination and light emission in semiconductors. Light emitting diodes: spectral characteristics, materials, and applications. Stimulated emission and laser oscillation conditions in semiconductors. Laser diodes: modal and spectral properties, steady state rate equations, materials and structures. Light absorption, optical to electrical energy conversion. Photovoltaic cells: fill factors and efficiency, temperature effects, alternative materials and structures. Prerequisite: E E 340.

#### **E E 476 Advanced Electromagnetics**

★3.8 (fi 6) (either term, 3-0-3/2). Electrostatics and magnetostatics; Maxwell's Equations and planes waves; Transmission lines, Smith Chart; Waveguides; Cavity resonators; Radiation and Antennas; Dipoles. Prerequisite: E E 315.

#### **E E 478 Microwave Circuits**

★3.8 (fi 6) (either term, 3-0-3/2). Introduction to RF/microwave circuits and their applications. Maxwell's Equations and basic wave-propagation concepts. Transmission-line theory and impedance-matching techniques. Practical planar transmission lines. Lumped and distributed microwave-circuit elements. Microwave network analysis using impedance/admittance parameters, scattering parameters, and transmission-matrix methods. Analysis, design, fabrication, and test of practical RF/microwave devices including power dividers/combiners, couplers, amplifiers, and filters. Prerequisites: E E 315.

#### **E E 485 Digital Communications**

★3.8 (fi 6) (either term, 3-0-3/2). Principles of digital communication techniques such as source coding, channel coding, signal space concepts, digital modulation, intersymbol interference, and pulse shaping. Design of optimal receivers and the study of their performance in the presence of channel noise. Prerequisites: E E 387, 390.

#### **E E 486 Wireless Communications**

★3 (fi 6) (either term, 3-0-0). Basic concepts of wireless communication systems such as propagation loss and antenna gains, cellular system design, multi-path propagation, fading channel models, multiple-access techniques, and diversity. Discussion of digital modulation schemes for wireless systems as well as introduction to differential and non-coherent wireless communication systems. Prerequisites: E E 387, 390.

#### **E E 489 Telecommunication Systems Engineering**

★3 (fi 6) (either term, 3-0-0). Telephony basics, subscriber loop plant, 2 Wire-4 Wire conversion, loss plan for echo-loss-delay. Traffic theories: Poisson, Erlang B, Engset, Erlang C, efficiency of large groups. Optimum alternate route design, network architecture, volume, stability assurance, call routing, multi-stage circuit switch design, central office functions, time-space-time and space-time-space switching. Point-to-point fibre links, optical networks. Prerequisites: E E 387 and E E 390.

#### **E E 494 Engineering Physics Design Project I**

★2.5 (fi 4) (either term, 1-0-3). Organization seminars for the research and design project in the following term. Coverage of elements of ethics, equity, concepts of sustainable development and environmental stewardship, public and worker safety and health considerations including the context of the Alberta Occupational Health and Safety Act.

#### **E E 495 Engineering Physics Design Project II**

★4 (fi 6) (either term, 1-0-6). Engineering Physics student design projects. Prerequisite: E E 494 in the preceding Fall term.

#### **E E 496 Nanoengineering Option Research and Design Project Seminar**

★0.5 (fi 2) (first term, 0-1s-0). Organization seminars for the research and design project in the following term. Coverage of elements of ethics, equity, concepts of sustainable development and environmental stewardship, public and worker safety and health considerations including the context of the Alberta Occupational Health and Safety Act.

#### **E E 497 Nanoengineering Option Research Project**

★3 (fi 6) (second term, 0-0-6). Engineering Physics (Nanoengineering Option) student research projects.

#### **E E 498 Special Topics in Electrical Engineering**

★3 (fi 6) (first term, 3-0-0). Intended to enable individuals or a small group of students to study topics in their particular field of interest under the supervision

of a member of the Department of Electrical and Computer Engineering or other appropriate departments.

#### **E E 499 Special Topics in Electrical Engineering**

★3 (fi 6) (second term, 3-0-0). Intended to enable individuals or a small group of students to study topics in their particular field of interest under the supervision of a member of the Department of Electrical and Computer Engineering or other appropriate departments.

## Graduate Courses

**Note:** See listing of Electrical and Computer Engineering (ECE) graduate courses.

### 231.120 Engineering, Computer, ENCMP

Department of Electrical and Computer Engineering  
Faculty of Engineering

#### Undergraduate Courses

##### **ENCMP 100 Computer Programming for Engineers**

★3.8 (fi 8) (either term, 3-0-1.5). Fundamentals of computer programming with emphasis on solving engineering problems. Syntax, variables, statements, control structures, functions, data structures, files, pointers, memory use, searching, sorting, recursion.

### 231.121 Engineering, General, ENGG

Faculty of Engineering

#### Undergraduate Courses

##### **ENGG 100 Orientation to the Engineering Profession I**

★1 (fi 3) (first term, 1-0-0). An introduction to the Faculty of Engineering and the engineering profession: the engineering disciplines; study skills; cooperative education; work opportunities; engineering and society including elements of ethics, equity, concepts of sustainable development and environmental stewardship, public and worker safety and health considerations including the context of the Alberta Occupational Health and Safety Act.

##### **ENGG 101 Orientation to the Engineering Profession II**

★1 (fi 3) (second term, 1-0-0). An introduction to the engineering profession and its challenges: the engineering disciplines, career fields; professional responsibilities of the engineer including elements of ethics, equity, concepts of sustainable development and environmental stewardship, public and worker safety and health considerations including the context of the Alberta Occupational Health and Safety Act.

##### **ENGG 130 Engineering Mechanics**

★4 (fi 8) (either term, 3-0-2). Equilibrium of planar systems. Analysis of statically determinate trusses and frames. Friction. Centroids and centres of gravity. Forces and moments in beams. Second moments of area. Note: Students in all sections of this course will write a common final examination. Corequisite: MATH 100.

##### **ENGG 299 Orientation to Cooperative Education**

★1.5 (fi 2) (first term, 1-1s-0). An examination of the history, philosophy and objectives of Cooperative Education; introduction to the operation of the Cooperative Education Program; self-assessment of transferable skills and work values; preparation of the resume; practice of job interview skills; goal setting on the job; ethics; human rights; and public and worker safety and health considerations including the context of the Alberta Occupational Health and Safety Act. Note: This course is only open to students registered in the Cooperative Education Program and must be taken prior to a student's first work placement.

##### **ENGG 400 The Practice of the Engineering Profession**

★1 (fi 2) (second term, 1-0-0). The technical and professional duties and responsibilities of the engineer; the ethics of the engineering profession; technical and professional organizations. The role of the engineer in the social environment including elements of equity, concepts of sustainable development and environmental stewardship, public and worker safety and health considerations including the context of the Alberta Occupational Health and Safety Act. Note: Restricted to fourth-year traditional and fifth-year co-op engineering students.

##### **ENGG 404 Engineering Safety and Loss Management**

★3.8 (fi 6) (first term, 3-3s/2-0). A broad study of the principles and practices of providing a safe and reliable working environment in all types of major industries. Government regulatory requirements are reviewed. The key topics of study, using leading industry practices, are industrial health, safety, and environmental risks. The course emphasizes the importance of the decisions of engineers and business managers in protecting workers, the environment, assets, production, and the public in general. Plant visits, case studies, and guest lecturers from industry and government are included. Requires payment of additional student

instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisite: Completion of at least three years of study in Engineering or Business or by consent of the Instructor.

#### **ENGG 406 Engineering Safety and Risk Management**

★3.8 (fi 6) (second term, 3-3s/2-0). A comprehensive study of the theories and practices of providing a low-risk working environment in all types of major industries, with particular emphasis on risk analysis/management solutions. Case studies of recent industrial disasters and industrial site visits are used to focus on proactive management techniques. The course strongly emphasizes risk analysis, risk management, and loss control. Techniques of leadership, management, and motivation to provide excellence of results are emphasized. Legal and ethical responsibilities of engineers and business managers are reviewed. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisite: Completion of at least three years of study in Engineering or Business or by consent of the Instructor.

#### **ENGG 420 Engineering Law**

★3 (fi 6) (either term, 3-0-0). Contracts; specifications; tenders; bonds; construction contract forms; Public Works Act; Workers' Compensation Act; building trades; company law; the engineer as an expert witness; patents; trade marks; copyrights; negligence; arbitration. Note: Restricted enrolment. Registration approval by Dean's office only. Credit will not be granted for both ENGG 420 and B LAW 301.

### Graduate Courses

#### **ENGG 600 Engineering Ethics and Integrity**

★0.5 (fi 1) (either term, 0-1s-0). The technical and professional duties and responsibilities of the engineer. Academic integrity and research ethics. Intellectual property. The ethics of the engineering profession; technical and professional organizations. The impact of engineering decisions on society, including elements of equity, concepts of sustainable development and environmental stewardship, public and worker safety and health considerations including the context of the Alberta Occupational Health and Safety Act. Intellectual property. Note: Restricted to engineering graduate students.

## 231.122 Engineering Management, ENG M

Department of Mechanical Engineering  
Faculty of Engineering

### Undergraduate Courses

#### **ENG M 310 Engineering Economy**

★3 (fi 6) (either term or Spring/Summer, 3-0-0). The application of the fundamentals of economics to engineering alternatives in planning, developing and managing industrial projects. Note: Credit cannot be obtained for more than one of ENGG 310, 401, ENG M 310 or 401.

#### **ENG M 401 Financial Management for Engineers**

★3 (fi 6) (either term, 3-0-0). The application of the fundamentals of engineering economics, financial analysis and market assessment to engineering alternatives in the planning, development and ongoing management of industrial enterprises. The course covers the use of engineering, economic, financial and market assessment information in investment and business operation decisions in technology oriented companies. Note: Credit cannot be obtained for more than one of ENGG 310, ENGG 401, ENG M 310, or ENG M 401.

#### **ENG M 402 Project Management and Entrepreneurship**

★3 (fi 6) (either term, 3-0-0). Introduction to the conceptual and practical considerations in identifying and developing new products. The theory and practice of project management applied to the creation of new business activities and ventures will be discussed. Topics include project management, innovation and entrepreneurship, business planning, marketing, and mobilizing human and financial resources. These will be applied in the development of a business plan for a business concept. The course is intended to provide engineering and business students with an awareness of specific planning, budgeting and scheduling techniques that can be used to implement and monitor new business activities. Prerequisites: Completion of at least six academic terms. This course is open to Business and Science students with consent of Instructor. Note: Credit cannot be obtained for both ENGG 402 and ENG M 402.

#### **ENG M 403 Engineering, Environment and Society**

★3 (fi 6) (either term, 3-0-0). The role of engineering and management in addressing environmental and socioeconomic factors associated with engineered projects and the impact of technology on society. This course covers the various roles that engineers can play in the development and delivery of new enterprises and projects with particular emphasis on evolving environmental and social demands placed upon project proponents. The impact of these projects on society and the various approaches that can be used to promote the successful delivery of projects are considered. Note: Credit cannot be obtained for both ENGG 403 and ENG M 403.

#### **ENG M 405 Engineering, Business and Society**

★3 (fi 6) (either term, 3-0-0). The role of engineering and management in achieving the objectives of technology oriented enterprises, and the impact of technology on society. The course covers alternate forms of organization, key differences between management of a one time project and an ongoing operation, the impact of work on society, individual variations in personality and management style and the implications for managing, and specific issues in human resource and quality management. Note: Credit cannot be obtained for both ENGG 405 and ENG M 405.

#### **ENG M 406 Adapting Technology to Meet Societal Needs**

★3 (fi 6) (either term, 3-0-0). Assessing impact of technology on companies and society using marketing principles. How societal issues drive customer needs and how those needs are recognized and met. Topics include pre-engagement strategies (market research methods, customer contact process, customer/client adoption life cycle), engagement strategies (proposal preparation, contract development, and scheduling) and post-engagement strategies (winning contracts and developing long-term sound client relationships). Prerequisites: Open to all third or fourth year engineering students, or consent of instructor.

#### **ENG M 408 Manufacturing Systems and Engineering**

★3.8 (fi 6) (either term, 3-0-3/2). Manufacturing process modeling and system design; computer aided process planning; scheduling of manufacturing activities; computer aided manufacturing; integration for different machining processes; plastic parts and mold design; sheet metal parts and die design; robotics in manufacturing; welding process and control; Design considerations; Shop floor control; and engineering collaboration. Prerequisite: MEC E 265.

### Graduate Courses

#### **ENG M 501 Production and Operations Management**

★3 (fi 6) (either term, 3-0-0). Production and operations management, analysis, and design of work, forecasting, inventory management including MRP, JIT, and Kanban, maintenance management, facility layout, operations scheduling, and project planning and management. Credit cannot be obtained in both ENG M 501 and MEC E 513. Prerequisites: one of ENGG 310, 401 or ENG M 310, 401 and STAT 235 or equivalent.

#### **ENG M 508 Energy Auditing and Management**

★3 (fi 6) (either term, 3-0-0). Concepts and value of energy management and conservation. Methodologies for energy management in energy intensive systems in various industries. Energy auditing methods and implementation. Energy accounting and economic analysis. Energy audits and maintenance. Exposure to software for energy auditing.

#### **ENG M 510 Quality Engineering and Management**

★3 (fi 6) (either term, 3-0-0). Quality engineering and management evolution, definitions, concepts and principles. Essential quality management theories and models. ISO 9000 principles models and applications. Seven quality engineering and management tools. Quality function deployment. Failure analysis. Quality costing. Statistical quality. Credit cannot be obtained in both ENG M 510 and MEC E 512. Prerequisites: STAT 235 or equivalent.

#### **ENG M 514 Reliability for Design**

★3 (fi 6) (either term, 3-0-0). Concepts of reliability, failure rate, maintainability, and availability. Properties of various statistical distributions and their applications in reliability engineering. Failure data analysis techniques including probability plotting. Load and strength interference in mechanical component design. Design of components for high reliability. System reliability models and system reliability evaluation methods. Optimal system design considering reliability issues. Models for operation and maintenance of equipment. Credit may not be obtained for more than one of MEC E 514, ENG M 514, or E E 404. Prerequisite: STAT 235.

#### **ENG M 516 Maintenance Management of Industrial Systems and Facilities**

★3 (fi 6) (either term, 3-0-0). Management of maintenance of industrial assets. Maintenance philosophies. Types of maintenance. Reliability centered maintenance. Scheduling and computerized maintenance management systems. Spare parts provisioning. Maintenance implementation. Prerequisite: ENG M 514 or consent of Instructor.

#### **ENG M 530 Engineering Project Management**

★3 (fi 6) (either term, 3-0-0). Introduction to project management tools, techniques, templates, and methodologies. This course examines the eight knowledge areas of the Project Management Institute (PMI) which provide an integrated approach to managing engineering projects. Prerequisites: One of ENGG 310, 401 or ENG M 310, 401 and completion of at least six academic terms, or consent of instructor.

#### **ENG M 540 Introduction to Optimization Models and Algorithms**

★3 (fi 6) (either term, 3-0-0). An introduction to optimization methods in solving engineering management problems. Both modeling techniques and algorithms will be covered. Topics include linear programming, formulation and modeling techniques, the simplex method, sensitivity analysis, duality, transportation and network problems, algorithmic and heuristic methods, integer programming, and/or non-linear programming. Credit cannot be obtained in both ENG M 540 and ENG M 640.

**ENG M 541 Modeling and Simulation of Engineering Systems**

★4.5 (fi 6) (either term, 3-0-3). Modeling and analysis of systems and processes that include human decision making. Formulation and solution methods for systems involving associated economic functions. Numerical methods for simulation. Projects will utilize simulation software to support analysis and design of engineering systems and processes.

**ENG M 558 Ergonomics and Work Design**

★3 (fi 6) (either term, 3-0-0). Fundamental methods for the analysis of human systems in industrial engineering. Human-machine interaction. Engineering of the workplace and the work environment. Motion and time study. Standards in ergonomics and work design.

**ENG M 607 Lean Manufacturing**

★3 (fi 6) (either term, 3-0-0). Overview of lean manufacturing concepts, tools and techniques. Identifying waste. Value stream mapping, push vs. pull systems data analysis tools, cell layout design, operator balance charts, 5S, set up time reduction, work in process minimization, standardized work, visual management, and optimized floor space. Introduction to six sigma tools.

**ENG M 611 Design and Integration of Standardized Systems**

★3 (fi 6) (either term, 3-0-0). Design, development and use of international assurance and management standards in manufacturing, service and energy industries. Creation of standardized systems for quality, environmental, safety, security, responsibility, risk and other aspects of the organization. Modeling of integration frameworks and methodologies. Auditing, maintenance and improvement of integrated management systems.

**ENG M 612 Quality Assurance and Assessment Systems**

★3 (fi 6) (either term, 3-0-0). Current theory and practice of quality management systems. Modeling of systems and supporting technologies for performance management and improvement. ISO 9000 and 10000 standards, business excellence models and performance measurement. Application of quality assurance schemes in manufacturing, service and not-profit organizations. Design, implementation and improvement of assurance systems using auditing and self-assessment models. Auditing standards and self-assessment guidelines.

**ENG M 620 Engineering Economic Analysis**

★4 (fi 6) (either term, 3-2s-0). Advanced topics in engineering economics including operating and capital budgets, financial statement use by managers, replacement analysis, cost of capital and leasing. Credit cannot be obtained for both ENG M 620 and ENG M 401.

**ENG M 632 Project Risk Management**

★3 (fi 6) (either term, 3-0-0). An in-depth study of the risk management framework as adopted by Project Management Institute. Responsibilities and risks encountered while managing any project. Identification and quantification of risk in design and execution of projects, strategies to handle risk, and issues related to decision making in the face of uncertainty.

**ENG M 643 Energy Simulation and Modeling**

★3 (fi 6) (either term, 3-0-0). Methodologies for simulation of energy systems. Energy forecasting and planning models. Modeling and forecasting of energy and environmental scenarios. Use of energy and environment database models. Decision support systems for the energy industry. Exposure to software relevant to the energy industry.

**ENG M 646 Engineering Optimization**

★3 (fi 6) (either term, 3-0-0). The applications of optimization techniques in solving engineering problems. Linear programming, non-linear programming, dynamic programming, integer programming, stochastic programming, genetic algorithms, heuristic methods, queuing theory, and new optimization methods. Credit may not be obtained in more than one of ENG M 640, MEC E 612, and ENG M 646. Prerequisite: ENG M 540 or consent of Instructor.

**ENG M 655 Personality Theory and Technical Management**

★3 (fi 6) (either term, 3-0-0). This course reviews current thinking on personality theory (using Carver and Scheier's model of seven theoretical perspectives on personality), and looks at the implications for managing that arise from each theoretical perspective. In particular, managing in technical settings with a diverse range of skill types and levels frequently calls for diversity in management approaches that reflect the inherent diversity in the people being managed. The Myers Briggs Type Indicator, widely used in business settings, is reviewed in greater detail. Management styles and the nature of management thinking and decision making are discussed.

**ENG M 657 Interpersonal Skills for Project Managers**

★3 (fi 6) (either term, 3-0-0). Theoretical basis of speaking and listening skills supported by exercises and practical examples. Non-verbal clues, assumptions and perceptions in communication. Applications in negotiations, conflict management and decision making.

**ENG M 660 Special Topics in Technology Commercialization**

★3 (fi 6) (second term, 3-0-0). This course examines the fundamentals of starting, financing and managing an advanced technology business. Teams of students will each find a high-tech opportunity and develop a business and financing plan

to start and grow the business. Guest lectures from experts who have practical experience in the various subject areas of business development will be coordinated with the main course lectures and the various stages of developing the business and financing plans. Oral and written presentation of various phases of the plan will be prepared by each group and delivered at various intervals. By the end of the term the team will have developed a written business plan/investment proposal and a financing plan to demonstrate the viability of the opportunity.

**ENG M 665 Introduction to Intellectual Property and New Technology Commercialization**

★3 (fi 6) (either term, 3-0-0). Intellectual property in the context of technology transfer and commercialization. Key topics include intellectual property, product development, valuation of technology, capturing value, and securing the deal. Considerations in identifying and developing new products, exploitation of intellectual property as a corporate strategy, the impact of intellectual property in new company formation and growth.

**ENG M 666 Knowledge Management**

★3 (fi 6) (either term, 3-0-0). Knowledge Management (KM) concepts, Knowledge Acquisition, Building and Sharing Corporate Memory, Knowledge Driven Innovation, Knowledge Capital Value, Knowledge Professionals, KM Technologies, Case Studies, Team Projects. Prerequisite/Corequisite: approval of instructor.

**ENG M 670 Advanced Topics in Engineering Management I**

★3 (fi 6) (either term, 3-0-0).

**ENG M 680 Advanced Topics in Engineering Management II**

★3 (fi 6) (either term, 3-0-0).

**231.123 Engineering Physics, EN PH**

Department of Physics  
Faculties of Engineering and Science

**Undergraduate Courses****EN PH 131 Mechanics**

★4.3 (fi 6) (either term, 3-1s-3/2). Kinematics and dynamics of particles; gravitation; work and energy; linear momentum; angular momentum; systems of particles; introduction to dynamics of rigid bodies. Prerequisites: MATH 100, ENGG 130. Corequisite: MATH 101. Prerequisite or corequisite: PHYS 130. Restricted to Engineering students. Other students who take this course will receive ★3.0.

**231.124 English, ENGL**

Department of English and Film Studies  
Faculty of Arts

**Note:** Courses in the Department of English and Film Studies teach the English language and its several literatures; some works may be taught in translation as necessary to fulfill the primary goal of understanding English literature.

See also Writing, WRITE. Except as noted, WRITE courses may be taken as ENGL courses.

**Undergraduate Courses****Notes**

- (1) Most students will take ENGL 121, 122, 123, 124 or 125, which will serve as the prerequisite to all senior English courses, or will fulfill degree requirements for faculties that require first-year English. All five of these half year courses study selected works from a range of genres (poetry, drama, fiction or nonfiction). Students with credit in ENGL 100, 101, 111, 112, 113 or 114 may not take current ENGL 121, 122, 123, 124 or 125.
- (2) No more than ★6 in junior English, or equivalent, may be taken for credit in an undergraduate program.
- (3) Junior English courses require a substantial amount of writing in essays and tests, and devote a minimum of 30% of class time to writing instruction.
- (4) All senior courses have as prerequisite ENGL 121, 122, 123, 124, 125 or equivalent; prerequisites for 400-level courses are ★12 of senior ENGL, ★6 of which must be at the 300-level (as numbered in this edition of the Calendar, including any specific course prerequisites in the individual course descriptions).
- (5) Courses at the 200 level need not be tied to any one national literature or historical period.
- (6) Not all senior courses are offered in any given year.

**ENGL 108 Introduction to Language and Literature**

★3 (fi 6) (first term, 3-0-0). This course combines formal instruction in writing with a study of the essay and the short story. One-half of class time will be devoted to writing instruction. This course may be followed only by ENGL 109. Note: Not to be taken by students in Arts and Education. This course will be offered by arrangement with client Faculties.



**ENGL 121 Literature in Historical Perspective**

★3 (fi 6) (either term, 3-0-0). An introduction to the social, historical and formal dimensions of literature. A variety of traditions written in English may be taught in this course. Not to be taken by students with ★6 in approved junior English.

**ENGL 122 Texts and Contexts**

★3 (fi 6) (either term, 3-0-0). This course explores a specific issue using a variety of genres and media. Not to be taken by students with ★6 in approved junior English. Note: Sections reserved for student in the TYP Program include a 3 hour seminar component in addition to the 3 hour lecture component.

**ENGL 123 Literature in Global Perspective**

★3 (fi 6) (either term, 3-0-0). Studies in the literatures of the English-speaking world. Not to be taken by students with ★6 in approved junior English.

**ENGL 124 Literary Analysis**

★3 (fi 6) (either term, 3-0-0). This course is designed to familiarize students with key literary terms and practices. Not to be taken by students with ★6 in approved junior English.

**ENGL 125 Aboriginal Writing**

★3 (fi 6) (either term, 3-0-0). Studies in Aboriginal knowledge, values, and identity in written expression, and other cultural texts. Not to be taken by students with ★6 in approved junior English. Note: Sections reserved for students in the TYP Program include a 3 hour seminar component in addition to the 3 hour lecture component.

**ENGL 126 Reading Popular Culture**

★3 (fi 6) (either term, 3-0-0). An introduction to post-secondary studies in English through the close reading of popular culture texts such as zines, magazines, film, television, advertising, the internet, and non-canonical fiction and non-fiction. Not to be taken by students with ★6 in approved junior English.

**ENGL 199 Essentials of Writing for Engineering Students**

★3 (fi 6) (either term, 3-0-0). This course is designed to develop the student's ability to write the narrative, descriptive, expository, and persuasive prose fundamental to all written communication. Instruction and practice will be integrated with the study of prose models drawn from modern essayists. A review of basic grammar will be included. Note: Restricted to students in the Faculty of Engineering only.

**ENGL 208 Reading Histories: Making Books**

★3 (fi 6) (either term, 3-0-0). An introduction to the social and cultural history of material text, and to the critical concepts and methods key to its study, that emphasizes the relationship between the production of books and the production of culture. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 209 Reading Histories: Making Readers**

★3 (fi 6) (either term, 3-0-0). An introduction to the social and cultural history of reading, and to the critical concepts and methods key to its study, that emphasizes the relationship between reading and the production of culture. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 210 Reading Histories: Histories in Texts**

★3 (fi 6) (either term, 3-0-0). An introduction to the critical concepts and methods for reading literary texts historically that emphasizes the relationship between representation and history. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 212 Introduction to the English Language**

★3 (fi 6) (either term, 3-0-0). Introduces the grammar of English sounds, words, and sentences as a basis for further studies in language and literature. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 217 Textualities: Signs and Texts**

★3 (fi 6) (either term, 3-0-0). An introduction to theories of signification and textuality, and to the issues and debates surrounding the relationship between language systems and the production of meanings, as they bear on literary analysis. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 218 Textualities: Reading and Interpretation**

★3 (fi 6) (either term, 3-0-0). An introduction to theories of reading and interpretation, and to the issues and debates surrounding the relationship between literary events and the reception of meanings, as they bear on literary analysis. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 219 Textualities: Narrative Theory and Poetics**

★3 (fi 6) (either term, 3-0-0). An introduction to narratology and poetics, as well as to the practices of close reading and the formalist analysis of literary texts, as they bear on literary analysis. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 220 Reading Politics: Gender and Sexuality**

★3 (fi 6) (either term, 3-0-0). An introduction to dynamics of gender and sexuality in literary and other cultural texts, and to the critical concepts and methods key to their study. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 221 Reading Politics: Class and Ideology**

★3 (fi 6) (either term, 3-0-0). An introduction to dynamics of class and ideology

in literary and other cultural texts, and to the critical concepts and methods key to their study. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 222 Reading Politics: Race and Ethnicity**

★3 (fi 6) (either term, 3-0-0). An introduction to dynamics of race and ethnicity in literary and other cultural texts, and to the critical concepts and methods key to their study. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 223 Reading Politics: Empire and the Postcolonial**

★3 (fi 6) (either term, 3-0-0). An introduction to dynamics of colonization and its resistances in literary and other cultural texts, and to the critical concepts and methods key to their study. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 224 The Literary Institution**

★3 (fi 6) (either term, 3-0-0). An introduction to theories of the literary institution and to the issues and debates surrounding literary criticism as a social and political practice that takes place within the horizon of history and under certain systemic constraints. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 299 Essay Writing for Education Students**

★3 (fi 6) (either term, 3-0-0). This course, designed to increase the student's ability to write effective essays, emphasizes the study of grammar, punctuation, and sentence and paragraph structure. The study of models of prose style is integrated with frequent practice in writing. ENGL 299 is not a remedial course. Note: Restricted to students in the Faculty of Education; not to be taken by students with credit in WRITE 298, 398 or 498. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 300 Social and Cultural History of the English Language**

★3 (fi 6) (either term, 3-0-0). Studies in the historical development of the English Language. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101. Note: not to be taken by students with credit in former ENGL 311.

**ENGL 301 Social and Cultural History of Genre**

★3 (fi 6) (either term, 3-0-0). Studies in the theory and practice of genre. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 302 Literary and Cultural Theories**

★3 (fi 6) (either term, 3-0-0). Studies in critical and theoretical currents within literary studies. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 303 Computing Technology and Culture: Cyberculture**

★3 (fi 6) (either term, 3-0-0). Studies in cyberculture as a theoretical concept and a literary practice. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 304 Computing Technology and Culture: Literary Computing**

★3 (fi 6) (either term, 3-0-0). Studies in new media texts and the literary applications of computing. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 305 Literature and Religion**

★3 (fi 6) (either term, 3-0-0). Studies in selected texts, movements, and traditions that reflect the interaction of religion with literature and culture. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 308 Aboriginal/Indigenous Literature: Intellectual Traditions**

★3 (fi 6) (either term, 3-0-0). Studies of the contributions of the First Nations, Métis and American Indian writers to the formation of Aboriginal/Indigenous intellectual and community traditions. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 309 Aboriginal/Indigenous Literature: Literary Movements**

★3 (fi 6) (either term, 3-0-0). Studies in the literary and cultural currents within Aboriginal/Indigenous writing. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 312 Postcolonial Literature and Culture: African Writing in English**

★3 (fi 6) (either term, 3-0-0). Selected works from the African context. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 314 Postcolonial Literature and Culture: Irish Writing in English**

★3 (fi 6) (either term, 3-0-0). Selected works from the Irish context. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 315 Postcolonial Literature and Culture: Indian Writing in English**

★3 (fi 6) (either term, 3-0-0). Selected works from the Indian context. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 316 Postcolonial Literature and Culture: Middle-Eastern Writing in English**

★3 (*fi 6*) (either term, 3-0-0). Selected works from the Middle-Eastern context. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 320 Old English Language and Literature**

★6 (*fi 12*) (two term, 3-0-0). Studies in the language and literature of Anglo-Saxon England. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 324 Medieval Literature and Culture: Chaucer**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 325 Medieval Literature and Culture: Medieval Texts**

★3 (*fi 6*) (either term, 3-0-0). Selected works from the English context, 13th to 15th century. Note: not to be taken by students with credit in the former ENGL 321 or 322. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 327 Medieval Literature and Culture: Medieval and Tudor Drama**

★3 (*fi 6*) (either term, 3-0-0). Selected dramatic works from the English context, 13th to 16th century. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 336 Early Modern Literature and Culture: 16th-Century Texts**

★3 (*fi 6*) (either term, 3-0-0). Selected works from the English context. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 337 Early Modern Literature and Culture: Drama**

★3 (*fi 6*) (either term, 3-0-0). Selected dramatic works from the English context, 16th and 17th centuries. Prerequisite: ★6 of junior English.

**ENGL 338 Early Modern Literature and Culture: Shakespeare**

★6 (*fi 12*) (two term, 3-0-0). Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101. Note: Not to be taken by students with credit in ENGL 239 or 339.

**ENGL 339 Early Modern Literature and Culture: Studies in Shakespeare**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101. Note: Not to be taken by students with credit in ENGL 338.

**ENGL 340 Early Modern Literature and Culture: 17th-Century Texts**

★3 (*fi 6*) (either term, 3-0-0). Selected works from the English context. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 341 Restoration and 18th-Century Literature and Culture: Restoration and Early 18th-Century Texts**

★3 (*fi 6*) (either term, 3-0-0). Selected works from the British context, 1660 to 1750. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 343 Restoration and 18th-Century Literature and Culture: Late 18th-Century Texts**

★3 (*fi 6*) (either term, 3-0-0). Selected works from the British context, 1740 to 1800. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 344 Early Modern Literature and Culture: Milton**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101. Note: Not to be taken by students with credit in ENGL 340.

**ENGL 347 Restoration and 18th-Century Literature and Culture: Drama**

★3 (*fi 6*) (either term, 3-0-0). Selected dramatic works from the British context, 1660 to 1800. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 348 Restoration and 18th-Century Literature and Culture: The Novel**

★3 (*fi 6*) (either term, 3-0-0). Selected prose fiction from the British context, 1660 to 1800. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 349 19th-Century British Literature and Culture: The Novel**

★3 (*fi 6*) (either term, 3-0-0). Selected novels from the British context, 1800 to 1900. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 350 19th-Century British Literature and Culture: Romantic Texts**

★3 (*fi 6*) (either term, 3-0-0). Selected works from the British context, 1789 to 1830. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101. Note: Not to be taken by students with credit in ENGL 351.

**ENGL 352 19th-Century British Literature and Culture: Early Victorian Texts**

★3 (*fi 6*) (either term, 3-0-0). Selected works from the British context, 1830 to 1870. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 353 19th-Century British Literature and Culture: Late Victorian Texts**

★3 (*fi 6*) (either term, 3-0-0). Selected works from the British context, 1870 to 1900. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 354 Pre-20th-Century Transnational Literature and Culture**

★3 (*fi 6*) (either term, 3-0-0). Studies in literary and cultural currents before 1900 that resist or exceed national definition. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 355 American Literature and Culture: American Minority Literature**

★3 (*fi 6*) (either term, 3-0-0). Selected works by minority writers in America. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 356 American Literature and Culture: Reading American Technologies**

★3 (*fi 6*) (either term, 3-0-0). Studies in issues and problems of technology in works from the American context. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 357 American Literature and Culture: Reading American Ideologies**

★3 (*fi 6*) (either term, 3-0-0). Studies in issues and problems of ideology in works from the American context. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 358 American Literature and Culture: Early American Writing-Colonial, Revolutionary, Antebellum**

★3 (*fi 6*) (either term, 3-0-0). Selected works from the American context, first contact to 1865. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 359 American Literature and Culture: Reading American Origins**

★3 (*fi 6*) (either term, 3-0-0). Studies in issues and problems of origination in works from the American context. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 360 American Literature and Culture: Race and Belonging in American Writing**

★3 (*fi 6*) (either term, 3-0-0). Studies in issues and problems of racialization in works from the American context. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 361 American Literature and Culture: The American Modern - Postbellum and Early 20th Century**

★3 (*fi 6*) (either term, 3-0-0). Selected works from the American context, 1865 to 1945. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 362 American Literature and Culture: Toward the Now - Later 20th and Early 21st Century**

★3 (*fi 6*) (either term, 3-0-0). Selected works from the American context, 1945 to the present. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 363 Early 20th-Century Literature and Culture: Modernism and Modernity**

★3 (*fi 6*) (either term, 3-0-0). Studies in high, low and late modernism, and the international avant-garde to mid-century. Note: not to be taken by students with credit in former ENGL 370. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 364 Late 20th-Century Literature and Culture: Modernism and Modernity**

★3 (*fi 6*) (either term, 3-0-0). Studies in post-modernism and the international avant-garde since mid-century. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 365 Early 20th-Century British Literature and Culture**

★3 (*fi 6*) (either term, 3-0-0). Selected works from the British context to mid-century. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101. Note: not to be taken by students with credit in ENGL 370.

**ENGL 366 Late 20th-Century British Literature and Culture**

★3 (*fi 6*) (either term, 3-0-0). Selected works from the British context since mid-century. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 367 Contemporary Literature and Culture**

★3 (*fi 6*) (either term, 3-0-0). Selected works from the contemporary context. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 368 Early 20th-Century Literature and Culture: Drama**

★3 (*fi 6*) (either term, 3-0-0). Selected dramatic works in English to mid-century. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 369 Late 20th-Century Literature and Culture: Drama**

★3 (*fi 6*) (either term, 3-0-0). Selected dramatic works in English since mid-century. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 373 Canadian Literature and Culture: Writing and Colonization**

★3 (*fi 6*) (either term, 3-0-0). Selected works from the Canadian context, first contact to 1900. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101. Note: not to be taken by students with credit in ENGL 371.

**ENGL 374 Canadian Literature and Culture: Early 20th-Century Texts**

★3 (fi 6) (either term, 3-0-0). Selected works from the Canadian context to mid-century. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101. Note: Not to be taken by students with credit in ENGL 372.

**ENGL 375 Canadian Literature and Culture: Reading Canadian Cultures**

★3 (fi 6) (either term, 3-0-0). Studies in the cultural politics of representation in Canadian texts. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 376 Canadian Literature and Culture: Late 20th-Century Texts**

★3 (fi 6) (either term, 3-0-0). Selected works from the Canadian context since mid-century. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101. Note: not to be taken by students with credit in ENGL 372.

**ENGL 377 Canadian Literature and Culture: Canadian Drama and Performance**

★3 (fi 6) (either term, 3-0-0). Selected works by Canadian dramatists and performance artists. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 378 Canadian Literature and Culture: Contemporary Cultural Texts**

★3 (fi 6) (either term, 3-0-0). Selected works from the contemporary Canadian context. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 379 Canadian Literature and Culture: Canadian Minority Literature**

★3 (fi 6) (either term, 3-0-0). Selected works by minority writers in Canada. Content and period focus may vary. Prerequisite: ★6 of junior English.

**ENGL 380 Canadian Literature and Culture: Reading the Local**

★3 (fi 6) (either term, 3-0-0). Studies in regional writing in Canada. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 384 Popular Culture: Reading Popular Texts**

★3 (fi 6) (either term, 3-0-0). Studies in the popular tradition. Content and period focus may vary. Note: not to be taken by students with credit in the former ENGL 383. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 385 Popular Culture: Issues in Popular Culture**

★3 (fi 6) (either term, 3-0-0). The theory and practice of popular culture studies. Content and period focus may vary. Note: not to be taken by students with credit in the former ENGL 383. ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 386 Popular Culture: Working-Class Texts and Cultures**

★3 (fi 6) (either term, 3-0-0). Studies in spoken and written forms of working-class cultures. Content and period focus may vary. Note: not to be taken by students with credit in the former ENGL 383. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 388 Children's Literature and Culture: Oral Traditions**

★3 (fi 6) (either term, 3-0-0). Studies in texts from oral traditions, their modern derivatives, and historical, critical and theoretical approaches to oral texts. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 389 Children's Literature and Culture: Print Traditions**

★3 (fi 6) (either term, 3-0-0). Studies in texts from the print traditions, including picture books, historical, critical and theoretical approaches to print texts. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 390 Women's Writing: Writing by Women pre-1900**

★3 (fi 6) (either term, 3-0-0). Selected works by women writers in English before the twentieth century. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101. Note: Not to be taken by students with credit in former ENGL 390.

**ENGL 391 Women's Writing: Writing by Women Post-1900**

★3 (fi 6) (either term, 3-0-0). Selected works by women writers in English since 1900. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101. Note: not to be taken by students with credit in ENGL 391 Writing by Women II.

**ENGL 392 Queer Writing**

★3 (fi 6) (either term, 3-0-0). Studies in the movements, literatures, and cultures of sexual minorities, including gay, lesbian, bisexual and transgendered people. Content and period focus may vary. Prerequisite: ★6 of junior English, or ★3 of junior English plus WRS 101.

**ENGL 401 Studies in Authors**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★6 of junior English or ★3 of junior English plus WRS 101; and ★12 of senior-level English ★6 of which must be at the 300 level. Note: variable content course which may be repeated.

**ENGL 402 Studies in Genres**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★6 of junior English or ★3 of junior

English plus WRS 101; and ★12 of senior-level English, ★6 of which must be at the 300 level. Note: variable content course which may be repeated.

**ENGL 405 Studies in Poetry**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★6 of junior English or ★3 of junior English plus WRS 101; and ★12 of senior-level English, ★6 of which must be at the 300 level. Note: variable content course which may be repeated.

**ENGL 407 Studies in Texts and Cultures**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★6 of junior English or ★3 of junior English plus WRS 101; and ★12 of senior-level English, ★6 of which must be at the 300 level. Note: variable content course which may be repeated.

**ENGL 408 Studies in Comparative Literatures in English**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★6 of junior English or ★3 of junior English plus WRS 101; and ★12 of senior-level English, ★6 of which must be at the 300 level. Note: variable content course which may be repeated.

**ENGL 409 Studies in Literary Periods and Cultural Movements**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★6 of junior English or ★3 of junior English plus WRS 101; and ★12 of senior-level English, ★6 of which must be at the 300 level. Note: variable content course which may be repeated.

**ENGL 424 Studies in the History of Books**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★6 of junior English or ★3 of junior English plus WRS 101; and ★12 of senior-level English, ★6 of which must be at the 300 level. Note: variable content course which may be repeated.

**ENGL 425 Studies in the History of Reading**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★6 of junior English or ★3 of junior English plus WRS 101; and ★12 of senior-level English, ★6 of which must be at the 300 level. Note: variable content course which may be repeated.

**ENGL 426 Studies in Literary and Cultural Histories**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★6 of junior English or ★3 of junior English plus WRS 101; and ★12 of senior-level English, ★6 of which must be at the 300 level. Note: variable content course which may be repeated.

**ENGL 430 Studies in Theory**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★6 of junior English or ★3 of junior English plus WRS 101; and ★12 of senior-level English, ★6 of which must be at the 300 level. Note: variable content course which may be repeated.

**ENGL 465 Studies in Gender and Sexualities**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★6 of junior English or ★3 of junior English plus WRS 101; and ★12 of senior-level English, ★6 of which must be at the 300 level. Note: variable content course which may be repeated.

**ENGL 467 Studies in Race and Ethnicity**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★6 of junior English or ★3 of junior English plus WRS 101; and ★12 of senior-level English, ★6 of which must be at the 300 level. Note: variable content course which may be repeated.

**ENGL 481 Studies in Empire and the Postcolonial**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★6 of junior English or ★3 of junior English plus WRS 101; and ★12 of senior-level English, ★6 of which must be at the 300 level. Note: variable content course which may be repeated.

**ENGL 482 Studies in Drama and Performance**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★6 of junior English or ★3 of junior English plus WRS 101; and ★12 of senior-level English, ★6 of which must be at the 300 level. Note: variable content course which may be repeated.

**ENGL 483 Studies in Popular Culture**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★6 of junior English or ★3 of junior English plus WRS 101; and ★12 of senior-level English ★6 of which must be at the 300 level. Note: variable content course which may be repeated.

**ENGL 484 Studies in Literature and Film**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★6 of junior English or ★3 of junior English plus WRS 101; and ★12 of senior-level English, ★6 of which must be at the 300 level. Note: variable content course which may be repeated.

**ENGL 486 Studies in Computer Technologies and Culture**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★6 of junior English or ★3 of junior English plus WRS 101; and ★12 of senior-level English, ★6 of which must be at the 300 level. Note: variable content course which may be repeated.

**ENGL 487 Studies in Children's Literature**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★6 of junior English or ★3 of junior English plus WRS 101; and ★12 of senior-level English, ★6 of which must be at the 300 level. Note: variable content course which may be repeated.

**ENGL 489 Studies in Emergent Cultures and Minority Texts**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★6 of junior English or ★3 of junior English plus WRS 101; and ★12 of senior-level English, ★6 of which must be at the 300 level. Note: variable content course which may be repeated.

**ENGL 498 Honors Essay**

★3 (fi 6) (second term, 0-3s-0). Required of all Honors students. In the first term



of the final year, the Advisor will organize a prefatory meeting for the second term course. Students will be required to participate in a peer workshop and consult with a faculty member on their essay in the second term.

#### **ENGL 499 Cooperative Work Experience Seminar**

★3 (fi 6) (first term, 0-3s-0). Required of all students returning to the university campus following completion of their Cooperative Education work term placement. The course will involve completion and defense of an applied research project based on the work term placement as well as discussion of related issues. Note: this course does not apply to the 400-level requirements for English programs. Prerequisites: WKEXP 801, 802, and 803.

#### **ENGL 532 Tutorial: Fourth-Year Honors English**

★3 (fi 6) (either term, variable). In the third year of the program, the Honors student, in consultation with the Department, arranges for a literary project to be pursued under the guidance of a member of the Department for one term. The project involves study of some problems having to do with such matters as technique, genre, criticism, or theme.

#### **ENGL 533 Directed Reading in Fourth-Year Honors English**

★3 (fi 6) (either term, 3-0-0). Note: Students may take this directed-reading course no more than once during their program.

## Graduate Courses

Selected courses from the following list will be offered each year. Details of each year's program may be obtained early in the preceding spring from the Department.

#### **ENGL 553 Directed Reading**

★6 (fi 12) (two term, 3-0-0).

#### **ENGL 554 Directed Reading**

★3 (fi 6) (first term, 3-0-0).

#### **ENGL 555 Directed Reading**

★3 (fi 6) (second term, 3-0-0).

#### **ENGL 567 Studies in Literary History**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 569 Studies in Literary Criticism**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 577 Studies in the English Language**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 586 Studies in American Literature**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 591 Studies in Canadian Literature**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 611 Studies in Old English Literature**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 615 Studies in Middle-English Literature**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 635 Studies in Renaissance Literature**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 647 Studies in 17th-Century Literature**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 659 Studies in Restoration and 18th-Century Literature**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 665 Studies in Romantic Literature**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 673 Studies in Victorian Literature**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 679 Studies in 20th-Century Literature**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 680 Studies in Post-Colonial Literature in English**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 687 Studies in Children's Literature**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 693 Studies in Literary Genres**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 694 Studies in Literary Techniques**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 695 Studies in Literary Themes**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 696 Studies in Individual Authors**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 800 PhD Colloquium**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 801 PhD Colloquium**

★3 (fi 6) (either term, 3-0-0).

#### **ENGL 900 Directed Research Project**

★3 (fi 6) (either term, unassigned).

## 231.125 English as a Second Language, ESL

Faculty of Extension

### Undergraduate Courses

#### **ESL 140 English for Academic Purposes Part I**

★3 (fi 19) (either term, 132 hours). This course in English for Academic Purposes (EAP) provides advanced ESL students with the opportunity to improve their academic listening, speaking, reading and writing skills. Upon completion of ESL 140, students are able to analyze academic materials critically and to express themselves fluently, accurately and logically, both orally and in writing. Classes are scheduled three times a week for the entire term, except in Spring and Summer terms when classes are scheduled four times a week. Prerequisites: Minimum scores of 70 on TOEFL iBT (530 on TOEFL paper-based) or appropriate cut-off scores for other standardized academic proficiency tests recognized by the Office of the Registrar and Student Awards. Offered four times a year.

#### **ESL 145 English for Academic Purposes Part II**

★3 (fi 19) (either term, 132 hours). This EAP course is a continuation of ESL 140. Students further develop their abilities to collect and synthesize information from a variety of academic sources; analyze and critique materials; and present their ideas in a variety of media in accordance with the academic standards found at the first-year university level. ESL 140 and 145 thoroughly prepare students for study at the undergraduate university level. Classes are scheduled three times a week for the entire term, except in Spring and Summer terms when classes are scheduled four times a week. Prerequisite: ESL 140. Offered four times a year.

#### **ESL 550 Preparing for Graduate Studies**

★6 (fi 15) (either term, 360 hours). This 360-hour course enables students whose first language is other than English to develop the academic and social communication skills necessary to function effectively and independently at the graduate level at the University of Alberta. In addition to an English-language component, the course contains a cultural component which deals with such aspects as cultural awareness and values, differences in approaches to teaching and learning, orientation to campus and campus life, etiquette, behavior, and acculturation difficulties. This course is open to students who have received recommendations for preliminary admission to the Faculty of Graduate Studies and Research (FGSR). Prerequisite: consent of FGSR. Scheduled four times a year.

## 231.126 Entomology (Biological Sciences), ENT

Department of Biological Sciences  
Faculty of Science

### Notes

- See the following sections for listings of other Biological Sciences courses: Bioinformatics (BIOIN); Biology (BIOL); Botany (BOT); Genetic (GENET); Microbiology (MICRB); Zoology (ZOO).
- See the following sections for listings of other relevant courses: Interdisciplinary Studies (INT D); Immunology and Infection (IMIN); Marine Science (MA SC); Paleontology (PALEO).

### Undergraduate Courses

#### **0 ENT 207 Agricultural Entomology**

★3 (fi 6) (second term, 3-0-3). Introduction to insects and related arthropods emphasizing those aspects of their structure and life history responsible for some of them becoming pests and indicating those aspects towards which control measures can be directed. Principles of integrated control. Prerequisite: One of BIOL 107 or 108 or SCI 100.

#### **0 ENT 220 Insect Biology**

★3 (fi 6) (first term, 3-0-3). An introduction to the evolution, diversity, phylogeny, life styles, distribution, and classification of hexapods and practical experience in their identification. Prerequisite: BIOL 108 or SCI 100.

#### **0 ENT 321 Insect Physiology**

★3 (fi 6) (either term, 3-0-0). Biochemical and physiological adaptations that have allowed insects and their relatives to become extremely successful in most habitats, ways in which insect functions differ from those of other animals, and use of insect models for general physiological and biochemical research. Prerequisites: BIOL 107 or SCI 100 and ENT 220.

**O ENT 378 Insect Pathology**

★3 (*fi 6*) (first term, 3-0-0). An introduction to the diseases of insects and related arthropods. The use of insect pathogens to reduce pest damage in forestry and agriculture. Roles of diseases in insect population dynamics, Biotechnology and insect pathogens. Prerequisite: ★3 in Entomology or Microbiology. Not open to first-year students.

**O ENT 380 Forest Entomology**

★3 (*fi 6*) (second term, 3-0-3). Characteristics of major North American forest insects. Roles of insects in forest ecosystems. Roles of insects in forest ecosystems. Insects destructive to wood and wood products. Principles of control. Prerequisite: BIOL 208. Course jointly offered by the Departments of Biological Sciences and Renewable Resources. Note: Credit may not be obtained for both ENT 280 and 380.

**O ENT 392 Medical and Veterinary Entomology**

★3 (*fi 6*) (second term, 3-0-0). An account of the influence of the arthropods on the health of man and domestic animals, and the interactions between arthropod vectors and vertebrate pathogens. Prerequisite: any Entomology course or consent of instructor.

**O ENT 401 Current Topics in Arthropod Biology**

★3 (*fi 6*) (either term, 0-3s-0). Survey, discussion and analysis of current literature in selected areas of arthropod biology of interest to advanced undergraduates. Prerequisite: ZOOL 250 or an ENT course or consent of instructor. Credit may be obtained more than once. Offered in alternate years.

**O ENT 427 Terrestrial Arthropod Diversity**

★3 (*fi 6*) (first term, 3-0-3). Evolution, distribution, and classification of terrestrial arthropods, with emphasis on hexapods. Students practice identification using museum collections, build keys and databases, and make a substantive collection of regional insects. Prerequisite: Any one of ENT 207, 220, 380, or ZOOL 351; BIOL 335 recommended. Credit cannot be obtained for both ENT 427 and 527.

**Graduate Courses****Notes**

- (1) All 300- and 400-level courses in the Department of Biological Sciences may be taken for credit (except for BIOL 490, 498 and 499) by graduate students with approval of the student's supervisor or supervisory committee.
- (2) The following courses may be taken as an option in graduate programs in the Department of Biological Sciences with approval of the student's supervisor or supervisory committee: BIOCH 510, 520, 530, 541, 550, 555, 560; CHEM 361, 363, 461; CELL 300, 301; ENCS 510; IMIN 371, 372, 452, 501; MA SC 400, 401, 402, 410, 412, 420, 425, 430, 437, 440, 445, 470, 480; MMI 405, 415, 520; NEURO 472; NU FS 363; PALEO 418, 419; PHARM 601.

**ENT 501 Advanced Current Topics in Arthropod Biology**

★3 (*fi 6*) (either term, 0-3s-0). Survey, discussion and analysis of current literature in selected areas of arthropod biology of interest to graduate students in Biological Sciences. Discussions are the same as for ENT 401, but with additional assignments and evaluation appropriate to graduate studies. Prerequisite: Consent of instructor. Credit may be obtained more than once. Offered in alternate years.

**ENT 527 Advanced Terrestrial Arthropod Diversity**

★3 (*fi 6*) (first term, 3-0-3). Evolution, distribution, and classification of terrestrial arthropods, with emphasis on hexapods. Students practice identification using museum collections, build keys and databases, and make a substantive collection of regional insects. Lectures and labs are the same as for ENT 427, but with additional assignments and evaluation appropriate to graduate studies. Prerequisite: Consent of instructor. Credit cannot be obtained for both ENT 427 and 527.

**ENT 601 Entomology Seminar**

★1 (*fi 2*) (first term, 0-2s-0). A forum for those with an interest in insects. Presentations may be provided by students, faculty, invited speakers and visiting scientists.

**ENT 602 Entomology Seminar**

★1 (*fi 2*) (second term, 0-2s-0). Presentations may be provided by students, faculty, invited speakers and visiting scientists. Each student enrolled for credit gives one seminar for evaluation. Questions and discussion follow; participation also requires written evaluations of each seminar by peers and one or more Faculty members.

**231.127 Environmental and Conservation Sciences, ENCS**

Departments of Agricultural, Food and Nutritional Science;  
Renewable Resources; Rural Economy  
Faculty of Agricultural, Life and Environmental Sciences

**Note:** See also Agricultural and Resource Economics (AREC), Animal Science (ANSC), Forest Economics (FOREC), Forest Engineering (FOREN), Forest Science (FOR), Plant Science (PL SC), Renewable Resources (REN R), and Soil Science (SOILS) listings for related courses.

The following courses were renumbered

Old	New
ENCS 308	ENCS 207
ENCS 207	REN R 299

**Undergraduate Courses****ENCS 201 Wildlife Biodiversity and Ecology**

★3 (*fi 6*) (second term, 3-0-3). Introduction to animals in the context of conservation, interactions with people, and roles in natural ecosystems. Labs provide a survey of North American animal life, both vertebrate and invertebrate, with emphasis on recognition of higher taxa and on hierarchical classification. Field trip. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. [Renewable Resources]

**ENCS 260 History and Fundamentals of Environmental Protection and Conservation**

★3 (*fi 6*) (second term, 3-0-0). A philosophical and sociological exploration of historical and contemporary perspectives on human-environmental relationships and their implications. Explores these perspectives in a framework of critical thinking and through case studies. [Renewable Resources]

**ENCS 271 The Politics of Food and Natural Resources**

★3 (*fi 6*) (either term, 3-0-0). Students will gain a sociological understanding of contemporary Canadian politics in the food and natural resources sectors. Examination of the nature of political organizations and policymaking in Canada; the particular roles played by the state, the "public," and certain sectors of civil society, including social movements, industry organizations, labour unions, scientific organizations, and rural and aboriginal peoples. Contemporary case studies may include climate change and energy dependence, genetic engineering in agribusiness, the organic food products movement, mining in the circumpolar north, forestry expansion in the boreal region and cod management in the Atlantic fisheries. No prerequisites. [Renewable Resources]

**ENCS 307 Environmental Assessment Principles and Methods**

★3 (*fi 6*) (second term, 3-0-0). Principles and elements of environmental assessment with an interdisciplinary focus. Topics include types of environmental assessments, when to use them, data required, sampling strategies, how data should be collected and analyzed and ultimately communicated to pass legal and scientific scrutiny. Prerequisites: ENCS 201, PL SC 221; REN R 250; SOILS 210; STAT 151; REN R 299; or equivalents. Consent of Instructor required for students outside the Faculty of Agricultural, Life and Environmental Sciences. [Renewable Resources]

**ENCS 352 Natural Resource and Environmental Law**

★3 (*fi 6*) (first term, 3-0-0). Overview of Canadian laws and policies designed to control air, land, and water pollution including licensing systems, quasi-criminal sanctions, and environmental impact assessment processes. The course will also review relevant constitutional issues and consider alternative legal approaches to the resolution of environmental problems. Prerequisite: Completion of ★60 of university-level course work. [Rural Economy]

**ENCS 355 Ecological Risk Assessment**

★3 (*fi 6*) (second term, 0-3s-0). Principles, concepts, processes and strategies for the assessment of adverse ecological effects that may occur as a result of exposure to physical, chemical or biological stressors that can induce change in organisms. Topics include procedures for conducting ecological risk assessments, their integration with human health risk assessment, and current frameworks employed in Canada and elsewhere. [Rural Economy]

**ENCS 356 Principles of Rangeland Conservation and Habitat Management**

★3 (*fi 6*) (first term, 3-0-3). An introduction to rangeland conservation and wildlife habitat management. Examines the effects of grazing and browsing on ecosystems components, including rangeland soils, plants, plant communities, and landscapes. Discusses interactions among herbivores including livestock and wildlife. Reviews practical management activities such as rangeland inventory, improvements, planning, and condition assessment. Prerequisite: ★3 in university-level biology. [Agricultural, Food and Nutritional Science]

**ENCS 360 Soil and Water Conservation**

★3 (*fi 6*) (second term, 3-0-0). Global soil and water resources and their current rates of degradation. The main processes of degradation (erosion, loss of organic matter, salinization, pollution) and their causes. Consequences of degradation and conservation of resources through improved land use practices. Prerequisites: SOILS 210; and ENCS 203 or REN R 250. [Renewable Resources]

**ENCS 364 Principles of Managing Natural Diversity**

★3 (*fi 6*) (second term, 3-1s-0). Introduction to the theoretical foundation for conservation science. Elements of population, community and landscape ecology will be reviewed, and their application to real-world challenges discussed. Objective is to provide students with the scientific tools to evaluate and develop conservation strategies for maintaining diversity in human-altered systems. Ethical and philosophical aspects of the socio-political arena in which conservation decisions are made and implemented are also explored. Prerequisites: BIOL 208

or (BIOL 108 and REN R 110) and ★60 of university-level coursework. Credit will not be given for both ENCS 364 and either BIOL 367 or 467. This course has limited enrolment, with preference given to students in the ENCS, Conservation Biology and Management Program. [Renewable Resources] Sections may be offered in a Cost Recovery format at an increased rate of fee assessment; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **L** ENCS 376 Wildlife Productivity and Management

★3 (fi 6) (first term, 3-0-3). Principles of animal function as applied to management of wildlife communities. Special emphasis on nutritional ecology of hoofed mammals and trophic dynamics of grazing systems. Field trips. Prerequisite: ★3 in university-level Biology. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. [Renewable Resources]

#### **O** ENCS 406 Rangeland Plant Communities of Western Canada

★3 (fi 6) (second term, 3-0-3). Examines major rangeland plant communities and their physical environments in western Canada, including individual plant identification and ecology. Includes a review of various land uses such as livestock and wildlife grazing within these communities, their response to disturbances such as herbivory and fire, and other management considerations. Graduate students may not register for credit (see AFNS 506). Credit will only be given for one of AFNS 506 and ENCS 406. Prerequisite: one of ENCS 356, REN R 120 or BOT 210; ENCS 356 strongly recommended. [Agricultural, Food and Nutritional Science ]

#### **O** ENCS 407 Rangeland Plant Communities of North America

★3 (fi 6) (first term, 1-0-5). An in-depth study of the plants and communities of North American rangelands and wildland ecosystems, and their management. Prerequisites: ENCS 356; ENCS 406 strongly recommended. [Agricultural, Food and Nutritional Science]

#### **L** ENCS 455 Soil Remediation

★3 (fi 6) (first term, 3-3s-0). Principles and methods of biological, chemical, and physical remediation of soils contaminated by hazardous chemicals and other pollutants. Topics include bioremediation of hydrocarbon contaminated soils; chemical restoration of heavy metal polluted soils, acid soils and mine spoils, and salt-affected soils; physical and biological restoration of compacted soils and hydrophobic soils contaminated with organic compounds or wastes; and risk analysis and soil quality criteria in soil remediation. Prerequisites: At least ★75 university credit with emphasis on biophysical courses, and SOILS 430 recommended. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. [Renewable Resources]

#### **L** ENCS 461 Climates and Ecosystems

★3 (fi 6) (first term, 3-0-2). The basic principles by which the cycles of water, carbon, and nutrients through soils, plants, and the atmosphere are controlled in terrestrial ecosystems under different climates. Interrelationships among water, carbon and nutrient cycles in natural and managed ecosystems that have developed in different climatic zones. Environmental consequences of human intervention in the cycles for food and fibre production in different ecosystems. Prerequisite: SOILS 210. Recommended courses: PL SC 221 or BOT 240. Credit may not be obtained in both ENCS 361 and 461. [Renewable Resources]

#### **L** ENCS 462 Protected Areas Planning and Management

★3 (fi 6) (first term, 3-0-0). Principles and practices of planning and management of protected areas, including national and provincial parks and forest recreational systems; wilderness management; the integration of biological and sociological criteria in protected areas planning and management. Prerequisites: ENCS 260 and 364. [Renewable Resources]

#### **L** ENCS 464 Conservation and Management of Endangered Species

★3 (fi 6) (first term, 3-0-0). Theoretical and applied considerations for maintaining endangered, threatened and rare populations and species, including provincial, national and international strategies. Contributory factors to decline and extinction are discussed, as are various recovery programs. Prerequisite: ENCS 364, or consent of Instructor. [Renewable Resources]

#### **O** ENCS 465 Environmental and Conservation Field Studies

★3 (fi 6) (either term or Spring/Summer, variable). Field trip studies with a focus on environmental and conservation biology topics. Course content and offerings vary from year to year, and have included study trips on Northern Ecosystems, National Parks, and Protected Areas, Arctic Tundra, the Florida Everglades, and Galapagos Islands. Prerequisite: ★9 in biological or ecological topics. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. [Renewable Resources]

#### **L** ENCS 467 Methods of Environmental Interpretation and Communication

★3 (fi 6) (second term, 3-0-0). Methods of communicating environmentally relevant subject matter to a broad audience. Includes discussion of guided walks, in-person presentations, brochures, visitor centers, exhibits, signs, magazine articles, books, video production, media relations skills, websites and ecotourism. [Renewable Resources]

#### **O** ENCS 471 Practical Case Studies in Rangeland Management and Conservation

★3 (fi 6) (first term, 3-0-3). Cumulative effects of fire, grazing, browsing, and improvement practices on the productivity and species composition of range and pasture ecosystems, including management implications. Extended field trip prior to the start of classes. Offered in alternate years commencing 2001-02. Graduate students may not register for credit (see AFNS 572). Credit will only be given for one of AFNS 572 and ENCS 471. Prerequisite: ENCS 356. ENCS 406 strongly recommended. [Agricultural, Food and Nutritional Science]

#### **ENCS 473 Environmental and Conservation Policy**

★3 (fi 6) (either term, 3-0-0). An overview of principles and programs relating to environmental and conservation policy. Selected local, national, and international environmental policy issues. Prerequisite: One of the following: AREC 200, FOREC 345, INT D 365, AREC 365, ECON 365, INT D 369 ECON 369. [Rural Economy]

#### **L** ENCS 474 Utilization of Wildlife Resources

★3 (fi 6) (first term, 3-0-1). Issues, principles and science surrounding sustainable use of wildlife resources. Hunting, angling and trapping for subsistence, recreational and commercial purposes. Sociopolitical dimensions of harvest regulation, wildlife administration, and human demographic changes. Field trips. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisite: minimum of ★6 of Renewable Resources or Biological Sciences courses at the 300-level or higher. [Renewable Resources]

#### **L** ENCS 475 Waste Management and Utilization

★3 (fi 6) (second term, 3-3s-0). Chemical, biological, and physical properties of anthropogenic wastes, their reactions in the soil environment, theory and practice for their chemical and biological immobilization and use in agriculture, forest, and urban lands. Prerequisites: consent of Instructor, must have completed at least ★60 at the university-level. [Renewable Resources]

#### **L** ENCS 476 Dynamics of Wildlife and Rangeland Ecosystems

★3 (fi 6) (second term, 3-0-3). Plant-herbivore interactions and grazing systems management. Systems analysis, simulation modelling, expert systems, and other computer applications in wildlife and range management. Prerequisites: ★60 at the university level with at least ★6 in Biology or Ecology. [Renewable Resources]

## Graduate Courses

**Note:** 400-level courses listed under ENCS, FOR, INT D, REN R or SOILS and offered by the Department of Renewable Resources may be taken for graduate credit under certain circumstances. (See 205.67.1).

#### **L** ENCS 510 Wetland Resource Management

★3 (fi 6) (second term, 0-3s-0). An in-depth, seminar treatment of wetland ecology principles supplemented with student led discussion of wetland issues, management and current research drawn from local, regional and international sources. The course objective is to apply ecological bases of wetland ecology to understanding, developing and critiquing wetland management prescriptions. Prerequisite: consent of Instructor. [Renewable Resources]

#### **ENCS 673 Environmental and Conservation Policy**

★3 (fi 6) (either term, 3-0-0). An overview of principles and programs relating to environmental and conservation policy. Selected local, national, and international environmental policy issues. Prerequisite: One of the following: AREC 200, FOREC 345, INT D 365, AREC 365, ECON 365, INT D 369, ECON 369. Not available for students with credit in ENCS 473. Available only to students in MBA/MAG, MBA/MF, MBA in Natural Resource and Energy Programs, or by consent of Department. [Rural Economy]

## 231.128 Environmental Engineering, ENV E

Department of Civil and Environmental Engineering  
Faculty of Engineering

The following courses were renumbered effective 2001-02:

Old	New
ENV E 402	ENV E 302
ENV E 422	ENV E 322

## Undergraduate Courses

#### **ENV E 220 Environmental Chemistry for Engineering**

★3.8 (fi 6) (either term, 3-0-3/2). Survey of basic principles in analytical, inorganic, and organic chemistry with emphasis on environmental engineering applications. Laboratory measurements related to water quality. Prerequisite: CHEM 105.

#### **ENV E 222 Chemical and Physical Processes**

★3.8 (fi 6) (either term, 3-0-3/2). Theory of chemical and physical processes in environmental engineering. Chemical kinetics and equilibrium, reactor design, sedimentation, filtration, adsorption, precipitation and gas transfer. Prerequisite: ENV E 220.



**ENV E 302 Environmental Impact Assessment**

★2.5 (fi 6) (either term, 2-1s-0). Need and objectives of environmental impact assessment (EIA). Basic tasks and methods for need justification, project description, environmental factor determination, impact prediction, significance testing, mitigation design, evaluation, reporting, and public review. Review of impacts of different types of engineering projects and activities. Either Prerequisite: ENV E 222 or Corequisite: MIN E 413.

**ENV E 320 Environmental Hydrology**

★3.8 (fi 6) (either term, 3-0-3/2). Introduction to concepts in hydrology and hydrogeology. Hydrology topics include precipitation, evaporation, infiltration, streamflow, and hydrograph analysis. Hydrogeology topics include infiltration, percolation, seepage, drainage, aquifer hydraulics, and urban runoff quality. Prerequisite: CIV E 330; Corequisite: CIV E 331.

**ENV E 322 Environmental Protection**

★3 (fi 6) (either term, 3-0-0). Principles and methods of environmental protection for the engineering profession. Choice of technology, design of engineering projects, emission controls, mitigation and monitoring, environmental management plans. Federal and provincial environment legislation, professional engineering codes. Environmental policies and their effects on engineering design. Environmental management plans and issues. Prerequisite: ENV E 220.

**ENV E 323 Principles of Air Quality Management and Control**

★3 (fi 6) (first term, 3-0-0). A first course on air quality and air pollution, dealing with: types of gaseous and particulate pollutants and their sources, effects of air pollution on man, vegetation, and materials, indoor air pollution, sampling and analysis of air pollutants, air pollution meteorology and dispersion, control techniques for gaseous and particulate pollutants, and air quality management aspects. Prerequisite: ENV E 222.

**ENV E 324 Biological Processes**

★3.8 (fi 6) (second term, 3-0-3/2). The application of biological processes in the treatment of water, wastewater and solid wastes. Includes development of microorganism growth and substrate use models, treatment process theory, pre-design of unit processes and operations. Lectures cover aerobic, facultative and anaerobic processes in suspended and attached growth system. Prerequisite: ENV E 222.

**ENV E 351 Properties of Environmental Engineering Materials**

★3.8 (fi 6) (either term, 3-0-3/2). Study of materials used in environmental engineering including traditional engineering materials such as soil and rock, concrete, steel, and wood but extending the coverage to man made materials such as plastics, textiles, membranes, composites, resins, and polymers. Prerequisite: EAS 210 and CIV E 270. Corequisite: CIV E 290.

**ENV E 400 Advanced Environmental Engineering I**

★3 (fi 6) (first term, 3-0-0). Industrial waste management, or hazardous waste management, or air pollution, or soil/groundwater pollution, etc. Prerequisite: ENV E 222; corequisite: ENV E 322.

**ENV E 401 Advanced Environmental Engineering II**

★3 (fi 6) (either term, 3-0-0). Application of advanced treatment processes in air, water and solid systems. Will include development of membrane biological reactor designs, advanced oxidation processes, soil/sediment and hazardous waste remediation techniques, odour reduction and leachate treatment processes. Prerequisite: ENV E 324.

**ENV E 421 Municipal Systems**

★3.8 (fi 6) (either term, 3-0-3/2). Detailed and advanced design of water supply systems, sewerage, and storm drains. Rates of flow and hydraulics of networks and sewers, rainfall-runoff analysis, storm water storage, and loads on conduits. Extensive computer simulation of systems. Prerequisites: CIV E 331.

**ENV E 432 Solid Waste Management**

★3 (fi 6) (either term, 3-0-0). Principles of solid waste management to protect public health. Study of solid waste components, refuse collection, storage, and handling. Design and operation of solid waste transfer and disposal facilities including transfer stations, resource recovery and composting facilities, incinerators, and landfills. Prerequisites: ENV E 324 and 351.

**ENV E 434 Environmental Geotechnics**

★3 (fi 6) (either term, 3-0-0). Design of soil waste containment systems; stability of natural slopes, engineered cuts and embankments; earth pressure theories; design of retaining structures and pressures on buried pipes; settlement of earth containment structures and foundations; load-carrying capacity of foundations; design for filtration, separation, containment, and reinforcement using geosynthetics. Prerequisites: CIV E 381 and ENV E 351.

**ENV E 440 Facility Design**

★4.5 (fi 6) (either term, 3-0-3). Design and planning of water supply, water and wastewater treatment, storm water management, and solid waste facilities. Course includes major design projects, field trips, and presentations. Students work in teams on a design project. Prerequisites: ENV E 324, 421 and either 400 or 401.

**ENV E 471 Elements of Structural Design**

★3.8 (fi 6) (either term, 3-0-3/2). Structural design principles in steel and concrete

as applied to environmental engineering type structures such as pipes, tanks, beams, columns, slabs, and foundations. Prerequisite: CIV E 270.

**231.129 Espagnol, ESPA**

Faculté Saint-Jean

**Cours de 1er cycle****ESPA 100 Espagnol langue seconde**

★6 (fi 12) (aux deux semestres, 5-0-0). Études des éléments et des structures de base de l'espagnol parlé et écrit. Note: Ce cours se destine aux étudiants qui n'ont aucune connaissance de la langue espagnole. Il n'est pas accessible aux étudiants ayant ou postulants des crédits pour Spanish 35, SPAN 100 ou leurs équivalents. Priorité est donnée aux étudiants de la Faculté Saint-Jean.

**ESPA 200 Espagnol pour locuteurs francophones (cours intermédiaire I)**

★3 (fi 6) (l'un ou l'autre semestre, 4-0-0). Ce cours comprend les aspects suivants: développement intensif de la compréhension, correction phonétique, révision et renforcement des structures grammaticales, lectures et discussions de textes, capacité de rédaction. Le cours vise également à étudier les différents aspects de la culture et de la civilisation hispaniques. Ce cours s'adresse aux étudiants ayant des compétences en français. Préalable(s) : Spanish 30, ESPA 100 ou SPAN 111 et SPAN 112. Ce cours n'est pas accessible aux étudiants ayant suivi SPAN 211.

**ESPA 210 Espagnol pour locuteurs francophones (cours intermédiaire II)**

★3 (fi 6) (l'un ou l'autre semestre, 4-0-0). Ce cours est la suite du cours ESPA 200 et comprend les aspects suivants de façon plus approfondie: développement intensif de la compréhension, correction phonétique, révision et renforcement des structures grammaticales, lectures et discussions de textes, capacité de rédaction. Le cours vise également à étudier les différents aspects de la culture et de la civilisation hispaniques. Ce cours s'adresse aux étudiants ayant des compétences en français. Préalable(s) : ESPA 200 ou SPAN 211 ou l'équivalent. Ce cours n'est pas accessible aux étudiants ayant suivi SPAN 212.

**231.130 Etudes canadiennes, ETCAN**

Faculté Saint-Jean

Les cours M EDU sont réservés aux étudiants inscrits dans un programme de 2e ou de 3e cycle.

**Cours de 1er cycle****ETCAN 101 Introduction à l'étude du Canada**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Présente un survol de la vie au Canada dans sa spécificité, pouvant inclure les aspects artistique, culturel, politique, social, et économique; introduit au champ interdisciplinaire des Etudes canadiennes.

**ETCAN 330 Les francophonies canadiennes et acadiennes I : perspectives historiques et culturelles**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Les fondements et l'évolution des communautés francophones et acadiennes du Canada, du Régime français à aujourd'hui, par l'étude de textes littéraires, historiographiques et ethnologiques. Un aperçu de leurs traditions orales, de leurs pratiques culturelles et des rapports avec les cultures avoisinantes : Autochtones, Loyalistes, Irlandais, etc. Note : Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour ETCAN 322 et CA FR 320.

**ETCAN 332 Les francophonies canadiennes et acadiennes II : perspectives idéologiques et politiques.**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). La civilisation et la culture du Canada français et de l'Acadie, du Régime français à nos jours, par l'étude des idéologies politiques et des procédés juridiques régissant leur développement et leurs modes de communication collective. Le tatut ambivalent de majoritaire/minoritaire vu à travers le prisme du post-colonialisme et du multiculturalisme. Note : Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour ETCAN322 et CA FR 322.

**ETCAN 360 La question nationale au Canada**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Une étude des nationalismes canadien/Canadien, québécois et amérindiens, dans les traditions politiques, intellectuelles et artistiques du Canada. Préalable(s) : ★6 à sigle ETCAN ou à contenu canadien dans les disciplines suivantes: économie, histoire, science politique, sociologie; ou l'approbation du Vice-doyen aux affaires académiques.

**ETCAN 414 Littératures Canadiennes**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude d'oeuvres en littératures canadiennes (incluant roman, poésie, dramaturgie, etc.) d'expression française et d'expression anglaise. Contexte sociohistorique et signification pour les études sur le Canada.

**0 ETCAN 421 Langue et gouvernement au Canada**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Une étude de la diversité linguistique au Canada et de son impact sur les politiques et les institutions de gouvernement. Les thèmes comprennent le contact des langues, le maintien d'une langue, la mobilisation ethnique, les politiques linguistiques. Analyse approfondie de la législation en matière de langue et de l'utilisation des langues au sein des assemblées législatives, des fonctions publiques, des tribunaux et des écoles. Préalable(s): SC PO 225 ou 226 ou l'approbation du Vice-doyen aux affaires académiques.

**0 ETCAN 450 Enjeux canadiens actuels**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Un examen interdisciplinaire d'enjeux choisis dans les domaines culturel, économique, politique et social, auxquels le Canada fait actuellement face. Préalable(s): ★6 à contenu canadien de niveau 300 ou 400, dont au moins ★3 à sigle ETCAN.

**Cours de 2e cycle****0 ETCAN 500 Méthodologies interdisciplinaire et multidisciplinaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction à l'interdisciplinarité et à la multidisciplinarité comme méthodologies de recherche. Possibilités et limites de telles approches méthodologiques. Critiques des méthodologies de recherche du point de vue de l'interdisciplinarité et de la multidisciplinarité et application à des exemples canadiens.

**0 ETCAN 501 Méthodologies de recherche**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Préparation à la définition de la problématique de recherche choisie. Les étudiants seront invités à définir dans ce séminaire leur problème de recherche et à illustrer leur choix par des exemples tirés de la société canadienne en fonction d'une approche interdisciplinaire ou multidisciplinaire.

**0 ETCAN 504 Enjeux canadiens**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Analyse critique des enjeux portant sur le Canada. Culture et institutions en relation avec les contextes historiques et sociaux. Relations et conflits socio-politiques. Relations de sexe/genre, race, langue et classes. Nationalisme, régionalisme et mondialisation. Relations économie, société et Etat.

**ETCAN 508 Séminaire d'Etudes canadiennes I**

★3 (fi 6) (l'un ou l'autre semestre, 0-3s-0). Le contenu varie d'une année à l'autre. Les sujets sont annoncés avant la période d'inscription.

**0 ETCAN 510 Séminaire d'Etudes canadiennes II**

★3 (fi 6) (l'un ou l'autre semestre, 0-3s-0). Le contenu varie d'une année à l'autre. Les sujets sont annoncés avant la période d'inscription.

**0 ETCAN 512 Les grandes oeuvres en Etudes canadiennes**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude de textes fondateurs dans les différentes disciplines des Etudes canadiennes. Contexte historique et impact sur les études sur le Canada.

**0 ETCAN 513 Thèmes choisis en études canadiennes I**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0).

**0 ETCAN 515 Thèmes choisis en études canadiennes II**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0).

**231.131 Etudes de la religion, ET RE**

Faculté Saint-Jean

**Cours de 1er cycle****0 ET RE 102 Introduction aux religions de l'Occident**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Parcours historique des religions juïdique, chrétienne et islamique.

**0 ET RE 103 Introduction aux religions de l'Asie**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Parcours historique des religions hindouiste, bouddhiste, confucianiste et shintoïste

**0 ET RE 248 La tradition chrétienne**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Les thèmes classiques de la chrétienté depuis le Nouveau Testament jusqu'à nos jours: le message de Jésus-Christ, le kerygme, la hiérarchie de l'église, l'évolution de la doctrine, le canon des Saintes Ecritures, l'Eglise et l'Etat, les Saintes Ecritures et leur interprétation.

**231.132 Etudes interdisciplinaires, ETIN**

Faculté Saint-Jean

**Cours de 1er cycle**

The most current Course Listing is available on Bear Tracks.

**ETIN 375 Communication et innovation interculturelles**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Ce cours présente un survol des principales théories et pratiques reliées au développement des compétences individuelles à communiquer et à interagir avec différentes cultures. Cette formation prépare l'individu à mieux répondre aux défis de la diversité culturelle.

**ETIN 400 Stage I de recherche appliquée**

★3 (fi 6) (l'un ou l'autre semestre, 100 hours). Stage de recherche appliquée dans le milieu 2 de travail gouvernemental ou professionnel. Formation en recherche, administration, relations publiques et autres. Préalable(s): une moyenne de 3,0. Les stagiaires sont sélectionnés en fonction de la qualité de leur dossier et du nombre de places disponibles. Les demandes doivent être soumises auprès du Vice-doyen académique.

**ETIN 450 Stage II de recherche appliquée**

★3 (fi 6) (l'un ou l'autre semestre, 100 hours). Stage de recherche appliquée dans le milieu de travail gouvernemental ou professionnel. Formation continue en recherche, administration, relations publiques et autres. Préalable(s) : une moyenne de 3,0 et ETIN 400. Les stagiaires sont sélectionnés en fonction de la qualité de leur dossier et du nombre de places disponibles. Les demandes doivent être soumises auprès du Vice-doyen académique.

**231.133 Exchange Program, EXCH**

Education Abroad Program

**Undergraduate Courses****EXCH 800 Exchange Program**

★0 (fi 60) (two term, unassigned).

**EXCH 801 Exchange Program**

★0 (fi 30) (either term, unassigned).

**EXCH 810 Exchange Program**

★0 (fi 24) (Spring/Summer, unassigned).

**EXCH 811 Exchange Program**

★0 (fi 12) (either term or Spring/Summer, unassigned).

**EXCH 812 Exchange Program**

★0 (fi 6) (either term or Spring/Summer, unassigned).

**EXCH 813 Exchange Program**

★0 (fi 18) (either term or Spring/Summer, unassigned).

**Graduate Courses****EXCH 802 Exchange Program**

★0 (fi 6) (either term, unassigned).

**EXCH 803 Exchange Program**

★0 (fi 12) (either term, unassigned).

**EXCH 804 Exchange Program**

★0 (fi 18) (either term, unassigned).

**EXCH 805 Exchange Program**

★0 (fi 24) (either term, unassigned).

**231.134 Extension, EXT**

Faculty of Extension

**Graduate Courses****EXT 531 Philosophies, Theories and Methods of Teaching and Learning in Higher Education**

★4.5 (fi 9) (first term, 0-3s-1.5). This course will examine philosophies, theories and methods of teaching and learning in higher education with reference to current research. Course participants will also consider the practical aspects of implementing leading philosophies and theories, as well as how they connect to the University of Alberta's Academic Plan.

**EXT 532 Design and Development of Learning, Teaching and Assessment in Higher Education**

★4.5 (fi 9) (second term, 0-3s-1.5). Part I: This course focuses on the design, delivery and assessment of programs and courses, particularly at the undergraduate level. The course design cycle will be examined, with emphasis on techniques for enabling students to engage fully with course content and processes. Prerequisite: EXT 531. Part 2: Participants will develop innovative and learning-centred teaching skills through microteaching. They will assess student's learning using various formats, apply strategies for addressing common problems facing teaching and learning in higher education, analyse and discuss ways of improving specific instructional situations, and apply critical self-reflective teaching-practitioner skills.

## 231.135 Famille, FA MI

Faculté Saint-Jean

### Cours de 1er cycle

#### FA MI 333 Ecole, famille, communauté

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Analyse des problèmes que les besoins changeants de la famille et de la communauté posent à l'école (contexte francophone minoritaire/immersion française).

## 231.136 Family Medicine, F MED

Department of Family Medicine  
Faculty of Medicine and Dentistry

#### Notes

- (1) Family Medicine is included in MED 516, 526, 527, 532, 546, and 547 and DMED 511.
- (2) The Department of Family Medicine is responsible for the Human Sexuality component of MED 526 offered within the Faculty of Medicine and Dentistry.

### Undergraduate Courses

#### F MED 546 Family Medicine Student Internship

★8 (fi 16) (either term, 8 weeks). Student internship in Family Medicine for students registered in the MD program.

## 231.137 Film Studies, FS

Department of English and Film Studies  
Faculty of Arts

### Undergraduate Courses

#### FS 100 Introduction to Film Study

★3 (fi 6) (either term, 3-0-3). Introduction to basic formal concepts in film analysis including mise-en-scène, cinematographic properties, editing, and sound, as well as narrative qualities.

#### FS 201 Introduction to Film History I

★3 (fi 6) (either term, 3-0-3). A survey of world cinema from 1890 to 1950, with emphasis on major historical developments and important individual films. Prerequisite: FS 100. Not to be taken by students with credit in FS 200.

#### FS 202 Introduction to Film History II

★3 (fi 6) (either term, 3-0-3). A survey of world cinema from 1950 to present, with emphasis on major historical developments and important individual films. Prerequisites: FS 100 and FS 201. Not to be taken by students with credit in FS 200.

#### FS 215 Introduction to Film Theory

★3 (fi 6) (either term, 3-0-3). General survey of major currents and debates in film theory, including early theories on the ontology of the film image, semiotic approaches to film as language, Marxist and psychoanalytic concepts of spectatorship and the film image, the intersections of film and ideology, and the phenomenological theory of film as an embodied experience. Prerequisite: FS 100.

#### FS 309 Quebec Film

★3 (fi 6) (either term, 3-0-3). History and aesthetic developments in Quebec film, from 1930s to present. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 310 English-Canadian Film

★3 (fi 6) (either term, 3-0-3). Major trends in English Canadian film, such as documentary, feature film, animation, and experimental film. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 315 The Western Film

★3 (fi 6) (either term, 3-0-3). Survey of the cinematic Western from the silent period to the present, with emphasis on the decades between 1930 and 1970. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 316 Melodrama and Film

★3 (fi 6) (either term, 3-0-3). A study of the stylistic, thematic, and ideological features of the melodrama as a film genre with strong ties to the woman's film and the general mode of storytelling of Hollywood cinema. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 317 The Gangster Film

★3 (fi 6) (either term, 3-0-3). Survey of the Hollywood gangster film and related forms from the 1930s to the present. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 318 Science Fiction Film

★3 (fi 6) (either term, 3-0-3). A study of the Science Fiction film genre as an imaginative displacement of social and cultural concerns that define the context in which the films emerge. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 319 Film Noir

★3 (fi 6) (either term, 3-0-3). A study of the stylistic, thematic, and ideological features of the American film genre known as film noir. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 321 Animation

★3 (fi 6) (either term, 3-0-3). An overview of the development of the animated film in a global context. Production practices may include pin screen, cell, clay, collage, stop-motion, and computer animation. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 322 Gender and Film

★3 (fi 6) (either term, 3-0-3). A variable content study of the intersections between film and cultural notions and practices of gender, with a focus on either femininity, masculinity, or queer identities. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 330 Documentary Film

★3 (fi 6) (either term, 3-0-3). Theory and history of the documentary film, with emphasis on Flaherty, the Documentary Movement in Britain, the National Film Board of Canada, and recent developments in the field. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 331 Silent Film

★3 (fi 6) (either term, 3-0-3). An investigation of silent film treated as a form distinct from sound film. Historical developments, important genres and major individual films with emphasis on American and European film. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 333 Experimental Film

★3 (fi 6) (either term, 3-0-3). Avant-garde, abstract and structural film. The history and changing conceptions of experimental film, with examples from the silent era to the present. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 361 Third World Film

★3 (fi 6) (either term, 3-0-3). Examines a selection of films from Africa, Latin America, South and East Asia and the Middle East. Emphasis on socio-political context of film production and the often militant aesthetics of the filmmakers. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 365 French Film

★3 (fi 6) (either term, 3-0-3). An overview of the development of French cinema from the beginning of cinema to the present including major film movements such as Surrealism, Poetic Realism, Cinema Verité, the Nouvelle Vague, and contemporary movements. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 366 Indian Film

★3 (fi 6) (either term, 3-0-3). Survey of filmmaking in India, with attention to the Bollywood industry; important figures in "parallel cinema" such as Satyajit Ray, Ritwik Ghatak or Buddhadeb dasGupta; and other regional industries, such as Telugu, Tamil and Bengali film. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 367 German Film

★3 (fi 6) (either term, 3-0-3). Survey of German cinema, with emphasis on the films of the Weimar era (1918-1933) and the "New German Cinema" of the 1970s. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 368 Central and East-European Film

★3 (fi 6) (either term, 3-0-3). Historical and aesthetic developments in the cinemas of the Czech Republic, Poland, and Hungary from the early years of cinema to the post-1989 period. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 369 Asian Film

★3 (fi 6) (either term, 3-0-3). Survey of film practices on the Asian continent, including filmmaking in China, Taiwan, Hong Kong, the Koreans, Thailand, India, etc. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 371 Contemporary Hollywood

★3 (fi 6) (either term, 3-0-3). Concentrates on commercial American filmmaking since the 1960s. Special attention will be given to defining Postmodernism and to historically situating its rise within the development of American cinema. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 386 Race and Ethnicity in Film

★3 (fi 6) (either term, 3-0-3). Theories of cinematic representation examining race, ethnicity, and identity with an emphasis on critical race theories. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 387 Film and Technology

★3 (fi 6) (either term, 3-0-3). An examination of how technology influences the patterns of film production. Prerequisite: ★6 in FS at the 100- or 200-level.

#### FS 399 Special Topics in Film Studies

★3 (fi 6) (either term, 3-0-3). Prerequisite: ★6 in FS at the 100- or 200-level.



**FS 407 Topics in Film History**

★3 (*fi 6*) (either term, 3-0-3). Concentrated study of a specific problem in film history, either a historical period or a problem in historiography. Prerequisite: FS 201 and 202, and ★3 in FS at the 300-level; or instructor approval.

**FS 410 Topics in Filmmakers**

★3 (*fi 6*) (either term, 0-3s-3). Concentrated study of the works of individual filmmakers. The course will deal with one to three important filmmakers through representative films. Prerequisite: ★3 in FS at the 300-level or instructor approval.

**FS 412 Topics in Film Studies**

★3 (*fi 6*) (either term, variable). A seminar-based examination of specialized topics in film. Prerequisite: ★3 in FS at the 300-level or instructor approval.

**FS 480 Directed Reading in Film**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: consent of Department.

**Graduate Courses****FS 510 Selected Topics in Film**

★3 (*fi 6*) (either term, 3-0-0).

**FS 521 Directed Reading Course I**

★3 (*fi 6*) (either term, 3-0-0).

**FS 522 Directed Reading Course II**

★3 (*fi 6*) (either term, 3-0-0).

**231.138 Finance, FIN**

Department of Finance and Statistical Analysis  
Faculty of Business

**Note:** Enrolment in all FIN courses is restricted to students registered in the Faculty of Business, or to students registered in specified programs that require Business courses to meet degree requirements and who have obtained prior approval of their Faculty.

**Undergraduate Courses****FIN 301 Introduction to Finance**

★3 (*fi 6*) (either term, 3-1s-0). Types of securities and basic methods of valuation. Valuation and selection of physical and intellectual assets. Operation of asset markets and market efficiency. Risk measures and risk reduction methods. Financing policy, including choices between debt and equity financing. Note: Students are expected to have basic familiarity with microcomputer applications. Prerequisite: STAT 151 or equivalent. Pre- or corequisite: MGTSC 312, ACCTG 300 or 311.

**FIN 412 Investment Principles**

★3 (*fi 6*) (either term, 3-0-0). This course examines securities and securities markets with emphasis on stocks and bonds. Topics include information, interest rates, risk-return relationships, efficient markets, diversification, portfolio performance measurement, and the application of financial theory to investment decisions. Prerequisite: FIN 301 and MGTSC 312. Students may not receive credit for both FIN 412 and ECON 442.

**FIN 413 Risk Management**

★3 (*fi 6*) (either term, 3-0-0). This course examines the markets and valuation models for options and future contracts, and their application to hedging and the valuation of the other financial contracts. Prerequisite: FIN 301.

**FIN 414 Operation of Financial Institutions**

★3 (*fi 6*) (either term, 3-0-0). This course covers the organization and operation of primary and secondary securities markets, and financial intermediaries. Topics include stock and bond market operation, management issues in other financial institutions. Prerequisite: FIN 301. Students may not receive credit for both FIN 414 and ECON 341.

**FIN 416 Advanced Portfolio Management**

★3 (*fi 6*) (either term, 3-0-0). Recent theoretical and empirical developments in portfolio management are covered with an emphasis on investment strategy and the evaluation of investment performance. A student project makes extensive use of microcomputing, spreadsheets and financial market data. Prerequisite: FIN 301, 412.

**FIN 418 Fixed Income**

★3 (*fi 6*) (either term, 3-0-0). The valuation and management of interest-rate contracts. The main focus is on the behaviour of bond portfolios and related risk-management techniques. The institutional features of North American fixed-income markets complete the course. Prerequisites: FIN 301, 412.

**FIN 422 Capital Investment**

★3 (*fi 6*) (either term, 3-0-0). Capital budgeting and the determination of the cost of capital to the firm. Prerequisite: FIN 301 and MGTSC 312.

**FIN 434 Advanced Corporate Finance**

★3 (*fi 6*) (either term, 3-0-0). This course covers advanced topics in corporate finance such as capital structure, dividend policy, asset selection, agency problems, mergers and acquisitions. Prerequisite: FIN 301 and MGTSC 312.

**FIN 436 Investment Management**

★3 (*fi 6*) (either term, 3-0-0). This course provides students with experience managing an institutional asset portfolio, the PRIME FUND. Students interact with investment professionals in making asset acquisition and divestiture decisions within the institutional framework of the fund. This course draws on and unifies skills related to investment analysis and portfolio theory. It combines traditional academic objectives with the practical demands of hands-on investment analysis and portfolio management. The students learn by actually using the tools of the trade. These include printed materials, real-time computerized sources of information and, most importantly, access to practising analysts and managers. Students also learn about the differences between institutional and personal investment decisions, the mechanics of trading, the different providers of trading services, and cash management. Prerequisites: FIN 412, 416. Open only to students with the consent of the Department.

**FIN 442 International Financial Markets**

★3 (*fi 6*) (either term, 3-0-0). An overview of the international financial environment and the financial function in the multinational corporation. Its purpose is to provide decision-making skills in international money and capital markets. Prerequisite: FIN 301.

**FIN 480 Honours Essay in Finance**

★3 (*fi 6*) (second term, 3-0-0). Preparation of the honours essay required for students in the Finance Honours program. Prerequisite: consent of the Department.

**FIN 488 Selected Topics in Finance**

★3 (*fi 6*) (either term, 3-0-0). Normally restricted to third- and fourth-year Business students. Prerequisites: FIN 301 or consent of Department. Additional prerequisites may be required.

**FIN 490 Finance Competition Part I**

★1.5 (*fi 3*) (either term, 0-1.5s-0). Preparation for Student Competition in Finance. Prerequisite: consent of Instructor.

**FIN 491 Finance Competition Part II**

★1.5 (*fi 3*) (either term, 0-1.5s-0). Completion of Student Competition in Finance. Prerequisite: FIN 490 and consent of Instructor.

**FIN 495 Individual Research Project I**

★3 (*fi 6*) (either term, 3-0-0). Special study for advanced undergraduates. Prerequisites: consent of Instructor and Assistant Dean, Undergraduate Program.

**FIN 496 Individual Research Project II**

★3 (*fi 6*) (either term, 3-0-0). Special Study for advanced undergraduates. Prerequisites: FIN 495, consent of Instructor and Assistant Dean, Undergraduate Program.

**FIN 497 Individual Research Project III**

★3 (*fi 6*) (either term, 3-0-0). Special Study for advanced undergraduates. Prerequisites: FIN 496, consent of the Instructor and Assistant Dean, Undergraduate Program.

**Graduate Courses****FIN 501 Managerial Finance**

★3 (*fi 6*) (either term, 3-0-0). Fundamental concepts in asset valuation are discussed within the context of simple asset pricing models and efficient financial markets. This course introduces the valuation of financial assets such as bonds and stocks. Further topics include the issuing of financial securities, leverage, dividend policy, cash management, and derivative securities. Credit will not be given for FIN 501 when either FIN 502 or 503 have been completed. Prerequisites: ACCTG 501, BUEC 503, and MGTSC 501.

**FIN 502 Introduction to Financial Valuation**

★3 (*fi 6*) (either term, 3-0-0). Fundamental concepts in asset valuation are discussed in the context of simple asset pricing models. This course introduces the valuation of financial assets such as bonds and stocks. The concept of Net Present Value in capital investments is also introduced, along with basic financial planning. Other topics include an introduction to Markowitz diversification, the Capital Asset Pricing Model, and basic cost of capital estimation. Not open to students who have completed FIN 501. Corequisites: ACCTG 501, BUEC 503, MGTSC 501. FIN 502 must be taken as part of a FIN 502, FIN 503 sequence.

**FIN 503 Introduction to Corporate Finance**

★3 (*fi 6*) (either term, 3-0-0). Fundamental concepts in the modern theory of corporate finance are discussed. This course introduces dividend policy, capital structure, cost of capital and its relation to leverage, and an advanced treatment of capital investments. An introduction to derivatives payoffs and valuation concludes the course. Not open to students who have completed FIN 501. Prerequisite: FIN 502.

**FIN 604 The Practice of Investment Banking**

★3 (fi 6) (either term, 3-0-0). This course is concerned with the organization, evolution and structure of, and functions performed by, investment banks. Specifically, the course will cover topics such as the offering of securities to the public, the underwriting process, normal course and short form prospectus offerings, and private placements. In addition, exchange listings, maintaining exchange trading status, the role of research analysts and insider trading regulation will be studied. Co-requisite: FIN 501 or FIN 503.

**FIN 614 Investments**

★3 (fi 6) (either term, 3-0-0). This course is concerned with investment in stocks, bonds and other financial assets. Topics include, but are not limited to, interest rates, risk-return relationships, investment valuation, and market information and efficiency. Prerequisite: FIN 501 or Co-requisite: FIN 503.

**FIN 615 Trading and Financial Markets**

★3 (fi 6) (either term, 3-0-0). This course will discuss the functioning of global financial markets and trading and price determination in these markets. Topics covered will include order submission and trading strategies, market structure, transaction cost and liquidity measurement, price formation, and technical analysis. The lectures will draw on academic and practitioner research as well as information from financial markets. Prerequisite: FIN 503. It is recommended the student have credit in FIN 614.

**FIN 616 Securities Markets and Financial Intermediation**

★3 (fi 6) (either term, 3-0-0). This course is concerned with the structure and operations of securities markets. Specifically, the course will cover the history and evolution of securities regulation in North America and Canada, and the history and current state of the Canadian securities industry regulatory environment. In addition, the organization of secondary markets, pricing of brokerage and dealer services, and the economics of money management will be studied. Prerequisite: FIN 501 or 503.

**FIN 634 Corporate Financial Planning**

★3 (fi 6) (either term, 3-0-0). Advanced discussion of asset choice and financial structure. Supplemental case study. Prerequisite: FIN 503.

**FIN 635 Venture Capital**

★3 (fi 6) (either term, 3-0-0). Covers the theory and practice of venture capital financing of entrepreneurial firms. Topics to be discussed include, but are not limited to, the following areas: venture capital fundraising (labour-sponsored venture capital corporations, limited partnerships and corporate venture capital) characteristics of entrepreneurial ventures (including agency problems, firm valuation) at different stages of development (seed, start-up, expansion, mezzanine, buyout, turnaround), the structure of venture capital financial contracts (staging, syndication, forms of finance), restrictive covenants, investment duration, and venture capital exits (IPOs, acquisitions, secondary sales, buybacks, write-offs). Prerequisite: FIN 501 or 503.

**FIN 644 International Finance**

★3 (fi 6) (either term, 3-0-0). The objective of this course is to acquaint students with macro and micro aspects of international finance. At the macro level coverage will include theories of direct investment, the international monetary mechanism, foreign exchange markets, and repercussions from balance of payments difficulties. Micro level materials will include problems of doing business internationally and a survey of public and private foreign and international finance institutions. The final part of the course will review Canada's role in international business. Prerequisite: FIN 501 or 503.

**FIN 654 Risk Management**

★3 (fi 6) (either term, 3-0-0). Futures, options, and other derivative securities. Markets, valuation models, application to risk management through hedging, and the application of pricing models to the valuation of financial contracts. Prerequisite: FIN 501 with permission of the program office or FIN 503. It is recommended the student have credit in FIN 614.

**FIN 673 Mergers, Restructuring, and Corporate Control**

★3 (fi 6) (either term, 3-0-0). Financial and economic aspects of corporate mergers, restructuring, downsizing, and bankruptcy are examined. Relations between corporate structure and performance are investigated. Specific attention is paid to the roles of top management and boards of directors. Special issues relating to privatization and restructuring in former socialist economies are studied. Prerequisite: FIN 501 with permission of the program office or FIN 503.

**FIN 686 Selected Topics in Finance**

★3 (fi 6) (either term, 3-0-0). Topics dealt with in this seminar may vary from year to year, and will be chosen at the discretion of the instructor. Prerequisite: FIN 501.

**FIN 701 Advanced Seminar in Finance I**

★3 (fi 6) (either term, 3-0-0). Provides an introduction to theoretical and empirical work in asset pricing and market microstructure. Topics covered include market efficiency, time varying expected returns and volatility, tests of asset pricing models, and models and analysis of price formation. Prerequisite: Open to doctoral students in the School of Business, the Department of Economics and the Program of Mathematical Finance. For all other students, written permission

of instructor required. Approval of the Business PhD Program Director is also required for non-PhD students.

**FIN 702 Advanced Seminar in Finance II**

★3 (fi 6) (either term, 3-0-0). Introduces students to theoretical and empirical research in corporate finance. Potential topics include contracting theory, the theory of the firm, corporate governance, capital structure, and dividend policy. Prerequisite: Open to doctoral students in the School of Business, the Department of Economics and the Program of Mathematical Finance. For all other students, written permission of instructor required. Approval of the Business PhD Program Director is also required for non-PhD students.

**FIN 703 Advanced Seminar in Finance III**

★3 (fi 6) (either term, 3-0-0). Provides advanced mathematical coverage of important topics in finance. Potential topics include continuous-time models of asset pricing and portfolio choice, pricing and hedging of derivative securities, and the applications of contingent claim pricing models to the valuation of real assets and corporate liabilities. Prerequisite: Open to doctoral students in the School of Business, the Department of Economics and the Program of Mathematical Finance. For all other students, written permission of instructor required. Approval of the Business PhD Program Director is also required for non-PhD students.

**FIN 704 Individual Research**

★3 (fi 6) (either term, 3-0-0).

**FIN 705 Research Seminar in Finance**

★3 (fi 6) (two term, 3-0-0). This seminar is a single-term course offered over two terms. Members of the faculty and visiting speakers will often present their research. Advanced students are expected to present original work related to their doctoral theses. Other students will discuss and critique papers on the frontiers of current research. Pre- or corequisites: FIN 701, 702, and 703. Open to doctoral students in the School of Business, the Department of Economics and the Program of Mathematical Finance. For all other students, written permission of instructor required. Approval of the Business PhD Program Director is also required for non-PhD students.

**FIN 815 Financial Analysis and Decision Making**

★1.5 (fi 16) (second term, 18 hours). A week-long intensive course. Understanding cash flow analysis, short-term financing, pro formas, the assessment of financial performance, ratio analysis and the role of financial intermediaries. Restricted to Executive MBA students only.

**FIN 830 Finance**

★3 (fi 32) (second term, 3-0-0). Understanding valuation, capital markets, venture capital, international markets, and corporate risk management. Restricted to Executive MBA students only.

## 231.139 Forest Economics, FOREC

Department of Rural Economy  
Faculty of Agricultural, Life and Environmental Sciences

**Note:** See also Agricultural and Resource Economics (AREC), Environmental and Conservation Sciences (ENCS), Interdisciplinary Undergraduate Courses (INT D), and Rural Sociology (R SOC) listings for related courses.

### Undergraduate Courses

**Note:** See also INT D 565 for courses which are offered by more than one Department or Faculty and which may be taken as options or as a course in this discipline.

**O FOREC 345 Economics of Forestry**

★3 (fi 6) (first term, 3-0-0). Economic aspects of forest production, marketing, finance, and policy. Prerequisite: ECON 101.

**FOREC 400 Special Topics**

★3 (fi 6) (either term, 0-3s-0). Individual study. Study of a selected topic or problem requiring both written and oral reports. Prerequisite: consent of Department Chair.

**O FOREC 473 Forest Policy**

★3 (fi 6) (first term, 3-0-0). Analysis of forest resource policy formation and evaluation. Review of selected policies and programs provincially, nationally, and internationally. Analysis of current policy issues. Prerequisite: One of the following: AREC 200, FOREC 345, INT D 365, AREC 365, ECON 365, INT D 369, ECON 369. (Offered jointly by the Departments of Renewable Resources and Rural Economy.) [Rural Economy]

### Graduate Courses

**Note:** Undergraduate course may be taken for credit by Graduate Students in Rural Economy: FOREC 473.

**FOREC 500 Research Projects in Forest Economics**

★3 (fi 6) (either term, 0-3s-0). Individual study. Investigations of a special problem

involving field or library study and preparation of written reports. Prerequisite: consent of Department Chair.

### **O FOREC 545 Forest Resource Economics**

★3 (*fi 6*) (either term, 3-0-0). Economic analysis of public policy issues and regulatory activities in the forestry sector. Analysis of the roles of institutions and property rights in regulating: timber supply (the harvesting and management of forest stocks and flows); the production and trade of forest products; the provision of multiple forest resources; and other forest policy issues. Prerequisite: consent of Instructor, ECON 481 recommended.

### **FOREC 600 Directed Studies**

★3 (*fi 6*) (either term, 0-3s-0). Analysis of selected research problems and design or research projects in forest economics. Prerequisite: consent of Department Chair.

### **FOREC 673 Forest Policy**

★3 (*fi 6*) (either term, 3-0-0). Analysis of forest resource policy formation and evaluation. Review of selected policies and programs provincially, nationally, and internationally. Analysis of current policy issues. Prerequisite: One of the following: AREC 200, FOREC 345, INT D 365 or AREC 365, INT D 369, ECON 369. Not available for students with credit in FOREC 473. Available only to students in MBA/MAG, MBA/MF, MBA in Natural Resource and Energy Programs, or by consent of Department. (Offered jointly by the Departments of Renewable Resources and Rural Economy.) [Rural Economy]

## 231.140 Forest Engineering, FOREN

Department of Renewable Resources  
Faculty of Agricultural, Life and Environmental Sciences

### Undergraduate Courses

#### **L FOREN 335 General Forest Harvesting and Transportation**

★3 (*fi 6*) (first term, 3-0-0). Harvesting and transportation methods and technologies as applied to wood-harvesting operations. This is a general course for Forestry students who desire a basic knowledge of current technologies used to conduct forest operations.

#### **L FOREN 355 Wood Science and Utilization**

★3 (*fi 6*) (second term, 3-0-3). The anatomy and identification of woods; biological, chemical, and physical properties of wood and its components. Lumber, pulp and paper, and reconstituted wood products technologies. Concept of integrated utilization.

## 231.141 Forest Science, FOR

Department of Renewable Resources  
Faculty of Agricultural, Life and Environmental Sciences

### Notes

- (1) See also Agricultural and Resource Economics (AREC), Animal Science (AN SC), Environmental and Conservation Sciences (ENCS), Forest Economics (FOREC), Forest Engineering (FOREN), Interdisciplinary Undergraduate Courses (INT D), Plant Science (PL SC), Renewable Resources (REN R), and Soil Science (SOILS) listings for related courses.
- (2) See also INT D 365 and 466 for courses which are offered by more than one Department or Faculty and which may be taken as options or as a course in this discipline.

The following courses were renumbered:

Old	New
FOR 302, 303 304	REN R 299

### Undergraduate Courses

#### **L FOR 100 Introduction to Forestry**

★3 (*fi 6*) (first term, 3-0-0). A general introduction to trees and other forest plants, forest ecology, and forest land-use planning. Includes discussions of the relationships between recreation, water, wildlife, agriculture, range and timber to forest management policies and practices in Alberta and elsewhere. Not available for credit to BSc Forestry students.

#### **L FOR 101 Introductory Forestry Field School**

★0 (*fi 3*) (first term, 6 days). A general overview of the practice of Forestry. This orientation includes an introduction to basic forest measurements, forest management practices, and will include tours of a number of major forest operations in Alberta. Course runs for six days just prior to Fall registration. "Requires payment of additional student instructional support fees." Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **L FOR 210 Forest Measurements**

★3 (*fi 6*) (second term, 3-0-3). Principles and practices of measuring and

estimating present and future fibre production of forest communities, including applications of statistics, sampling techniques, regression analysis, and computer programming. Prerequisites: MATH 113 or 114, and ★3 of statistics. Corequisite: REN R 110. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **L FOR 314 Forest Soils**

★3 (*fi 6*) (second term, 3-0-3). Chemical, physical, and biological properties and processes of soil in relation to site and the growth of forest vegetation; nutrient cycling; influences of surface soil erosion, fertilization, and fire upon forest soil productivity; forest land classification. Prerequisite: SOILS 210. [Renewable Resources]

#### **L FOR 322 Forest Ecosystems**

★3 (*fi 6*) (first term, 3-0-3). Analysis of the structure and function of forest ecosystems from a stand to a landscape perspective. Topics include physical structure and heterogeneity, community composition, energy flow productivity, nutrient cycling, succession, ecosystem classification, impacts of natural and anthropogenic disturbance. Lab exercises during the first three weeks are held outside. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisite: BIOL 208 or both (BIOL 108 and REN R 120) or consent of Instructor.

#### **L FOR 323 Silviculture**

★3 (*fi 6*) (first term, 3-0-3). Forest regeneration principles and techniques; stand tending including fertilization, thinning, pruning and drainage; harvesting systems for reforestation; nursery practices; reforestation, the law and current practices. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisite: BIOL 208 or consent of Instructor.

#### **L FOR 405 Intermediate Forest Problems**

★3 (*fi 6*) (either term, 0-3s-0). Individual study. Problems in specialized areas of forest science. Prerequisite: consent of Instructor.

#### **L FOR 423 Advanced Silviculture**

★3 (*fi 6*) (second term, 3-0-0). Readings, discussions and exercises on current topics in Silviculture. Possible topics include: forest microsites, forest competition, plantation forestry, partial-cut systems, or intensive management. Prerequisite: FOR 323.

#### **L FOR 431 Integrated Forest Management**

★3 (*fi 6*) (second term, 3-0-3). Problem solving, decision making and planning in relation to the management of forest resources. Application of models and related tools. Public involvement and issues management will be addressed. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisite: REN R 299 (or FOR 302, 303, 304) and FOR 323 and REN R 430. Credit cannot be obtained for both CAPS 431 and FOR 431. (Offered jointly by the Departments of Renewable Resources and Rural Economy.) [Renewable Resources]

### Graduate Courses

**Note:** 400-level courses listed under ENCS, FOR, INT D, REN R or SOILS and offered by the Department of Renewable Resources may be taken for graduate credit under certain circumstances. (See §205.67.1)

#### **L FOR 501 Special Topics in Forestry**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: consent of Instructor.

#### **L FOR 502 Problems in Forest Ecology**

★3 (*fi 6*) (either term, 0-3s-0). Individual study. Directed study in forest ecology. Prerequisite: consent of Instructor.

#### **L FOR 503 Problems in Silviculture**

★3 (*fi 6*) (either term, 0-3s-0). Individual study. Directed study in silviculture. Prerequisite: consent of Instructor.

#### **L FOR 522 Advanced Forest Ecology**

★3 (*fi 6*) (second term, 0-3s-0). Current topics in forest ecology are dealt with through lectures, student seminars, readings, and discussion. Possible topics include: ecosystem management, forest fragmentation, biodiversity, succession, community dynamics, environmental impacts of harvesting, 'New Forestry.' Prerequisite: consent of Instructor. Offered in alternate years.

#### **FOR 523 Silvicultural Systems**

★3 (*fi 6*) (Spring/Summer, 2 weeks). Silvicultural systems encompass a planned program of silvicultural treatment extending throughout the life of a stand. In this course we visit and examine a variety of silvicultural systems including: clearcutting with natural regeneration and/or planting, seed trees, shelterwood, selection, and variable retention systems. We discuss impacts and implications of these systems in terms of resulting stand structures, cost, risk, growth and yield, habitat, and other issues. The course will involve a 10 to 14 day field trip (in May, June or August) to visit a range of silvicultural systems used in forests in western



Canada or other regions, as well as written assignments. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Standard University tuition and fees apply. Prerequisite: FOR 323 or permission of the instructor. Offered in alternate years during summer term. This course has limited enrolment and is closed to web registration.

**L FOR 535 Problems in Forest Resources Management**

★3 (fi 6) (either term, 0-3s-0). Individual study. Directed study in forest resources management. Prerequisite: consent of Instructor.

**L FOR 545 Problems in Forest Fire**

★3 (fi 6) (either term, 0-3s-0). Individual study. Directed study in forest fire. Prerequisite: consent of Instructor.

**L FOR 555 Problems in Forest Hydrology**

★3 (fi 6) (either term, 0-3s-0). Individual study. Directed study in forest hydrology. Prerequisite: consent of Instructor.

## 231.142 Français, FRANC

Faculté Saint-Jean

### Cours de 1er cycle

**O FRANC 101 Communication orale et écrite**

★6 (fi 12) (aux deux semestres, 3-0-3). Étude des éléments et des structures de base du français parlé et écrit; identification et mise en pratique de notions élémentaires et de certains schémas de communication. Note: Ce cours se destine aux étudiants qui ne disposent pas de la base nécessaire pour satisfaire aux exigences de FRANC 110 et 111 (French 30 ou l'équivalent) et n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 100.

**O FRANC 110 Expression orale I**

★3 (fi 6) (l'un ou l'autre semestre, 0-4L-0). Vise à faire acquérir les compétences communicatives orales nécessaires à l'expression courante de niveau intermédiaire dans le cadre de la francophonie interculturelle.

**FRANC 111 Expression écrite I**

★3 (fi 6) (l'un ou l'autre semestre, 0-5L-0). Vise à faire acquérir les compétences communicatives écrites nécessaires à l'expression courante de niveau intermédiaire dans le cadre de la francophonie interculturelle.

**O FRANC 140 Communication orale et écrite**

★6 (fi 12) (aux deux semestres, 3-0-3). Étude du français parlé et écrit, par la mise en relation de la langue et de son usage dans un contexte socio-culturel francophone précis. Travaux pratiques d'écoute, de lecture, d'écriture et, surtout, d'expression orale. Préalable(s): French 30 ou l'équivalent, ou FRANC 101 ou FREN 100 ou 111/112. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 150 ou 211/212.

**O FRANC 210 Expression orale II**

★3 (fi 6) (l'un ou l'autre semestre, 0-4L-0). Vise à faire acquérir les compétences communicatives orales nécessaires à l'expression de niveau avancé dans le cadre de la francophonie interculturelle.

**FRANC 211 Expression écrite II**

★3 (fi 6) (l'un ou l'autre semestre, 0-5L-0). Vise à faire acquérir les compétences communicatives écrites nécessaires à l'expression de niveau avancé dans le cadre de la francophonie interculturelle.

**FRANC 213 Morphologie et syntaxe**

★3 (fi 6) (l'un ou l'autre semestre, 0-3L-0). Étude des usages du français écrit (sans négliger l'oral). Développement de stratégies d'autocorrection. Ce cours n'est pas accessible aux étudiants ayant des crédits pour FRANC 231.

**O FRANC 220 Expression orale III**

★3 (fi 6) (l'un ou l'autre semestre, 0-4L-0). Vise à faire acquérir les compétences communicatives orales nécessaires à l'expression courante de niveau supérieur dans le cadre de la francophonie interculturelle.

**FRANC 221 Expression écrite III**

★3 (fi 6) (l'un ou l'autre semestre, 0-5L-0). Vise à faire acquérir les compétences communicatives écrites nécessaires à l'expression courante de niveau supérieur dans le cadre de la francophonie interculturelle.

**O FRANC 225 Lire le texte littéraire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Ce cours vise à faire connaître différents concepts et stratégies de lecture et d'analyse du texte littéraire. Les ouvrages à l'étude seront choisis en fonction des approches et des méthodologies présentées. Préalable(s): FRANC 221 ou l'approbation du Vice-doyen aux affaires académiques.

**O FRANC 230 Correction phonétique et diction française**

★3 (fi 6) (l'un ou l'autre semestre, 1-2L-0). Étude du système phonétique du français dans le but d'améliorer la prononciation. Cours axé sur la pratique s'adressant exclusivement aux étudiants dont le français n'est pas la langue

première d'usage. Soumis à l'approbation du professeur. Pratique en groupe et au laboratoire de langues.

**L FRANC 232 Techniques de rédaction**

★3 (fi 6) (l'un ou l'autre semestre, 0-3L-0). Pratique de la rédaction technique, journalistique et de la vulgarisation scientifique. Préalable(s): FRANC 221 ou l'approbation du Vice-doyen aux affaires académiques.

**O FRANC 235 Survol de la littérature francophone**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Ce cours d'introduction à la littérature en français vise à faire connaître, dans une perspective sociocritique, les noms des grands écrivains et penseurs du monde francophone, leurs idées et la mise en texte de ces idées. Le corpus à l'étude consistera en des oeuvres représentatives à travers les siècles. Ce cours présuppose une bonne connaissance et une maîtrise de la langue française aux plans grammatical, syntaxique et lexical.

**O FRANC 241 Communication orale et écrite**

★6 (fi 12) (aux deux semestres, 3-0-3). Perfectionnement du français écrit et, surtout, oral. Ce cours se destine à l'étudiant ayant réussi FRANC 110 et 111 ou FREN 150 ou 211/212.

**FRANC 249 Créativité et jeu dramatique**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). La mise en évidence des possibilités créatrices du dialogue et de la nécessité de faire découvrir, par le jeu dramatique, le fond commun et permanent de la langue parlée et de la langue écrite. Pratique de la préparation et de la mise en marche des dramatisations, afin d'explorer la création des diverses formes dramatiques. Note : Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en ADRAM 249.

**FRANC 302 Théâtres francophones du Canada**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Perspectives contemporaines sur l'évolution du théâtre francophone au Canada. Étude des oeuvres qui ont marqué son histoire et des fonctions de la langue dans les répertoires dramatiques québécois et franco-canadiens. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour ADRAM 302. Préalables: ★3 de niveau 200 parmi FRANC, CAFR, ADRAM, ou l'équivalent.

**FRANC 310 Lecture à voix haute**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Techniques de lecture à voix haute, exploration des ressources corporelles, vocales, musicales, visuelles et spatiales pour la lecture devant public. Survol historique de la lecture, interprétation de textes divers et procédés de mise en lecture publique. Ce cours n'est pas accessible aux étudiants ayant suivi ADRAM 310. Préalables : ★6 de niveau 200 parmi FRANC, CA FR, ADRAM ou l'équivalent.

**O FRANC 314 Pratique avancée du français oral et écrit**

★6 (fi 12) (aux deux semestres, 3-0-3). Sensibilisation aux différents moyens d'exprimer une idée. Ce cours a pour but d'aider l'étudiant à mieux structurer sa pensée en français et, ce, à l'oral et à l'écrit. Il se destine à l'étudiant qui voudrait approfondir les connaissances et compétences acquises en FRANC 210 et 211 ou en FREN 252 ou 298.

**FRANC 322 Pratique de la dissertation**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). La compréhension, l'analyse et la synthèse d'informations. L'étude et la manipulation du raisonnement logique. La recherche et l'exploitation des arguments. L'élaboration et la mise en forme de la dissertation comme texte clair, cohérent et convaincant. Travaux pratiques. Cours obligatoire pour l'obtention du diplôme de la Faculté. Ce cours présuppose une bonne connaissance et une maîtrise de la langue française aux plans grammatical, syntaxique et lexical. Préalable(s): FRANC 221 ou l'approbation du Vice-doyen aux affaires académiques.

**O FRANC 325 Littérature française du XVIIe siècle**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude d'oeuvres représentatives du XVIIe siècle. Préalable(s): FRANC 235.

**O FRANC 326 Littérature française du XVIIIe siècle**

★3 (fi 6) (deuxième semestre, 3-0-0). Evolution des genres littéraires illustrée par des textes du XVIIIe siècle. Préalable(s): FRANC 235. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 360.

**O FRANC 327 Littérature française du XIXe siècle**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). L'analyse des mouvements littéraires. L'évolution de la conception littéraire à travers les textes du XIXe siècle. Préalable(s): FRANC 235. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 380.

**O FRANC 328 Littérature française du XXe siècle**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude d'oeuvres représentatives de la littérature moderne. Introduction à la littérature contemporaine. Préalable(s): FRANC 235 et un demi-cours de littérature française. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 380.

**O FRANC 331 Étude avancée du français et de l'anglais I**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude comparative des systèmes français et anglais sur les plans syntaxique, morphologique, lexical et sémantique. Introduction à la traduction. Préalable(s): FRANC 221 ou l'équivalent. Note: Ce

cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 351 ou 352.

### **FRANC 332 Etude avancée du français et de l'anglais II**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Etude comparative des systèmes français et anglais sur les plans syntaxique, morphologique, lexical et sémantique. Introduction à la traduction, suite. Préalable(s): FRANC 331 ou l'équivalent. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 351 ou 352.

### **FRANC 400 Initiation à la traduction anglais-français**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Étude des fondements de la traduction appliquée à des textes généraux. Travaux pratiques, méthode et théorie. Préalable(s) : ★6 parmi FRANC 322, 331, 332, 475, LINGQ 300. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 454. Note : Ce cours exige une bonne connaissance du français et de l'anglais.

### **FRANC 403 Théâtres francophones contemporains**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Études d'oeuvres dramatiques et de mouvements esthétiques appartenant à divers répertoires francophones contemporains. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en ADRAM 403 et ADRAM/Franc 303. Préalables : ★6 de niveau 300 parmi FRANC, CAFR, ADRAM, ETCAN 330 et 332 ou l'équivalent.

### **FRANC 410 Traduction du théâtre et de la littérature au Canada**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Initiation à la traduction littéraire et théâtrale. Étude des répertoires traduits d'une langue officielle à l'autre au Canada. Préalable(s) : ★6 de niveau 300 ou 400 parmi CA FR, FRANC, LINGQ. Note : Ce cours exige une bonne connaissance du français et de l'anglais.

### **FRANC 450 Choix de sujet**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Etude d'un sujet au choix en langue française. Préalable(s): FRANC 322 et ★3 de niveau 300 en langue française ou l'approbation du Vice-doyen aux affaires académiques.

### **FRANC 470 Analyse syntaxique**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Etude approfondie de la structure de la phrase française. Théorie et pratique. Préalable(s): FRANC 221 ou l'équivalent.

### **FRANC 475 Stylistique du français**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Initiation aux procédés stylistiques. Préalable(s): FRANC 322 ou l'équivalent.

### **FRANC 480 Choix de sujet**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Préalable(s): FRANC 322 et ★3 en littérature ou en langue de niveau 300.

### **FRANC 484 Création**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Théorie et pratique du processus créatif dans l'écriture; introduction aux procédés discursifs de la poésie, du roman et de la pièce de théâtre. Préalable(s): FRANC 225, 235 et ★3 en littérature de niveau 300. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour ADRAM 484.

### **FRANC 499 Etudes dirigées**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Cours destiné à permettre aux étudiants d'approfondir un sujet de leur choix en littérature d'expression française non-canadienne. Préalable(s): FRANC 235 et ★6 en littérature française.

### **FRANC 520 Mémoire de Français - langue et littérature**

★6 (*fi 12*) (aux deux semestres, 0-3s-0). Préparation du mémoire requis en quatrième année du programme de spécialisation en Français-langue et littérature.

## 231.143 French for Educators / Français pour éducateurs, FR ED

Faculté Saint-Jean

### Notes

(1) FR ED courses are restricted to teachers holding a teaching certificate and are not to be taken by students pursuing an undergraduate degree.

Les cours FR ED sont réservés aux personnes possédant déjà un certificat d'enseignement et ne sont pas accessibles aux personnes voulant obtenir un diplôme de premier cycle

(2) FR ED courses are not prerequisites for FRANC or FREN courses.

Les cours FR ED ne sont pas des préalables pour les cours FRANC ou FREN.

(3) FR ED courses are not substitutes for FRANC or FREN courses which are structured to assure language proficiency development in a sequential manner. Les cours FR ED ne remplacent pas les cours FRANC ou FREN qui sont structurés de manière à assurer un développement linguistique séquentiel.

(4) Laboratory components require access to a computer and the Internet.

Les laboratoires nécessitent l'accès à un ordinateur et à l'Internet.

(5) These courses may include a section offered at distance; see 22.2.4 Alternative Delivery Courses.

Ces cours peuvent comprendre une section distance; voir 22.2.4 Alternative Delivery Courses.

## Cours de 1er cycle

### **FR ED 101 French for French as a Second Language (FSL) Teachers I**

★3 (*fi 6*) (either term, 0-4L-0). Specifically designed for elementary, junior and senior high French as a second language teachers who have a basic knowledge of French. Teachers will have numerous opportunities to use the vocabulary and idiomatic expressions related to the themes outlined in the general and specific learner expectations of Alberta Learning's Program of Study for the beginner levels of French as a second language. Vocabulary development and conversational practice will be centered on these themes and those found in the learning resources approved by Alberta Learning. Language laboratory sessions will concentrate on improving one's diction and pronunciation. Little English will be spoken in this course and will be limited to brief explanations. May contain alternate delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the calendar.

### **FR ED 102 French for French as a Second Language (FSL) Teachers II**

★3 (*fi 6*) (either term, 0-4L-0). Specifically designed for junior and senior high French as a second language teachers who have reached the intermediate proficiency level. Teachers will have numerous opportunities to use the vocabulary and idiomatic expressions related to the themes outlined in the general and specific learner expectations of Alberta Learning's Program of Study for French as a second language intermediate levels. Vocabulary development and conversational practice will be centered on these themes and those found in the learning resources approved by Alberta Learning. Language laboratory sessions will concentrate on improving one's diction and pronunciation. Little English will be spoken in this course and will be limited to brief explanations. May contain alternate delivery sections; Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the calendar.

### **FR ED 103 French for French as a Second Language (FSL) Teachers III**

★3 (*fi 6*) (either term, 0-4L-0). Specifically designed for senior high French as a second language teachers who have reached a high intermediate or advanced proficiency level. Teachers will have numerous opportunities to use the vocabulary and idiomatic expressions related to the themes outlined in the general and specific learner expectations of Alberta Learning's French as a Second language Program of Study at the senior high level. Vocabulary development and conversational practice will be centered on these themes and those found in the learning resources approved by Alberta Learning. Language laboratory sessions will concentrate on improving one's diction and pronunciation. Little English will be spoken in this course and will be limited to brief explanations. May contain alternate delivery sections; Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the calendar.

### **FR ED 201 Le français de la salle de classe**

★3 (*fi 6*) (l'un ou l'autre semestre, 0-4L-0). Ce cours est destiné aux enseignants et enseignantes de français langue seconde qui maîtrisent suffisamment bien le français mais qui veulent acquérir une plus grande spontanéité. L'accent sera mis sur l'acquisition des termes et tournures propres à l'enseignement au quotidien. Par des mises en situation et des jeux de rôles, on pratiquera le vocabulaire spécialisé de la gestion de classe et de l'animation pédagogique. Les sessions de laboratoire de langue permettront aux étudiants et aux étudiantes d'améliorer leur diction et leur prononciation. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire l'annuaire.

### **FR ED 210 Apprentissage du français par l'exploration du monde virtuel**

★3 (*fi 6*) (l'un ou l'autre semestre, 0-4L-0). Fondé sur la prémisse que les besoins de formation en français varient grandement d'un apprenant à l'autre, ce cours vise à permettre à l'apprenant de se familiariser avec les ressources pédagogiques disponibles à l'Internet par le biais de visites guidées. Le cours couvrira la grammaire, le vocabulaire, la rédaction et la révision de textes, la compréhension auditive et la culture. De plus, le format du cours permettra aux apprenants de se développer une banque de liens qui leur sera utile au-delà du cours, que ce soit pour leur propre apprentissage ou pour l'enseignement. Le cours est approprié aux apprenants de niveau intermédiaire ou avancé. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

### **FR ED 301 Rédaction professionnelle avancée**

★3 (*fi 6*) (l'un ou l'autre semestre, 0-4L-0). Ce cours est destiné aux personnes qui maîtrisent déjà la grammaire française. L'accent sera mis sur la rédaction de textes professionnels répondant à des buts spécifiques de communication (rapport annuel, lettre aux parents, chapitre de manuel, etc.). La pratique intense de l'écriture permettra à l'apprenant et l'apprenante d'approfondir ses connaissances du français écrit. Le clavardage ponctuel et continu entre l'apprenant / l'apprenante et l'animateur / l'animatrice permettra d'individualiser l'enseignement / l'apprentissage de la langue. Peut comprendre des sections Alternative Delivery; veuillez consulter

le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

## 231.144 French Language and Literature, FREN

Department of Modern Languages and Cultural Studies  
Faculty of Arts

### Notes

- (1) The Department reserves the right to place students in the language course appropriate to their level of language skill.
- (2) Placement tests may be administered in order to assess prior background. Students with a French language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in an advanced course more suitable to their level of ability. Students seeking to fulfill their Language Other than English requirement may begin at any one appropriate level, but must take the full ★6 in one language.
- (3) The Department will withhold credit from students completing courses for which prior background is deemed to make them ineligible. For example, 100-level courses are normally restricted to students with little or no prior knowledge in that language. Should a student with matriculation standing, or those possessing prior background (such as native speakers or those for whom it is their first language) register in the 100-level course, credit may be withheld.
- (4) FREN 311, 312, 313, 314, 315, 316 pursue mastery of the language and introduce students to the study of texts (e.g., literary, journalistic, cinematographic). The double focus allows for applied language development while providing an in-depth introduction to the study of major cultural texts.
- (5) See also listings under Modern Languages and Cultural Studies (MLCS).

### Undergraduate Courses

#### L FREN 111 Beginners' French I

★3 (fi 6) (either term, 5-0-0). Designed for students with little or no previous background in French. Covers material in matriculation-level French and allows students to proceed into the study of French at the University level. Note: not to be taken by students with credit in FREN 100, or with native or near native proficiency, or with French 30 or its equivalents in Canada and other countries.

#### L FREN 112 Beginners' French II

★3 (fi 6) (either term, 5-0-0). Prerequisite: FREN 111 or consent of Department. Note: not to be taken by students with credit in FREN 100, or with native or near native proficiency, or with French 30 or its equivalents in Canada and other countries.

#### L FREN 155 French Reading Comprehension I

★3 (fi 6) (either term, 3-0-0). A basic course in French grammar and literature designed to develop skills in reading French. Language of instruction is English. Prerequisite: French 30 or equivalent. Not to be taken by students with credit in FREN 150, 211 or 212. Note: Will not meet the requirements in a principal area of concentration.

#### L FREN 156 French Reading Comprehension II

★3 (fi 6) (either term, 3-0-0). An intermediate course in French grammar and literature. Language of instruction is English. Prerequisite: FREN 155 or consent of Department. Not to be taken by students with credit in FREN 150, 211 or 212. Note: Will not meet the requirements in a principal area of concentration.

#### O FREN 211 Intermediate French I

★3 (fi 6) (either term, 5-0-0). Spoken and written French, including grammar, composition, and literature. Prerequisite: French 30 (or equivalent) or FREN 112 or consent of Department. Note: not to be taken by students with credit in FREN 150.

#### O FREN 212 Intermediate French II

★3 (fi 6) (either term, 5-0-0). Prerequisite: FREN 211 or consent of Department. Note: not to be taken by students with credit in FREN 150.

#### FREN 224 French in North America

★3 (fi 6) (either term, 3-0-0). An introduction to French in North America from geo-historical, linguistic, literary, and cultural perspectives. Taught in English. This course will not fulfill the LOE requirement of the Faculty of Arts.

#### L FREN 254 Introduction to Translation Theory and Practice: French-English-French

★3 (fi 6) (either term, 3-0-0). Prerequisite: FREN 297. This course can also be applied to the MLCS Certificate in Translation Studies.

#### O FREN 297 Advanced French I

★3 (fi 6) (either term, 3-0-2). Designed to improve the student's command of French through intensive oral practice and advanced written exercises. Prerequisite: FREN 212 or consent of Department. Note: not to be taken by students with credit in FREN 251, 252 or FRANCO 165, 166, 210, 211.

#### O FREN 298 Advanced French II

★3 (fi 6) (either term, 3-0-2). Emphasis on the improvement of writing and speaking skills by means of numerous compositions based on texts read and discussed in class. Prerequisite: FREN 297 or consent of Department. Note: not to be taken by students with credit in FREN 252 or FRANCO 165, 166, 210, 211.

#### O FREN 301 Introduction to French Literary Studies

★3 (fi 6) (either term, 3-0-0). Tools necessary to conduct literary analyses and essay writing. Prerequisite: FREN 298.

#### O FREN 310 Composition, Style and Expression

★3 (fi 6) (either term, 3-0-0). Prerequisite: FREN 298 or consent of Department. Not to be taken by students with credit in FREN 352.

#### O FREN 311 Mystery, Myth, and Supernatural

★3 (fi 6) (either term, 3-0-0). Mythology, the supernatural, superstition as cultural and literary phenomena in the French-speaking world. Prerequisite: FREN 298.

#### O FREN 312 Colonialism and Postcolonialism

★3 (fi 6) (either term, 3-0-0). Francophone cultural texts from a post/colonial perspective, the socio-historical contexts of their production and their importance for definitions of cultural identity. Prerequisite: FREN 298.

#### O FREN 313 Passions/Obsessions

★3 (fi 6) (either term, 3-0-0). Two loosely connected themes that go back to the very origins of French as a language and continue to shape cultural expression in it. Prerequisite: FREN 298.

#### O FREN 314 Beauty/Aesthetics

★3 (fi 6) (either term, 3-0-0). Addresses either a given period or a particular facet of aesthetics. Prerequisite: FREN 298.

#### O FREN 315 Cultural Representations of Food

★3 (fi 6) (either term, 3-0-0). Functions and manifestations of the food paradigm in Francophone cinematographic and narrative texts. Prerequisite: FREN 298.

#### O FREN 316 Belonging (Migration and Identity)

★3 (fi 6) (either term, 3-0-0). Place and community; identity, belonging, exile. Prerequisite: FREN 298.

#### FREN 322 Historical Perspective on Canadian Theatre in French

★3 (fi 6) (either term, 3-0-0). The evolution of Canadian theatre, with a contemporary perspective on the history of francophone theatre in Canada and on the function of language in Quebec and Franco-Canadian drama. Prerequisite: FREN 298 or consent of Department. Note: not to be taken by students with credit in ADRAM 302.

#### FREN 333 French Cultural Moments

★3 (fi 6) (either term, 3-0-0). Uses the study of various intellectual and historical events to provide students with a window into the French world. Prerequisite: FREN 297 or consent of Department. Offered in La Rochelle, France only.

#### O FREN 346 Women Writing in French

★3 (fi 6) (either term, 3-0-0). Prerequisite or corequisite: FREN 301.

#### O FREN 354 Translation: French into English

★3 (fi 6) (either term, 3-0-0). Prerequisite: FREN 254 or consent of Department. Note: not to be taken by students with credit in FREN 353. This course can also be applied to the MLCS Certificate in Translation Studies.

#### FREN 355 Composition, Style and Expression in Context

★3 (fi 6) (either term, 3-0-0). Prerequisite: FREN 298 or 299. Note: not to be taken by students with credit in FREN 352.

#### O FREN 371 Language and Francophone Societies

★3 (fi 6) (either term, 3-0-0). Overview of the French language as it has evolved chronologically and geographically. Prerequisite: FREN 298.

#### O FREN 372 French Phonetics

★3 (fi 6) (either term, 3-0-0). Overview of the pronunciation of Standard French. Prerequisite: FREN 298 or consent of Department.

#### O FREN 399 Special Topics

★3 (fi 6) (either term, 3-0-0). Prerequisite: FREN 298.

#### FREN 445 Contemporary Cinema in French

★3 (fi 6) (either term, 3-0-0). Emphasis on the representation and evolution of society in French cinema of the last 20 years. Prerequisites: FREN 301 or FRANCO 225, and one of FREN 311, 312, 313, 314, 315, 316.

#### FREN 454 Translation: English into French

★3 (fi 6) (either term, 3-0-0). Prerequisite: FREN 354 or consent of Department. Note: This course can also be applied to the MLCS Certificate in Translation Studies.

#### FREN 462 Topics in Medieval and Early Modern Literature

★3 (fi 6) (either term, 3-0-0). Prerequisites: FREN 301 or FRANCO 225, and one of FREN 311, 312, 313, 314, 315, 316.

#### FREN 463 Topics in Nineteenth-Century Literature

★3 (fi 6) (either term, 3-0-0). Prerequisites: FREN 301 or FRANCO 225, and one of FREN 311, 312, 313, 314, 315, 316.



**FREN 464 Topics in Twentieth-Century Literature**

★3 (fi 6) (either term, 3-0-0). Prerequisites: FREN 301 or FRAN 225, and one of FREN 311, 312, 313, 314, 315, 316.

**FREN 465 Caribbean Culture**

★3 (fi 6) (either term, 3-0-0). Colonialism, identity, diaspora and cultural diversity in French Caribbean literature, films, and music. Prerequisites: FREN 301 or FRAN 225, and one of FREN 311, 312, 313, 314, 315, 316.

**FREN 466 The Maghreb**

★3 (fi 6) (either term, 3-0-0). Colonialism, identity, diaspora and cultural diversity in contemporary French Maghrebi literature. Prerequisites: FREN 301 or FRAN 225, and one of FREN 311, 312, 313, 314, 315, 316.

**FREN 467 Women Writing in French**

★3 (fi 6) (either term, 3-0-0). Texts written in various Francophone parts of the world from different periods. Prerequisites: FREN 301 or FRAN 225, and one of FREN 311, 312, 313, 314, 315, 316.

**FREN 468 Topics in Quebec/French Canadian Literature**

★3 (fi 6) (either term, 3-0-0). Prerequisites: FREN 301 or FRAN 225, and one of FREN 311, 312, 313, 314, 315, 316.

**FREN 473 Canadian French**

★3 (fi 6) (either term, 3-0-0). An overview of Canadian French, looking at its historical development as well its present-day structure. The course is intended to familiarize students with the spoken features of the varieties of French spoken within Canada in order that they may have a greater knowledge of Canadian French and a greater facility understanding it. Prerequisite: FREN 372 or consent of Department.

**FREN 476 Linguistics Applied to French**

★3 (fi 6) (either term, 3-0-0). Selected topics in French linguistics that enhance the acquisition of French as a Second Language. Prerequisites: FREN 301 or FRAN 225, and one of FREN 311, 312, 313, 314, 315, 316.

**FREN 495 Honors Thesis**

★3 (fi 6) (either term, 0-3s-0).

**FREN 499 Special Topics**

★3 (fi 6) (either term, 3-0-0).

**Graduate Courses****FREN 518 French Translation Seminar**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

**FREN 529 Studies in Francophone Literature Outside France**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**FREN 545 Contemporary Cinema in French**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**FREN 554 Translation: English into French**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**FREN 560 Studies in 18th-Century French Literature**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**FREN 563 Topics in Nineteenth-Century Literature**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**FREN 564 Topics in Twentieth-Century Literature**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**FREN 565 Caribbean Culture**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**FREN 566 The Maghreb**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**FREN 567 Women Writing in French**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**FREN 568 Topics in Québec/French Canadian Literature**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**FREN 573 Canadian French**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**FREN 576 Linguistics Applied to French**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**FREN 580 Children's Literature In French**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**FREN 599 Directed Reading**

★3 (fi 6) (either term, 3-0-0).

**FREN 601 Special Topics in Literary Translation**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department. Note: Restricted to students enrolled in the MA in French Translation program.

**FREN 622 Seminar in French Theatre**

★3 (fi 6) (either term, 3-0-0).

**FREN 698 Topics in French Linguistics**

★3 (fi 6) (either term, 3-0-0).

**FREN 699 Topics in French Literature and Culture**

★3 (fi 6) (either term, 3-0-0).

**231.145 Genetics (Biological Sciences), GENET**

Department of Biological Sciences  
Faculty of Science

**Notes**

- (1) See the following sections for listings of other Biological Sciences courses: Bioinformatics (BIOIN); Biology (BIOL); Botany (BOT); Entomology (ENT); Microbiology (MICRB); Zoology (ZOO).
- (2) See the following sections for listings of other relevant courses: Interdisciplinary Studies (INT D); Immunology and Infection (IMIN); Marine Science (MA SC); Paleontology (PALEO).

**Undergraduate Courses****O GENET 270 Foundations of Molecular Genetics**

★3 (fi 6) (either term, 3-1.5s-0). Basic concepts on the organization of genetic material and its expression will be developed from experiments on bacteria and viruses. Prerequisite: BIOL 207.

**O GENET 301 Organization of Simple Genomes**

★3 (fi 6) (first term, 3-0-0). Two models of simple genomes will be examined. One model will focus on the function and transmission of mitochondrial DNA, the evolution of mitochondria, and the role of mitochondria in human disease and aging. The other model will focus on the application of genomics, molecular biology, and cell biology to understand chromosome structure, DNA replication, cell division, and cell-cell communication in yeast. Prerequisite: GENET 270.

**O GENET 302 Organization of Complex Genomes**

★3 (fi 6) (second term, 3-0-0). Use of current genomics in Eukaryote genome sequencing projects, their implications and DNA sequence organization. Also covered are the influence of various chromatin configurations on gene expression, techniques for manipulating animal genomes, epigenetic phenomena, and regulation of the cell cycle. Prerequisite: GENET 270.

**O GENET 304 Gene Expression and its Regulation**

★3 (fi 6) (first term, 3-0-0). The molecular biology of the processes by which the base sequence of genes is expressed as cellular phenotype will be examined. Emphasis will be placed upon the similarities and differences between prokaryotes and eukaryotes and upon the mechanisms that regulate the operation of particular genes. Prerequisite: GENET 270.

**O GENET 305 Genetic Analysis**

★3 (fi 6) (second term, 3-0-0). Analysis of gene functions in animal model systems. Mutational analysis; gene dosage; chromosome mechanics; transgenics; forward and reverse screens; dominant modifier screens; epistasis; genetic mosaics, meiotic recombination. Prerequisite: GENET 270. Credit cannot be obtained for both GENET 275 and 305.

**O GENET 364 Plant Genetics**

★3 (fi 6) (second term, 3-0-0). This course examines in detail: how to induce mutations in plants by means of chemicals and transgenes; how to use mutagenized and transgenic plant populations for forward and reverse genetic approaches; how to molecularly identify genes defined by mutations in plants; how to infer gene functions and genetic interactions from single and double-mutant phenotypes, respectively, with emphasis on genetic redundancy and functional compensation; and how to visualize gene expression and protein localization with fluorescent proteins. Prerequisite: GENET 270.

**O GENET 375 Introduction to Molecular Genetics Techniques**

★3 (fi 6) (second term, 0-1s-6). A laboratory course in which students will be introduced to modern techniques in molecular genetics. These may include cytogenetics, recombinant DNA techniques, PCR, DNA sequencing, methods of detecting gene expression, and genome analysis. Prerequisites: GENET 270, MICRB 265, and a 300-level GENET course. Enrolment is limited, and registration is by consent of instructor.

**O GENET 390 Gene Manipulation**

★3 (fi 6) (first term, 3-0-0). Examination of fundamental techniques employed in molecular biological research relevant to both prokaryotic and eukaryotic systems. Topics will provide the theoretical basis appropriate for molecular research in a diverse range of fields including genetics, microbiology, cell biology, biotechnology, evolution and population biology. Prerequisite: BIOL 207; BIOCH 200 or 205 or BIOCH 220; GENET 270 recommended.

**O GENET 408 Replication, Repair, and Recombination**

★3 (fi 6) (first term, 3-1s-0). The goal of the course is to build a foundation of information in the topics of DNA replication, recombination, and repair and to

apply this information to understanding the molecular basis of certain human diseases including cancer. Prerequisites: Any two GENET 300-level lecture courses; this course is normally recommended for fourth-year students. GENET 408 and 508 cannot both be taken for credit.

#### **O GENET 412 Genetic Control of Animal Development**

★3 (*fi 6*) (first term, 3-1s-0). Gene action during development; identification and analysis of the networks of genetic elements regulating developmental decisions. The course will focus on processes that have been elucidated from genetically tractable and model systems. Prerequisites: any two GENET 300-level lecture courses, or any GENET 300-level lecture course and ZOO 303. Credit cannot be obtained for both GENET 412 and 512.

#### **O GENET 418 Human Genetics**

★3 (*fi 6*) (second term, 3-1s-0). A survey of human genetic variation and mutation in a molecular genetics context. Molecular basis of diseases and applications to genetic counseling and screening, chromosomal abnormalities, genomic imprinting, cancer genetics, gene mapping, population genetics, multifactorial inheritance, gene therapy, and ethical issues. Prerequisites: any two GENET 300-level lecture courses, GENET 302 is recommended. Credit cannot be obtained for both GENET 418 and 518.

#### **GENET 420 Research Techniques in Molecular Genetics**

★6 (*fi 12*) (either term, 0-1s-12). A laboratory course teaching modern techniques in molecular biology with emphasis on the analysis of gene expression in animal systems. Prerequisites: GENET 390 and any other GENET 300-level lecture course. GENET 375 recommended. Enrolment is limited and registration is by consent of instructor. Designed for senior undergraduate and graduate students in programs with molecular biological orientation. May not be taken concurrently with BIOL 391.

#### **GENET 422 Current Topics in Developmental Genetics**

★3 (*fi 6*) (either term, 0-3s-0). Discussion of selected topics in developmental biology with an emphasis on the cellular and genetic mechanisms used to uncover regulatory pathways. Selection of topics will depend, in part, on the interests of the students enrolled. Peer evaluation will be an integral part of the course and an introduction to the review process in science will be included. Critical reading and analysis of the primary literature, research proposal-based reading and writing, and classroom presentation skills may all be used as means of evaluation. Prerequisites: consent of instructor and GENET 412 or ZOO 303 or equivalent course in developmental biology.

#### **GENET 424 Ethical Issues in Genetics**

★3 (*fi 6*) (second term, 0-3s-0). A seminar and discussion course where students will use their existing knowledge of genetics to investigate, evaluate, and discuss how the field of genetics affects society. Students participate in classroom presentations, written submissions and discussions that may include medical research ethics, genetically modified organisms (GMOs), gene patenting, and other current topics. Enrollment is limited and is by permission of the instructor(s). Prerequisite: Any two GENET 300-level lecture courses.

## Graduate Courses

### Notes

- (1) All 300- and 400-level courses in the Department of Biological Sciences may be taken for credit (except for BIOL 490, 498 and 499) by graduate students with approval of the student's supervisor or supervisory committee.
- (2) The following courses may be taken as an option in the Department of Biological Sciences with approval of the student's supervisor or supervisory committee: BIOCH 510, 520, 530, 541, 550, 555, 560; CHEM 361, 363, 461; CELL 300, 301; ENCS 510; IMIN 371, 372, 452, 501; MA SC 400, 401, 402, 410, 412, 420, 425, 430, 437, 440, 445, 470, 480; MMI 405, 415, NEURO 472; NU FS 363; PALEO 418, 419; PHARM 601.

#### **GENET 500 Advanced Genetic Analysis I: The Genetic System**

★3 (*fi 6*) (first term, 3-3s-0). Directed study of literature on the discovery of the phenomena of inheritance and their physical correlates within the cell. Notes: (1) Graded on participation in group discussions and on written work and/or examinations based on assigned readings. (2) Scheduling of this course will be subject to modification depending on the requirements of instructors and students. Note: Usually taken as one of a pair of courses (GENET 500, 510) by first year graduate students in the area of Genetics. Students in other graduate programs may register with the consent of the instructors.

#### **GENET 508 Graduate Course in Replication, Repair and Recombination**

★3 (*fi 6*) (first term, 3-1s-0). The goal of the course is to build a foundation of information in the topics of DNA replication, recombination, and repair and to apply this information to understanding the molecular basis of certain human diseases including cancer. Scheduled classes are the same as GENET 408, but with additional assignments and evaluation appropriate to graduate studies. Prerequisite: consent of instructor. Credit cannot be obtained for both GENET 408 and 508.

#### **GENET 510 Advanced Topics in Gene Regulation, Development and Medical Genetics**

★3 (*fi 6*) (second term, 3-3s-0). Directed study of literature on regulation of

the phenotypic expression of genes and the manner in which genes direct the process of development. Note: See GENET 500.

#### **GENET 512 Advance Genetic Control of Animal Development**

★3 (*fi 6*) (first term, 3-1s-0). Gene action during development; identification and analysis of the network of genetic elements regulating developmental decisions. The course will focus on processes that have been elucidated from genetically tractable and model systems. Scheduled classes are the same as GENET 412, but with additional assignments and evaluation appropriate to graduate studies. Prerequisite: consent of instructor. Credit cannot be obtained for both GENET 412 and 512.

#### **GENET 518 Advanced Human Genetics**

★3 (*fi 6*) (second term, 3-1s-0). A survey of human genetic variation and mutation in a molecular genetics context. Molecular basis of diseases and applications to genetic counseling and screening, chromosomal abnormalities, genomic imprinting, cancer genetics, gene mapping, population genetics, multifactorial inheritance, gene therapy, and ethical issues. Scheduled classes are the same as GENET 418, but with additional assignments and evaluation appropriate to graduate studies. Prerequisite: consent of instructor. Credit cannot be obtained for both GENET 418 and 518.

#### **GENET 601 Genetics Seminars**

★1 (*fi 2*) (either term, 0-1s-0).

#### **GENET 605 Invited Speaker Seminar Series**

★1 (*fi 2*) (either term, 0-2s-0).

## 231.146 Geophysics, GEOPH

Department of Physics  
Faculty of Science

**Note:** Not all Geophysics courses are offered every year. Students are advised to consult the Department of Physics regarding the courses that will be available in a given year. GEOPH 436, the geophysics field school, is normally held in the week prior to the start of Fall term, and is required for Honors and Specialisation Geophysics programs. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

## Undergraduate Courses

#### **O GENET 110 Introduction to Geophysics**

★3 (*fi 6*) (either term, 3-0-0). Introduction to both whole Earth geophysics and commercial exploration geophysics. Topics include: earthquakes, seismology, gravity and the shape of the Earth, plate tectonics, atmospheric and space physics, geomagnetic field, geochronology, geoelectricity, geothermal studies, comparison of Earth with other planets, Sun-Earth interactions, and discussion of geophysics as a career. Prerequisites: Physics 20 and Mathematics 30. Note: Credit will be given for only one of GEOPH 110 or 210.

#### **O GENET 210 Physics of the Earth**

★3 (*fi 6*) (either term, 3-0-0). Structure and evolution of the Earth from a physics-based perspective; use of geophysical data (gravity, magnetic, seismic, thermal, geoelectric) to determine the internal structure of the Earth; dynamics of the Earth, including plate tectonics, mantle convection and the geodynamo; geohazards, volcanos, earthquakes and magnetic storms; temporal variations in climate and sea level. Prerequisites: one of MATH 101, 115, 118; one of PHYS 126, 146, EN PH 131. SCI 100 may be used in lieu of MATH 115 and PHYS 126 or 146. Note: credit will be given for only one of GEOPH 110 or GEOPH 210.

#### **O GENET 223 Environmental Geophysics**

★3 (*fi 6*) (either term, 3-0-3). Near surface geophysical imaging techniques with focus on applications in hydrogeology, glaciology and environmental studies; rock properties; imaging methods covered include: shallow seismic exploration, magnetic exploration, radiometric techniques, electrical resistivity tomography (ERT); electromagnetic (EM) methods; ground penetrating radar (GPR), application to environmental monitoring, climate change, environmental legislation. Prerequisites: one of MATH 101, 115, 118; one of PHYS 126, 146, EN PH 131. SCI 100 may be used in lieu of MATH 115 and PHYS 126 or 146. Note: Offered alternate years only. Consult Department for course schedule.

#### **O GENET 224 Geophysical Exploration Techniques**

★3 (*fi 6*) (either term, 3-0-3). Geophysical exploration with focus on techniques relevant to hydrocarbon and mineral exploration; gravity and magnetic exploration techniques; basics of seismic wave propagation in Earth; seismic data processing; the geological interpretation of seismic reflection and refraction data. Prerequisites: one of MATH 101, 115, 118; one of PHYS 126, 146, EN PH 131. SCI 100 may be used in lieu of MATH 115 and PHYS 126 or 146. Note: Not available to students in Honors or Specialization Geophysics. Note: offered alternate years only. Consult Department for course schedule.

#### **O GENET 325 Gravity, Magnetic, and Electrical Geophysics**

★3 (*fi 6*) (either term, 3-0-3/2). Theory of gravity, shape of the earth, nature of the geomagnetic field, magnetic, and electrical exploration methods; factors

controlling density, resistivity, and magnetic properties of rocks; applications in environmental geophysics, continental dynamics and mineral exploration; instrumentation. Analysis of gravity, magnetic and resistivity data. Prerequisite: PHYS 281 or 230, MATH 215 or 209 or 317.

#### **0** GEOPH 326 Seismic Imaging

★3 (fi 6) (either term, 3-0-3/2). Use of reflection and refraction seismology to image the Earth's interior, with application to gas/oil and mineral exploration and environmental assessment; study of current technologies utilized to acquire, image and interpret 2D and 3D data sets. Real data sets and computer assignments will be used to produce seismic images of the subsurface. Prerequisite: PHYS 281 or 230, MATH 215 or 209 or 317.

#### **0** GEOPH 332 Physical Properties of Geomaterials

★3 (fi 6) (either term, 3-0-0). Overview of the fundamental physical properties of geophysically important materials; physics involved in the measurement of physical properties in the Earth especially in the context of geophysical well logging and laboratory measurement; integration of measurements with geological and geophysical field observations. Prerequisites: PHYS 271 or 208, 281 or 230, MATH 215 or 209 or 317.

#### **0** GEOPH 421 Seismology and the Physical Structure of the Earth

★3 (fi 6) (either term, 3-0-0). Seismology; solutions to the elastic wave equation in layered media; three-component seismic field and ray theory; body and surface waves; normal modes and free oscillations; source mechanism; structure of the Earth; seismometers; inversion of seismic data. Pre or corequisite: Math 334. Prerequisites: PHYS 281.

#### **0** GEOPH 424 Electromagnetic Methods in Geophysics

★3 (fi 6) (either term, 3-0-3/2). Theory and application of Maxwell's equations to geophysics; resistivity of rocks, electromagnetic exploration; magnetotellurics, frequency and time domain EM methods, forward and inverse techniques to image crustal and mantle structures. Analysis of EM data collected at field school. Pre- or corequisite: MATH 337. Prerequisites: PHYS 281 or 230, 381, GEOPH 325.

#### **0** GEOPH 426 Signal Processing in Geophysics

★3 (fi 6) (either term, 3-0-0). Application of time series analyses and image processing techniques to large geophysical data sets; sampling of data and problems of aliasing; one and two dimensional Fourier transforms; the Z transformation; spectral analysis, filtering, and deconvolution; application of 1D and 2D filtering to seismic and gravity/magnetic data analysis. Prerequisites: MATH 311, GEOPH 326, PHYS 234 or equivalent.

#### **0** GEOPH 431 Geophysical Inverse Theory

★3 (fi 6) (either term, 3-0-0). Quantitative methods to determine the physical properties of the Earth from indirect geophysical observations; formal treatment of geophysical inverse theory; topics include linear and nonlinear inverse problems, regularization techniques, model norms and misfit, tomography, and case histories of interpretation and analysis. Prerequisites: PHYS 234, 381, MATH 311, 337, GEOPH 325, 326 or permission of instructor.

#### **0** GEOPH 436 Geophysics Field School

★3 (fi 6) (first term, 10 days). Students conduct a wide variety of geophysical measurements in a field situation. The field school is run immediately prior to the fall term. "Requires payment of additional student instructional support fees." Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisites: GEOPH 325 and 326, or consent of instructor. Intended for students in a Specialization or Honours Geophysics program. Students in other programs should contact the Department of Physics for permission. Note: this course is graded on a credit/no credit basis.

#### **0** GEOPH 438 Seismic Data Processing

★3 (fi 6) (either term, 0-0-6). A variety of seismic and ground penetrating radar data sets are obtained by the student during field school; these data are corrected, enhanced, and imaged in a computer workstation laboratory, leading to a final geologic interpretation. Results obtained by the student will be presented in the format of a series of professional technical reports. Prerequisites: MATH 209, 214, or equivalent, GEOPH 326, PHYS 234 or equivalent. Pre- or corequisite: GEOPH 426 and 436 (field school).

#### **0** GEOPH 440 Global Geodynamics

★3 (fi 6) (either term, 2-1s-0). Topics to be discussed include plate tectonics, continental breakup and assembly; faulting and earthquakes; mantle and lithosphere rheology; global gravity and Earth's rotation; heat transfer and convection in the Earth and planets; hotspots and mantle plumes, plate accretion and subduction; dynamics of the core, planetary magnetism and the geodynamo. Pre- or corequisite: MATH 337. Prerequisites: PHYS 281.

## Graduate Courses

The following undergraduate courses may be taken for credit by graduate students: GEOPH 421, 438.

#### **0** GEOPH 521 Global Geodynamics

★3 (fi 6) (either term, 2-1s-0). Topics to be discussed include plate tectonics, continental breakup and assembly; faulting and earthquakes; mantle and lithosphere

rheology; global gravity and Earth's rotation; heat transfer and convection in the Earth and planets; hotspots and mantle plumes, plate accretion and subduction; dynamics of the core, planetary magnetism and the geodynamo. Prerequisite: Consent of instructor.

#### **0** GEOPH 524 Electromagnetic Methods in Geophysics

★3 (fi 6) (either term, 3-0-3/2). Theory and application of Maxwell's equations to geophysics; resistivity of rocks, electromagnetic exploration; magnetotellurics, frequency and time domain EM methods, forward and inverse techniques to image crustal and mantle structures. Analysis of EM data collected at field school. Prerequisite: Consent of instructor. Note: This course cannot be taken for credit if credit has already been given for GEOPH 424.

#### **0** GEOPH 526 Signal Processing in Geophysics

★3 (fi 6) (either term, 3-0-0). Application of time series analyses and image processing techniques to large geophysical data sets; sampling of data and problems of aliasing; one and two dimensional Fourier transforms; the Z transformation; spectral analysis, filtering, and deconvolution; application of computers in assignments. Note: This course cannot be taken for credit if credit has already been given for GEOPH 426.

#### **0** GEOPH 531 Geophysical Inverse Theory

★3 (fi 6) (either term, 3-0-0). Quantitative methods to determine the physical properties of the Earth from indirect geophysical observations; formal treatment of geophysical inverse theory; topics include linear and nonlinear inverse problems, regularization techniques, model norms and misfit, tomography, and case histories of interpretation and analysis. Note: This course cannot be taken for credit if credit has already been given for GEOPH 431.

#### **0** GEOPH 538 Seismic Data Processing

★3 (fi 6) (either term, 0-0-6). A variety of seismic and ground penetrating radar data sets are obtained during field school; these data are corrected, enhanced, and imaged in a computer workstation laboratory, leading to a final geologic interpretation. Results obtained by the student will be presented in the format of a series of professional technical reports. Note: This course cannot be taken for credit if credit has already been given for GEOPH 438.

#### **0** GEOPH 612 Paleomagnetism

★3 (fi 6) (either term, 3-0-0).

#### **0** GEOPH 620 Rock Physics

★3 (fi 6) (either term, 3-0-0).

#### **0** GEOPH 624 Theoretical Seismology

★3 (fi 6) (either term, 3-0-0).

## 231.147 German, GERM

Department of Modern Languages and Cultural Studies  
Faculty of Arts

### Notes

- (1) The Department reserves the right to place students in the language course appropriate to their level of language skill.
- (2) Placement tests may be administered in order to assess prior background. Students with a German language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in an advanced course more suitable to their level of ability. Students seeking to fulfill their Language Other than English requirement may begin at any one appropriate level, but must take the full ★6 in one language.
- (3) The Department will withhold credit from students completing courses for which prior background is deemed to make them ineligible. For example, 100-level courses are normally restricted to students with little or no prior knowledge in that language. Should a student with matriculation standing, or those possessing prior background (such as native speakers or those for whom it is their first language) register in the 100-level course, credit may be withheld.
- (4) See also listings under Modern Languages and Cultural Studies (MLCS) and Scandinavian (SCAND)

## Undergraduate Courses

#### **0** GERM 111 Beginners' German I

★3 (fi 6) (either term, 5-0-0). Designed to lead to mastery of spoken and written German. Note: not to be taken by students with credit in GERM 100, or with native or near native proficiency, or with German 30 or its equivalents in Canada and other countries.

#### **0** GERM 112 Beginners' German II

★3 (fi 6) (either term, 5-0-0). Prerequisite: GERM 111 or consent of Department. Note: not to be taken by students with credit in GERM 100, or with native or near native proficiency, or with German 30 or its equivalents in Canada and other countries.

#### **0** GERM 165 Reading German for Beginners

★6 (fi 12) (two term, 3-0-0). An intensive course to give beginning students a



reading knowledge of German in the sciences, the arts and the humanities. Note: Not to be taken by students with credit in German 30, or GERM 100, 101, 111 or 112. Will not meet the requirements in a principal area of concentration.

**O GERM 211 Intermediate German I**

★3 (fi 6) (either term, 5-0-0). Designed to develop ability in speaking, reading and writing German, using modern short stories, cultural readers and audiovisual aids. Prerequisite: German 30 (or equivalent) or GERM 112 or consent of Department. Note: not to be taken by students with credit in GERM 150.

**O GERM 212 Intermediate German II**

★3 (fi 6) (either term, 5-0-0). Prerequisite: GERM 211 or consent of Department. Note: not to be taken by students with credit in GERM 150.

**GERM 225 Germany on Screen**

★3 (fi 6) (either term, 3-0-3). A survey of cinematic movements in Germany from the birth of film to the new millennium within its historical, social, or political context. Taught in English. This course will not fulfill the LOE requirement of the Faculty of Arts.

**O GERM 265 Advanced Reading German**

★6 (fi 12) (two term, 3-0-0). Reading of advanced texts in the sciences, the arts and the humanities. Systematic discussion of complex constructions which are characteristic of technical and scholarly literature. Prerequisite: German 30, GERM 100, 101, 112, 165 or their equivalents. Will not meet the requirements in a principal area of concentration.

**O GERM 274 The Culture and Civilization of Austria: An Introduction**

★3 (fi 6) (either term, 3-0-0). The cultural legacy of Austria from the Habsburgs to the present. This course is taught in English and does not fulfil the language-other-than-English requirement of the BA degree.

**O GERM 303 Advanced German I**

★3 (fi 6) (either term, 4-0-0). Conversation and writing through films, news items, short stories and plays. Prerequisite: GERM 212 or consent of Department. Note: not to be taken by students with credit in GERM 301.

**O GERM 304 Advanced German II**

★3 (fi 6) (either term, 4-0-0). Prerequisite: GERM 303 or consent of Department. Note: not to be taken by students with credit in GERM 301.

**O GERM 306 Introduction to German Linguistics: Phonetics and Phonology**

★3 (fi 6) (either term, 3-0-0). Phonetic and phonemic analysis of English and German. Contrastive study includes application to teaching and learning. Prerequisite: GERM 212 or consent of Department. Note: This course will not fulfill the Language other than English requirement.

**O GERM 309 Introduction to German Linguistics: Morphology, Syntax, and Semantics**

★3 (fi 6) (either term, 3-0-0). Prerequisite: GERM 212 or consent of Department. Not to be taken by students with credit in GERM 307 or 308. Note: this course will not fulfill the Language other than English requirement of the BA.

**O GERM 316 Introduction to German Applied Linguistics**

★3 (fi 6) (either term, 3-0-0). Discussion of concepts in multilingualism, contrastive analysis, sociolinguistics, and pragmalinguistics as related to the study of German. Prerequisite: GERM 212 or consent of Department.

**O GERM 317 Practical Aspects of German Applied Linguistics**

★3 (fi 6) (either term, 3-0-0). Grammar models and their application to language learning and teaching, error analysis, contrastive stylistics, translation, languages for special purposes, and cultural studies. Prerequisite: GERM 212 or consent of Department.

**GERM 320 Contemporary German Narrative**

★3 (fi 6) (either term, 3-0-0). Literary prose texts in English translation that reflect developments in contemporary German culture and literature. Taught in English. This course will not fulfill the LOE requirement of the Faculty of Arts. Prerequisite: consent of the Department.

**GERM 325 Critical Approaches to German Film**

★3 (fi 6) (either term, 3-0-3). Taught in English. This course will not fulfill the LOE requirement of the Faculty of Arts. Prerequisite: GERM 225 or equivalent, or consent of the Department.

**O GERM 333 Modern Culture in the Making: 1750-1945**

★3 (fi 6) (either term, 3-0-0). Cultural developments in the German-speaking world from the Age of Enlightenment. Prerequisite: GERM 212 or consent of Department.

**GERM 340 Introduction to the Study of Modern German Literature**

★3 (fi 6) (first term, 3-0-0). Literary and cultural developments on the basis of textual examples from German Classicism in the German-speaking. Prerequisite: GERM 212, corequisite GERM 303 or consent of Department. Not to be taken by students with credit in GERM 352.

**GERM 343 Postwar Cultures**

★3 (fi 6) (either term, 3-0-0). Developments in society, politics, and popular as

well as high culture from 1945 to the present in Germany, Austria, and Switzerland. Prerequisite: GERM 212 or consent of Department. Not to be taken by students with credit in GERM 341, or 342.

**O GERM 351 Introduction to German Literary and Cultural Studies I**

★3 (fi 6) (either term, 3-0-0). Deals with highlights of the German literary and cultural development on the basis of textual examples from Germanic times to the 18th century. Pre- or corequisite: GERM 303 or consent of Department.

**O GERM 352 Introduction to German Literary and Cultural Studies II**

★3 (fi 6) (either term, 3-0-0). Deals with highlights of German literary and cultural development on the basis of textual examples from German Classical Weimar to the present. Pre- or corequisite: GERM 303 or consent of Department.

**GERM 353 Myths, Tales, and Legends**

★3 (fi 6) (either term, 3-0-0). Storytelling throughout the German-speaking world from the medieval period, focusing on the development and proliferation of oral and written myths, tales, and legends. Prerequisite: GERM 212 or consent of Department.

**GERM 399 Special Topics**

★3 (fi 6) (either term, 3-0-0). Prerequisite: GERM 212 or consent of Department.

**GERM 402 Advanced German Composition, Conversation, and Grammar**

★3 (fi 6) (either term, 3-0-0). Prerequisite: GERM 304 or consent of Department. Not to be taken by students with credit in GERM 442. Note: This course can also be applied to the MLCS Certificate in Translation Studies.

**GERM 404 German for Business I**

★3 (fi 6) (either term, 3-0-0). Advanced German, both spoken and written skills, for the German business world. Prerequisite: GERM 304 or consent of Department. Note: not to be taken by students with credit in GERM 311 or 312.

**GERM 405 German For Business II**

★3 (fi 6) (either term, 3-0-0). Continuation of GERM 404. Prerequisite: GERM 304 and 404 or consent of Department. Note: not to be taken by students with credit in GERM 311 or 312.

**GERM 409 German Dialects**

★3 (fi 6) (either term, 3-0-0). A close look at some widely differing German dialects. Basic principles of German dialectology. Prerequisite: One of GERM 306, 316, 317, or consent of Department.

**GERM 416 Second Language Acquisition: German**

★3 (fi 6) (either term, 3-0-0). The course deals with the principles and processes in structured and unstructured language learning and with the different hypotheses and theories concerning language learning, in particular German. Prerequisite: One of GERM 306, 309, 316, 317, or consent of Department.

**GERM 417 German Sociolinguistics**

★3 (fi 6) (either term, 3-0-0). This course introduces students to sociolinguistic research with a special focus on learning German. The social status of a language and its effects on a learner, the use of dialects and gender-specific language in English and German will be discussed. Prerequisite: One of GERM 306, 309, 316, 317, 416, or consent of Department.

**GERM 441 Introduction to Translation: German into English**

★3 (fi 6) (either term, 3-0-0). Theory and practice of translation of texts in contemporary and classical German literature. Prerequisite: GERM 304 or consent of Department. Note: This course can also be applied to the MLCS Certificate in Translation Studies.

**GERM 443 Advanced Translation: German into English**

★3 (fi 6) (either term, 3-0-0). Theories, methods, and strategies of advanced translation. Prerequisite: GERM 441 or consent of Department. Note: This course can also be applied to the MLCS Certificate in Translation Studies.

**GERM 444 Exercises in Translation: English into German**

★3 (fi 6) (either term, 3-0-0). Theory and practice of translation of texts in a variety of genres. Prerequisite: GERM 304. Note: not to be taken by students with credit in GERM 442. This course can also be applied to the MLCS Certificate in Translation Studies.

**GERM 470 Women in German Literature**

★3 (fi 6) (either term, 3-0-0). Selected writings by women and about women from various historical periods and genres. Selected historical periods and texts may vary in any given year. Prerequisites: GERM 351 or 352 or consent of Department.

**GERM 475 Studies in German Drama I**

★3 (fi 6) (either term, 3-0-0). Major developments in German drama to the early 19th century, with special attention to drama of the Enlightenment, the Storm and Stress, and the Classical Period. Prerequisites: GERM 351 or 352 or consent of Department.

**GERM 476 Studies in German Drama II**

★3 (fi 6) (either term, 3-0-0). Major developments in German drama in the 19th and 20th centuries, with special attention to dramas of Realism, Naturalism, Expressionism, and epic and contemporary theatre. Prerequisites: GERM 351 or 352 or consent of Department.

**GERM 480 Studies in German Prose**

★3 (fi 6) (either term, 3-0-0). Major developments in German prose through to the late 19th century, with special attention to works representing German Classicism, Romanticism, Realism, and Naturalism. Prerequisites: GERM 351 or 352 or consent of Department.

**GERM 485 Studies in German Literature I**

★3 (fi 6) (either term, 3-0-0). German literary texts from the perspective of a specific topic, theme, or problem (e.g. social unrest and reform, or nationalism). Prerequisites: GERM 351 or 352 or consent of Department.

**GERM 486 Studies in German Literature II**

★3 (fi 6) (either term, 3-0-0). German literary texts from the perspective of a specific topic, theme, or problem proposed (e.g. heroes, history and rebellion, or modern science and the scientist). Prerequisites: GERM 351 or 352 or consent of Department.

**GERM 491 Teaching German in the Post-Secondary Classroom**

★3 (fi 6) (either term, 3-0-0). A German applied linguistics course for senior undergraduate and graduate-level students in German who are considering a career in post-secondary German studies. It focuses on the theories, strategies, and different aspects of teaching German as a foreign language at the post-secondary level. The course differs from other language-teaching courses by focusing specifically on German and by addressing the needs and practices of post-secondary specialists. Prerequisite: GERM 304 or consent of Department.

**GERM 492 German Discourse Analysis**

★3 (fi 6) (either term, 3-0-0). Theories and methodologies of analyzing German texts from a linguistic perspective. Prerequisite: GERM 304 or consent of Department.

**GERM 495 Honors Thesis**

★3 (fi 6) (either term, 0-3s-0).

**GERM 499 Special Topics**

★3 (fi 6) (either term, 3-0-0).

**Graduate Courses****GERM 514 German Dialects**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**GERM 518 Second Language Acquisition: German**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**GERM 591 Teaching German in the Post-Secondary Classroom**

★3 (fi 6) (either term, 3-0-0). A German applied linguistics course for senior undergraduate and graduate-level students in German who are considering a career in post-secondary German studies. Focuses on the theories, strategies, and different aspects of teaching German as a foreign language at the post-secondary level. The course differs from other language-teaching courses by focusing specifically on German and by addressing the needs and practices of post-secondary specialists. Prerequisite: consent of Department.

**GERM 592 German Discourse Analysis**

★3 (fi 6) (either term, 3-0-0). Theories and methodologies of analyzing German texts from a linguistic perspective. Prerequisite: consent of Department.

**GERM 599 Directed Reading**

★3 (fi 6) (either term, 3-0-0).

**GERM 640 Texts, Contexts, Theories**

★3 (fi 6) (either term, 3-0-0). Literary and other texts explored under consideration of a variety of critical theories.

**GERM 641 German Cultural Studies**

★3 (fi 6) (either term, 3-0-0). German-language culture, including visual, pop, print, material, or media culture, from a variety of theoretical angles.

**GERM 670 Women in German Literature**

★3 (fi 6) (either term, 3-0-0).

**GERM 675 Studies in German Drama I**

★3 (fi 6) (either term, 3-0-0).

**GERM 676 Studies in German Drama II**

★3 (fi 6) (either term, 3-0-0).

**GERM 680 Studies in German Prose**

★3 (fi 6) (either term, 3-0-0).

**GERM 685 Studies in German Literature I**

★3 (fi 6) (either term, 3-0-0).

**GERM 686 Studies in German Literature II**

★3 (fi 6) (either term, 3-0-0).

**GERM 698 Topics in Germanic Linguistics**

★3 (fi 6) (either term, 3-0-0).

**GERM 699 Topics in German Literature and Culture**

★3 (fi 6) (either term, 3-0-0).

The most current Course Listing is available on Bear Tracks.

**231.148 Greek, GREEK**

Department of History and Classics  
Faculty of Arts

**Notes**

- (1) Prerequisite for all 400-level Greek courses: GREEK 302 or consent of Department.
- (2) For additional related courses see Classics (CLASS) and Latin (LATIN) listings.

**Undergraduate Courses****O GREEK 101 Beginners' Greek I**

★3 (fi 6) (either term, 3-0-1). Elements of Classical Greek grammar and the reading of simple texts. Not open to students with credit in matriculation-level Greek.

**O GREEK 102 Beginners' Greek II**

★3 (fi 6) (either term, 3-0-1). A continuation of GREEK 101. Prerequisite: GREEK 101 or consent of Department.

**O GREEK 301 Intermediate Greek I**

★3 (fi 6) (either term, 3-0-1). Review of grammar, reading of Greek texts; translation of simple sentences from English into Greek. Prerequisite: GREEK 102 or consent of Department.

**O GREEK 302 Intermediate Greek II**

★3 (fi 6) (either term, 3-0-0). Selections from Greek poetry and prose. Prerequisite: GREEK 301 or consent of Department.

**L GREEK 470 Topics in Greek Historiography**

★3 (fi 6) (either term, 3-0-0).

**L GREEK 475 Topics in Greek Drama**

★3 (fi 6) (either term, 3-0-0).

**L GREEK 477 Topics in Greek Prose**

★3 (fi 6) (either term, 3-0-0).

**L GREEK 481 Topics in Greek Epic**

★3 (fi 6) (either term, 3-0-0).

**GREEK 482 Topics in Greek Poetry**

★3 (fi 6) (either term, 3-0-0).

**GREEK 483 Topics in Greek Literature**

★3 (fi 6) (either term, 3-0-0).

**L GREEK 499 Individual Study in Greek Authors**

★3 (fi 6) (either term, 3-0-0).

**GREEK 500 Fourth-Year Honors Tutorial**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

**Graduate Courses****GREEK 501 Topics in Greek Epic**

★3 (fi 6) (either term, 3-0-0).

**GREEK 505 Topics in Greek Poetry**

★3 (fi 6) (either term, 3-0-0).

**GREEK 507 Topics in Greek Historiography**

★3 (fi 6) (either term, 3-0-0).

**GREEK 509 Topics in Greek Prose**

★3 (fi 6) (either term, 3-0-0).

**GREEK 575 Topics in Greek Drama**

★3 (fi 6) (either term, 3-0-0).

**GREEK 579 Topics in Koine Greek**

★3 (fi 6) (either term, 3-0-0). Readings and studies in the New Testament and the Church Fathers and other Koine writings.

**GREEK 599 Supervised Reading**

★3 (fi 6) (either term, 3-0-0).

**GREEK 699 Conference Course**

★3 (fi 6) (either term, 3-0-0).

**231.149 Health Education, HE ED**

Faculty of Physical Education and Recreation

**Note:** See also INT D 410 for a course which is offered by more than one Department or Faculty and which may be taken as an option or as a course in this discipline.

**Undergraduate Courses****O HE ED 110 Introduction to Personal Health and Well-Being**

★3 (fi 6) (either term, 3-0-0). An individual-based analysis of physical fitness and

personal health issues. Emphasis on planning and managing one's own lifestyle for health and well-being within the context of the current health care system. Open to all students.

#### HE ED 220 Introduction to Personal Physical Fitness

★3 (*fi 6*) (either term, 3-0-0). A biological analysis of the contributions of physical activity and fitness to health. Emphasis is on the introduction of the components of physical fitness, and the application of these concepts for determination of physical fitness, physical training, and health outcomes. Prerequisite: HE ED 110. NOTE: Not open to BPE or BSc(KIN) students.

#### HE ED 221 Behavioural Medicine

★3 (*fi 6*) (either term, 3-0-0). Focuses on the role of physical activity in the secondary and tertiary prevention of disease, as well as in recovery and rehabilitation following disease treatments, and in the on-going management of chronic disease and illness. Specific psychological and health outcomes of physical activity that are associated with particular disease states and along various illness/wellness trajectories will be examined. Prerequisites: HE ED 110, PEDS 101 and 103 (formerly PEDS 102).

#### HE ED 311 Assessment of Fitness and Health

★3 (*fi 6*) (either term, 3-0-2). Students will gain knowledge in fitness and lifestyle appraisal. Emphasis will be given to validity and reliability of fitness tests and factors involved in the assessment of health and lifestyle. Prerequisites: PEDS 200 and 309.

#### HE ED 320 Social Dimensions of Health Promotion

★3 (*fi 6*) (either term, 3-0-0). An examination of social policies and systems as they affect health and well-being. A macro level approach to understanding health and health promotion in communities and the population at large. Specific attention will be paid to worksite, municipal, provincial and federal programs and policies. Prerequisite: HE ED 110.

#### HE ED 321 Psychological Dimensions of Health Promotion

★3 (*fi 6*) (either term, 3-0-0). An individual-based analysis of health-related behavior and behavior change. Emphasis will be placed upon social psychological approaches to understanding and changing such health-related behaviors as physical activity involvement, dietary practices, smoking, alcohol and drug abuse within a social context. Prerequisite: HE ED 110.

#### HE ED 497 Selected Topics in Health Education

★3 (*fi 6*) (either term, variable). Topics of current interest in the area of Health Education. Note: Topics will vary from Term to Term. Prerequisite: Consent of Faculty.

#### HE ED 499 Directed Studies

★3 (*fi 6*) (either term, variable). A course designed to meet the needs of individual students. Prerequisite: Consent of Faculty.

## 231.150 Health Promotion Studies, HPS

Centre for Health Promotion Studies  
School of Public Health

### Graduate Courses

#### HPS 502 Conducting Research in Health Promotion

★6 (*fi 12*) (two term, 0-3s-0). A critical review of research methods and intervention strategies in health promotion. A broad range of research, review, and evaluation strategies will be presented including both quantitative and qualitative approaches. Emphasis is on developing a critical understanding of the application of different research strategies to answer specific health promotion questions. Students will be expected to develop and present their thesis proposal or significant research project within this course. Prerequisite or corequisite: HPS 501 or consent of instructor.

#### HPS 503 Introduction to Health Promotion Research

★3 (*fi 6*) (either term, 3-0-0). Foundations of basic and applied research in health promotion. Consideration is given to a broad range of research strategies including qualitative and quantitative methods. Emphasis is on a critical understanding of why, when, and how to apply different research strategies to answer specific health promotion questions. Pre- or corequisite: HPS 501. Students with insufficient background in undergraduate statistics will be required to complete a qualifying course in this area.

#### HPS 504 Health Promotion Planning and Evaluation

★3 (*fi 6*) (either term, 0-3s-0). This course is designed to provide students with knowledge of the basic concepts, principles, facts and theories which relate to health program planning and program evaluation. Emphasis is on understanding the interface between and among planning principles, evaluation processes and organizational structures. The course also stresses the importance of analytical and communication skills as they apply to these processes. Prerequisites: HPS 501 and 503. Not to be taken by students with credit in INT D 504. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### HPS 505 Strategies in Health Promotion Practice

★3 (*fi 11*) (either term, 0-3s-0). An analysis of the principles of intervention at individual, community, organization and policy development levels. An overview of the strategies used in the practice of health promotion/evaluation and their application in a variety of health promotion settings (e.g., schools, the workplace, community and health centres). Prerequisite: HPS 501.

#### HPS 506 Special Seminars

★3-9 (*variable*) (either term, variable). Prerequisite: consent of Department. Content varies from year to year. Topics are announced prior to registration period. The student's transcript will carry a title descriptive of the content. May be repeated. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### HPS 508 Psychosocial Perspectives on Health

★3 (*fi 11*) (either term, 0-3s-0). A critical, interdisciplinary review of psychosocial health. Theoretical and methodological implications from a variety of disciplinary perspectives are considered. Prerequisite: HPS 501 or consent of instructor.

#### HPS 509 Independent Studies/Research

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: Departmental approval of plan of study. May be repeated. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### HPS 510 Health Promotion with Communities

★3 (*fi 6*) (either term, 0-3s-0). In this course, learners focus on people taking collective action to influence change. Comprehensive strategies for promoting health are examined and analyzed by example, framed by "empowerment" education, creating supportive environments, strengthening community action and advocating for healthy policies. Learners explore questions and challenges in applying health promotion principles, concepts and theories to practice at the community level. The value of democratic approaches to decision-making is an underlying premise for this course. Note: Pre- or corequisite: HPS 501. Credit will be granted for only one of HPS 510 or NURS 531. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### HPS 512 Health Promotion Practicum

★3-6 (*variable*) (variable, unassigned). This course provides an opportunity for the student to work as part of an interdisciplinary team on a particular component of a health promotion project in the community. Normally, students will possess an academic background enabling them to assume responsibilities for planning and implementing interdisciplinary health promotion activities. Postgraduate Diploma prerequisites: HPS 501, 510 and an approved program planning/evaluation course. MSc Candidates prerequisites: HPS 501, 503, 510, and an approved program planning/evaluation course. Note: ★3 required for Postgraduate Diploma; ★6 required for MSc (thesis) and MPH Health Promotion. Not to be taken by students with credit in HPS 513. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### HPS 513 Practicum and Capping Exercise

★9 (*fi 18*) (variable, variable). Designed to provide students with a full-time, four-month experience in the community as part of an interdisciplinary team. The capping exercise portion will require students to complete a project where they demonstrate their ability to integrate health promotion concepts, principles and theories, and apply their critical thinking skills. A conference style presentation and discussion of that project is required. Normally students will be expected to complete all their course requirements prior to enrolling in HPS 513. Open to students in the MPH in health promotion only. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### HPS 602 Theory and Practice of Health Promotion Interventions

★3 (*fi 6*) (either term, 0-3s-0). A critical examination of intervention strategies, implementation, and research evidence in health promotion practice. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### HPS 603 Qualitative and Community-Based Approaches in Health Research

★3 (*fi 6*) (either term, 0-3s-0). Theoretical understanding of qualitative and community-based research designs, including phenomenology, grounded theory, ethnography, biography and case study. Methods of data collection such as interviews, focus groups and participant observation. Strategies for data analysis and dissemination. Pre or corequisite: HPS 503 or consent of instructor. Note: Credit may not be obtained for both HECOL 603 and HPS 603. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### HPS 606 Current Topics in Health Promotion

★3 (*fi 6*) (either term, variable). Discussion and presentations based on current topics to provide senior master's candidates and doctoral students with advanced preparation in the social, cultural, and behavioural influences on the health of



populations and individuals. Prerequisite: consent of Department. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **HPS 608 Psychosocial Perspectives on Health**

★3 (fi 11) (either term, 0-3s-0). A critical, interdisciplinary review of psychosocial health. Theoretical and methodological implications from a variety of disciplinary perspectives are considered. Prerequisite: HPS 501 or consent of instructor.

#### **HPS 618 Diversity and Health in Families and Communities**

★3 (fi 6) (variable, unassigned). Theoretical approaches and practical issues regarding the provision of health care in Canada with a focus on aboriginal, refugee and immigrant families. Human ecological models, health promotion, and ethical issues will be examined within a framework of cultural diversity. Pre and corequisite: HPS 501 or consent of instructor. Note: Credit may not be obtained for both HECOL 618 and HPS 618. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **HPS 900 Capping Exercise**

★3 (fi 6) (variable, unassigned). Designed to evaluate students' ability to seek out, appraise, and integrate information in the study of health promotion. Development of a written proposal for program funding or a health promotion strategy. Conference style presentation and discussion. Normally students will be expected to complete all their course requirements prior to enrolling in HPS 900. Open to students in the MSc (course-based) only. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

## 231.151 Hindi, HINDI

Department of Modern Languages and Cultural Studies  
Faculty of Arts

### Undergraduate Courses

#### **HINDI 111 Beginners' Hindi I**

★3 (fi 6) (either term, 5-0-0). Introduction to Hindi language and culture. Note: not to be taken by students with native or near native proficiency or any previous instruction in Hindi.

#### **HINDI 112 Beginners' Hindi II**

★3 (fi 6) (either term, 5-0-0). Continuation of HINDI 111. Prerequisite: HINDI 111 or consent of the Department. Note: not to be taken by students with native or near native proficiency. Students who have not taken HINDI 111 but have some background in Hindi will be tested the first day of class for eligibility.

#### **HINDI 211 Intermediate Hindi I**

★3 (fi 6) (either term, 4-0-0). Intended to consolidate a basic understanding of Hindi language and culture by building upon basic language skills acquired in HINDI 111/112. Prerequisite: HINDI 112 or consent of Department.

#### **HINDI 212 Intermediate Hindi II**

★3 (fi 6) (either term, 4-0-0). Continuation of HINDI 211. Prerequisite: HINDI 211 or consent of the Department.

## 231.152 Histoire, HISTE

Faculté Saint-Jean

### Cours de 1er cycle

#### **HISTE 120 Histoire du monde depuis 1500**

★6 (fi 12) (aux deux semestres, 3-0-0). Ce cours aborde, dans une perspective globale et comparative, les principaux développements économiques, politiques et socioculturels qui ont marqué l'histoire du monde, de l'avènement des temps modernes à nos jours. Il vise en particulier à expliquer les échanges et liens qui se sont tissés entre les peuples et les cultures suite aux conquêtes, au commerce et aux migrations.

#### **HISTE 260 Introduction à l'étude de l'histoire du Canada de 1713 à 1867**

★3 (fi 6) (premier semestre, 3-0-0). Ce cours est conçu pour servir de base aux cours de niveau supérieur en histoire canadienne, l'accent étant mis sur le Canada d'expression anglaise, ses relations aux autres groupes (Français, Autochtones et les groupes de la diaspora multiculturelle), la situation des femmes au Canada, l'émigration et l'immigration.

#### **HISTE 261 Introduction à l'étude de l'histoire du Canada de 1867 à nos jours**

★3 (fi 6) (deuxième semestre, 3-0-0). Ce cours est conçu pour servir de base aux cours de niveau supérieur en histoire canadienne et constitue la suite de HISTE 260. Préalable: HISTE 260.

#### **HISTE 303 Construction et identité européennes**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Ce cours étudie l'émergence et l'évolution de l'idée d'Europe, analyse le processus d'unification européenne (de 1945 à nos jours) dans une perspective avant tout historique et, enfin, propose une réflexion critique sur l'identité européenne. Préalable(s) : HISTE 120.

#### **HISTE 311 Histoire de l'Afrique francophone**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude de l'Afrique francophone de la décolonisation à nos jours : le poids de son passé colonial, ses défis politiques, économiques et sociaux, sa place au sein de la francophonie internationale. Préalable(s) : HISTE 120.

#### **HISTE 350 Histoire des États-Unis d'Amérique**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Ce cours est consacré à l'étude de l'histoire des États-Unis, de l'arrivée des premiers colons européens à nos jours. Les dimensions politiques, économiques, sociales et culturelles de l'histoire américaine sont explorées à partir de l'analyse d'une variété de documents historiques et de travaux d'historiens américains. Préalable : HISTE 120.

#### **HISTE 476 Thèmes d'histoire de la francophonie dans l'Ouest canadien**

★3 (fi 6) (l'un ou l'autre semestre, 0-3s-0). Utilisation des techniques avancées de la recherche documentaire pour étudier l'histoire des francophones dans l'Ouest canadien et plus particulièrement en Alberta. Insistance sur les sources premières des archives et des musées. Préalable : HISTE 260 ou 261, ou l'approbation du Vice-doyen aux affaires académiques.

## 231.153 History, HIST

Department of History and Classics  
Faculty of Arts

The courses listed below represent an extensive reorganization and modification of the Department's offerings. Because of changes in course numbers and/or content, students should compare their new course selections with courses previously taken, so as to avoid duplication or overlap. For Ancient History, see Classics listing.

#### Notes

- (1) See also INT D 125, 325, 425, 475 and STS 200, for courses which are offered by more than one Department or Faculty and which may be taken as options or as a course in this discipline.
- (2) 400-level courses are normally conducted as seminars; all are variable content courses and the precise topics covered in any given course may vary from year to year. Some account, therefore, may be taken of the particular interests of students within the framework of the course. Normally, students who enroll in 400-level courses are expected to have at least ★12 in History, including ★6 at the 200 or 300 level (HIST 190 may be substituted for ★3), with an average of at least 2.3. If they do not, they must obtain written permission from the instructor prior to their registration.
- (3) HIST 110, 111 and 112 are designed to provide a foundation for senior and advanced history courses, and also background for studies in related humanities and social sciences.

### Undergraduate Courses

#### **HIST 110 The Pre-Modern World**

★3 (fi 6) (either term, 3-0-0). World history from the end of the 6th century to the 15th century.

#### **HIST 111 The Early Modern World**

★3 (fi 6) (either term, 3-0-0). World history from the 15th century through the 18th century.

#### **HIST 112 The Modern World**

★3 (fi 6) (either term, 3-0-0). The world since the beginning of the 19th century. Not open to students with credit in HIST 120.

#### **HIST 114 The History of the World in the Last 10 Years**

★3 (fi 6) (either term, 3-0-0). Global historical developments over the last 10 years with emphasis on the interaction of states and peoples.

#### **HIST 115 Technology and History**

★3 (fi 6) (either term, 3-0-0). The role of technology in historical developments around the world.

#### **HIST 116 The Emergence of the Atlantic World**

★3 (fi 6) (either term, 3-0-0). The history and legacies of the transatlantic slave trade that linked Europe, Africa, and the Americas, emphasizing economic, political, social and cultural ramifications.

#### **HIST 190 Research Skills and Tools**

★3 (fi 6) (either term, 3-0-0). Designed for prospective history students. 30% of the class will be devoted to developing reading and writing skills. Includes an introduction to the basic concepts of historical inquiry.

**L HIST 206 Introduction to the History of Women in Europe**

★3 (fi 6) (either term, 3-0-0). Introduction to the study of women's history. Examines the position of women in Western societies from the Middle Ages to the 20th century.

**O HIST 207 Pre-Modern Europe I**

★3 (fi 6) (either term, 3-0-0). A survey of Europe from the fourth to the thirteenth century.

**L HIST 210 Europe in the 19th and 20th Centuries**

★3 (fi 6) (either term, 3-0-0).

**HIST 212 Pre-Modern Europe II**

★3 (fi 6) (either term, 3-0-0). A survey of western and central European history from approximately 1200 to 1800.

**L HIST 228 The Early History of the British Peoples**

★3 (fi 6) (either term, 3-0-0). Survey of the development of and relations among the societies and cultures of the British Isles from early times to 1688.

**O HIST 229 Britain and Its Peoples in the Modern Era**

★3 (fi 6) (either term, 3-0-0). Survey of the major themes and issues in the formation of modern Britain from 1688 to the present.

**O HIST 231 Scotland from Early Times to the Present Day**

★3 (fi 6) (either term, 3-0-0). Survey of the history of Scotland from the Reformation to the present.

**O HIST 232 Ireland from Early Times to the Present Day**

★3 (fi 6) (either term, 3-0-0). Survey of the history of Ireland from St Patrick to the present.

**O HIST 241 Colonial Latin America**

★3 (fi 6) (either term, 3-0-0). Survey of Latin American history to 1810.

**O HIST 242 Modern Latin America**

★3 (fi 6) (either term, 3-0-0). Survey of Latin American history since 1810.

**HIST 243 History of the Early Muslim World: from Mecca to Spain and Java**

★3 (fi 6) (either term, 3-0-0). Provides broad historical overview of emergence of Islam in seventh century and its expansion to non-Arab societies in Asia, Africa, and Europe by fifteenth century. Among issues discussed will be political history and worldwide social, cultural and economic impact of this expansion.

**O HIST 246 Africa from Medieval to Modern Times**

★3 (fi 6) (either term, 3-0-0). African history to the 19th century.

**O HIST 247 Africa: From Colonialism to Self-Rule**

★3 (fi 6) (either term, 3-0-0). African history since the 19th century.

**O HIST 249 History of the Middle East**

★3 (fi 6) (either term, 3-0-0). Survey of the Middle East, since the emergence of Islam.

**O HIST 250 American History to 1865**

★3 (fi 6) (either term, 3-0-0). Survey of United States history from colonial times to the Civil War.

**O HIST 251 American History Since 1865**

★3 (fi 6) (either term, 3-0-0). Survey of United States history from the Civil War to the present.

**O HIST 260 Pre-Confederation Canada**

★3 (fi 6) (either term, 3-0-0).

**O HIST 261 Post-Confederation Canada**

★3 (fi 6) (either term, 3-0-0).

**HIST 270 The History of Science, Technology and Medicine: Sources in the History of Science**

★3 (fi 6) (either term, 0-3s-0). The history of science through an analysis of various primary sources. Registration priority will be given to students in Honors, Majors or Minors in History.

**HIST 272 Religion in History**

★3 (fi 6) (either term, 0-3s-0). A study of a religious tradition(s), its teachings and rituals, along with its function in a specific historical setting, including its role in conditioning and reflecting a particular society and culture. Registration priority will be given to students in Honors, Majors or Minors in History.

**L HIST 273 Cultural Studies in History**

★3 (fi 6) (either term, 0-3s-0). Introduction to the study of culture as a concept and as a historical factor, and to cultural studies as a discipline with particular historical and theoretical roots. Registration priority will be given to students in Honors, Majors or Minors in History.

**O HIST 280 East Asia to 1500**

★3 (fi 6) (either term, 3-0-0). Survey of history of East Asia (China, Korea, Japan, Vietnam) to 1500.

**O HIST 281 East Asia from 1500**

★3 (fi 6) (either term, 3-0-0). Survey of the history of East Asia (China, Korea, Japan, Vietnam) from 1500 to the present.

**O HIST 285 China and the West**

★3 (fi 6) (either term, 3-0-0). A survey of Chinese-Western cultural interactions from the time of Marco Polo to the present.

**L HIST 287 The Chinese in Canada and Canadians in China**

★3 (fi 6) (either term, 3-0-0). The history of the Chinese in Canada since the 1850s, and Canada's cultural and social relations with China, Hong Kong and Taiwan, through historical and literary sources, media and film.

**HIST 290 Introduction to History as a Discipline**

★3 (fi 6) (either term, 2-1s-0). Introduction to the basic concepts of historical inquiry and techniques of research and writing in History. Recommended for History majors. Prerequisite: A previous course in History and/or consent of Department.

**L HIST 294 An Introduction to the History of Sciences, Technology, and Medicine**

★3 (fi 6) (either term, 3-0-0). Broad survey of topics in the history of science, technology, and medicine.

**L HIST 295 20th-Century Warfare**

★3 (fi 6) (either term, 3-0-0). In-depth look at some of the conflicts of the 20th century, the course examines wars and revolutions including the two world wars, the Korean and Vietnam wars, African guerrilla wars, and the Gulf War. Analyze the causes and consequences of war and the evolution of weaponry. To be offered in alternate years.

**L HIST 296 World War Two**

★3 (fi 6) (either term, 3-0-0). Emphasis on social and political aspects.

**L HIST 297 The History of Christianity**

★3 (fi 6) (either term, 3-0-0). Lecture and discussion course about the development of Christian traditions in the world.

**O HIST 300 Topics in European History**

★3 (fi 6) (either term, 3-0-0).

**O HIST 304 Reform, Revolt, and Revolution: Europe 1300-1800**

★3 (fi 6) (either term, 3-0-0). Examines and compare ecclesiastical and political reform movements, agricultural and urban revolts, peasant uprisings, the Reformation, Dutch Revolt, and English, American, and French 'Revolutions.'

**O HIST 305 France: Old Regime and Revolution (1600-1815)**

★3 (fi 6) (either term, 3-0-0).

**O HIST 306 Contemporary France (Since 1914)**

★3 (fi 6) (either term, 3-0-0).

**HIST 307 The History of the Eastern Orthodox Church**

★3 (fi 6) (either term, 3-0-0).

**O HIST 309 The History of Paris**

★3 (fi 6) (either term, 3-0-0). Introduction to the history of Paris from late antiquity to the present day, drawing on film, music, art, philosophy, geography, architecture, and literature.

**O HIST 310 A History of the Habsburg Monarchy, 1526-1918**

★3 (fi 6) (either term, 3-0-0). The multinational empire of the Habsburgs from the unification of Austria, Bohemia and Hungary to the destruction of the empire in World War I. Note: Not open to students with credit in HIST 307.

**O HIST 312 Foundations of East European History**

★3 (fi 6) (either term, 3-0-0). The ethnic, religious, social, and political factors which shaped the development of the peoples of Eastern Europe from the Middle Ages through the Age of Enlightenment. Intended as background to the later histories of the Balkans, 'Central Europe', and Ukraine.

**O HIST 313 Medieval and Early Imperial Russia**

★3 (fi 6) (either term, 3-0-0). Russia from Kievan Rus' through Catherine the Great's reign, 900s to 1800. Note: Not open to students with credit in HIST 318.

**O HIST 316 The Ukrainian National Idea**

★3 (fi 6) (either term, 3-0-0). The Ukrainian national revival in the Russian empire and Habsburg monarchy; collapse of the empires and struggles to establish Ukrainian statehood.

**O HIST 317 Ukraine Since 1920**

★3 (fi 6) (either term, 3-0-0). The Soviet Ukrainian Republic, Ukrainian lands in Central Europe during the interwar period, independent Ukraine.

**HIST 320 Russia from Reform to Revolution, 1800-1917**

★3 (fi 6) (either term, 3-0-0). Reaction, reform, and revolution, from Paul I to Nicholas II. Note: Not open to students with credit in HIST 318.

**O HIST 322 Russia in the 20th Century**

★3 (fi 6) (either term, 3-0-0). An historical survey of domestic and foreign policy, from Nicholas II to Yeltsin. Not open to students who have successfully completed HIST 320.

**O HIST 323 The Middle East in the Making: 1300-1920**

★3 (fi 6) (either term, 3-0-0). The rise and demise of the Ottoman Empire. An overview of the religious, cultural and political making of current-day North Africa, Near and Middle East, and Eastern Mediterranean. No Prerequisites: although HIST 120/111/112 would be helpful.

**O HIST 324 Historical Writing: The Israelite Tradition**

★3 (fi 6) (either term, 3-0-0). A study of the Deuteronomistic History (the books from Joshua to 2 Kings in the Hebrew Bible) and of the Chronistic History (the books of 1-2 Chronicles in the Hebrew Bible) in their ancient near eastern context.

**O HIST 325 History of Domestic Technology**

★3 (fi 6) (either term, 3-0-0).

**O HIST 326 Topics in History at the Movies**

★3 (fi 6) (either term, 3-0-0). This course will provide students with the historical tools to analyze history as it is presented in movies. The topics will vary according to the instructor(s).

**O HIST 327 History of Modern Ireland**

★3 (fi 6) (either term, 3-0-0). Encompasses events in Ireland from the Act of Union in 1800 to the present day. As a history with an abundant mixture of tragedy and triumph, the course will investigate the unfolding of Ireland's story over the modern period in its political, social, economic and cultural dimensions.

**O HIST 328 Everyday Life and Popular Culture in Early Britain**

★3 (fi 6) (either term, 3-0-0). How British peoples have lived, worked and understood their daily lives from ancient times until the Industrial Revolution.

**L HIST 329 The Forming of England**

★3 (fi 6) (either term, 3-0-0). Survey of the emergence of the English state and culture from the collapse of Roman Britain to 1189.

**HIST 330 The Emergence of the European State System, 1648-1740**

★3 (fi 6) (either term, 3-0-0). The diplomatic history of Europe from the Peace of Westphalia to 1740.

**O HIST 331 England in the Age of Robin Hood**

★3 (fi 6) (either term, 3-0-0). Survey of the history of England during the later Middle Ages (1189-1485).

**O HIST 332 The Rise and Fall of the Tudor Regime**

★3 (fi 6) (either term, 3-0-0). From medieval kingdoms to the dawn of a single Britain, the turbulent era of Protestantism, revolutions and centralizing monarchs (1485-1660).

**O HIST 333 The Transformation of the European State System, 1740-1848**

★3 (fi 6) (either term, 3-0-0). Diplomatic history of Europe from 1740 to 1848.

**HIST 334 Crisis and Collapse of the European State System, 1848-1923**

★3 (fi 6) (either term, 3-0-0). Diplomatic history of Europe from the Revolutions of 1848 to the aftermath of World War I.

**O HIST 336 The Transformation of British Society, 1660-1851**

★3 (fi 6) (either term, 3-0-0). Political, economic and social changes that contributed to the making of modern Britain.

**HIST 337 France: From the Restoration to the First World War (1815-1914)**

★3 (fi 6) (either term, 3-0-0).

**O HIST 339 The Second British Empire and the Commonwealth Experience in the 19th and 20th Century**

★3 (fi 6) (either term, 3-0-0).

**O HIST 340 Topics in British History**

★3 (fi 6) (either term, 3-0-0).

**O HIST 342 Political and Social Revolution in Latin America**

★3 (fi 6) (either term, 3-0-0). Twentieth-century Chile, Guatemala, and Mexico. No prerequisite but HIST 242 is recommended.

**O HIST 343 Mexico**

★3 (fi 6) (either term, 3-0-0). Mexican history with emphasis on the modern period. Prerequisites: HIST 241 and 242 or consent of Department.

**O HIST 347 Topics in African History**

★3 (fi 6) (either term, 3-0-0).

**O HIST 348 History of the Contemporary Middle East**

★3 (fi 6) (either term, 3-0-0). Social, cultural, and political history of the Middle East since the nineteenth century. Course covers dissolution of empires, imperialism, decolonization, and the creation of nation-states.

**O HIST 349 Topics in Middle East History**

★3 (fi 6) (either term, 3-0-0).

**O HIST 350 Comparative American and Canadian History**

★3 (fi 6) (either term, 3-0-0).

**O HIST 351 History of Women in the United States**

★3 (fi 6) (either term, 3-0-0). A multicultural and multiracial history of women from the colonial period to the present.

**O HIST 352 History of American Minorities**

★3 (fi 6) (either term, 3-0-0). The experiences of racial and ethnic minorities and the meanings of race and ethnicity in American history including such groups as African Americans and Asian Americans.

**O HIST 353 History of American Medicine**

★3 (fi 6) (either term, 3-0-0). The social history of American health care and health practitioners. How sickness, health, and healing have changed over the course of American history.

**O HIST 354 American Economic History**

★3 (fi 6) (either term, 3-0-0). American economic problems and policies in their historical setting.

**O HIST 355 Southern Africa in the Nineteenth Century**

★3 (fi 6) (either term, 3-0-0).

**O HIST 356 Southern Africa Since 1885**

★3 (fi 6) (either term, 3-0-0).

**L HIST 358 History of the Canadian and Circumpolar Arctic**

★3 (fi 6) (either term, 3-0-0). The Canadian Arctic in Circumpolar (including Scandinavian and Russian/Soviet) perspective over the course of the period of contact by Europeans with Native peoples (sixteenth century to present).

**HIST 359 Canadian Environmental History**

★3 (fi 6) (either term, 3-0-0). Brings the natural environment onto a shared stage with social, economic, political and cultural history in Canada from the last ice age to the present.

**O HIST 360 Topics in Canadian History**

★3 (fi 6) (either term, 3-0-0).

**L HIST 361 Military History of Canada**

★3 (fi 6) (either term, 3-0-0). Canadian armed conflicts from the Iroquois Wars to the Gulf War; emphasis will be on the evolution of weapons, tactics and military organization.

**O HIST 362 History of Alberta**

★3 (fi 6) (either term, 3-0-0). Economic, social, and political realities that underlie the many images of Alberta.

**O HIST 363 History of Canadian External Relations**

★3 (fi 6) (either term, 3-0-0).

**O HIST 365 The Canadian West to 1885**

★3 (fi 6) (first term, 3-0-0). Native diplomacy and warfare, the development of fur trade societies, and European colonization to the suppression of the North-West Rebellion.

**O HIST 366 The Canadian West Since 1885**

★3 (fi 6) (either term, 3-0-0). Economic, social, and political aspects of regional alienation, identity, and protest.

**O HIST 367 History of Ukrainians in Canada**

★3 (fi 6) (either term, 3-0-0). Ukrainian-Canadian life within the context of Canadian immigration policies and nation building and the experiences of other ethnic groups.

**O HIST 368 History of the Native Peoples of Canada to 1867**

★3 (fi 6) (either term, 3-0-0). Native cultures and societies, Native-newcomer relations, colonial Indian policy, and Native resistance to colonialism.

**O HIST 369 History of the Native Peoples of Canada Since 1867**

★3 (fi 6) (either term, 3-0-0). Federal Indian policy, treaties, reserve life, Native political resurgence, and legal and constitutional developments.

**O HIST 371 History of Women in Canadian Society**

★3 (fi 6) (either term, 3-0-0). The biological, social, economic, and political forces shaping women's lives from the colonization of New France to the present.

**HIST 373 Peasants, Slaves and Workers**

★3 (fi 6) (either term, 3-0-0). The history of work regimes and regulation from feudalism to the present.

**O HIST 374 French Canada to Confederation**

★3 (fi 6) (either term, 3-0-0). The emergence of a distinctive Canadian society under the French Crown and its subsequent development within British North America.

**O HIST 375 French Canada Since Confederation**

★3 (fi 6) (either term, 3-0-0). The survival of the French Community in Canada within the context of Quebec nationalism, ethnic conflict, and constitutional reform.

**O HIST 376 Canada 1900 to 1945**

★3 (fi 6) (either term, 3-0-0). Booms and depressions, world wars, social strife, and political experiments mark one of the most turbulent and critical eras in the nation's history.

**O HIST 377 Canada Since 1945**

★3 (fi 6) (either term, 3-0-0). Economic, political, social and cultural developments in the postwar era.



**O HIST 381 The Land of the Rising Sun: Japan to 1868**

★3 (fi 6) (either term, 3-0-0).

**O HIST 382 Search for a Destiny: Japan's Modern Era, 1868-Present**

★3 (fi 6) (either term, 3-0-0). Social, political, economic and technological development; motivations, policies, obstacles and achievements are emphasized.

**O HIST 383 The Civilization and Culture of Early China**

★3 (fi 6) (either term, 3-0-0). This course focuses on the formative periods of Chinese civilization from prehistory to circa 600.

**O HIST 384 History of Chinese Philosophy**

★3 (fi 6) (either term, 3-0-0). Historical development of the major philosophical traditions in pre-modern China.

**O HIST 385 Modern China**

★3 (fi 6) (either term, 3-0-0). The history of China from the Opium Wars to the present.

**HIST 389 Topics in Historical Methodology and Theory**

★3 (fi 6) (either term, 0-3s-0). Selected key issues regarding historical method and theory. Fulfills ★3 of the History prerequisite for admission to 400-level seminars. Prerequisite: HIST 190 or 290. Cannot be taken concurrently with HIST 500 or by students with credit in HIST 500. Registration priority will be given to students in Honors, Majors or Minors in History.

**O HIST 390 Imperial China from circa 600 to 1911**

★3 (fi 6) (either term, 3-0-0). The institutional and social history of imperial China from the Tang to the Manchu Ch'ing dynasties.

**HIST 391 History of Technology**

★3 (fi 6) (either term, 3-0-0). History of technology from the building of the pyramids to the International Space Station.

**O HIST 392 Ancient India- Diversity in History**

★3 (fi 6) (either term, 3-0-0). Taking the case of ancient India, this course highlights how diversity can be explained in a multicultural society and how it defines the character of civilization on the sub-continent.

**O HIST 393 Economic Change and Cultural Exchange in Early India 200 BCE-300 CE**

★3 (fi 6) (either term, 3-0-0). This course shall identify the phases of economic change in early India and concomitantly discuss cultural exchange in the context of contact with various foreign countries that resulted in the emergence of a cosmopolitan socio-cultural milieu during this period.

**L HIST 394 History of Astronomy and Cosmology from Stonehenge to the Space Age**

★3 (fi 6) (either term, 3-0-0). An examination of the major themes in the history of astronomy and cosmology from the ancient world to the present day.

**O HIST 396 History of Medicine I**

★3 (fi 6) (either term, 3-0-0). Introduction to European medicine from Hippocrates to William Harvey and his immediate successors.

**L HIST 397 History of Science I**

★3 (fi 6) (either term, 3-0-0). Introduction to the intellectual, institutional, and ideological development of science, from Aristotle to the 'Scientific Revolution'.

**O HIST 398 History of Science II**

★3 (fi 6) (either term, 3-0-0). Introduction to the intellectual, institutional, and ideological development of science, from Newtonianism to the present day.

**O HIST 399 History of Medicine II**

★3 (fi 6) (either term, 3-0-0). Introduction to the changing content, practice, and organization of European medicine since 1700.

**HIST 401 Topics in the History of the Habsburg Monarchy**

★3 (fi 6) (either term, 0-3s-0).

**HIST 402 Women in Modern European History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 403 Topics in Medieval European History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 405 Fashion and Material Culture c. 1600-1900**

★3 (fi 6) (either term, 0-3s-0). The evolution and practice of fashion as a social, economic, political and cultural phenomenon from a cross-cultural perspective.

**HIST 409 The Cultural and Intellectual History of the Enlightenment**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: A previous course in European History or consent of Department.

**HIST 410 The French Revolution**

★3 (fi 6) (either term, 0-3s-0).

**HIST 411 Topics in the History of France**

★3 (fi 6) (either term, 0-3s-0).

**HIST 414 Topics in the History of Modern Germany**

★3 (fi 6) (either term, 0-3s-0).

**HIST 415 Topics in Ukrainian History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 416 Topics in Eastern European History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 419 Topics in Soviet History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 420 Topics in the History of Early Modern Europe**

★3 (fi 6) (either term, 0-3s-0). Thematic studies in European cultural, religious, and social history emphasizing popular culture and religion.

**HIST 421 Topics in the History of Europe**

★3 (fi 6) (either term, 0-3s-0).

**HIST 424 Constructions of the Past and the Development of Social Memory in Ancient Israel**

★3 (fi 6) (either term, 0-3s-0). The role of social memory in Ancient Israel, as reflected in the texts that eventually formed the Bible.

**HIST 425 Topics in History of Ancient Israel**

★3 (fi 6) (either term, 0-3s-0).

**HIST 427 Topics in Indian History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 428 Topics in the History of Christianity**

★3 (fi 6) (either term, 0-3s-0).

**HIST 429 Topics in British History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 430 Topics in the History of Anglo-Saxon England**

★3 (fi 6) (either term, 0-3s-0).

**HIST 431 Topics in the History of England from the Conquest (1066) to 1500**

★3 (fi 6) (either term, 0-3s-0).

**HIST 432 Topics in 16th-Century British History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 437 Topics in British Social History Since 1714**

★3 (fi 6) (either term, 0-3s-0).

**HIST 441 Topics in Latin American History to 1850**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: HIST 241/242 or consent of Department.

**HIST 442 Topics in Latin American History Since 1850**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: HIST 241/242 or consent of Department.

**HIST 443 Nationalisms and Nation-States in the Middle East**

★3 (fi 6) (either term, 0-3s-0). The historical roots of the emergence and institutionalization of nationalisms in the Middle East. Various theoretical approaches introduced with specific references to historical developments in the Middle East since the nineteenth century.

**HIST 446 Themes and Issues in African History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 448 New Approaches in Africa**

★3 (fi 6) (either term, 0-3s-0).

**HIST 449 Advanced Topics in Middle East History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 450 Topics in American History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 452 Topics in 19th-Century America**

★3 (fi 6) (either term, 0-3s-0).

**HIST 453 Topics in 20th-Century America**

★3 (fi 6) (either term, 0-3s-0).

**HIST 454 Topics in American Women's History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 459 Topics in American History Since 1945**

★3 (fi 6) (either term, 0-3s-0).

**HIST 460 Topics in Canadian History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 461 Topics in History of Immigrant and Ethnic Women in Canada**

★3 (fi 6) (either term, 0-3s-0).

**HIST 464 Topics in the History of the Canadian West**

★6 (fi 12) (two term, 0-3s-0).

**HIST 467 Topics in Alberta History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 468 Topics in the History of Ethnic Settlement**

★3 (fi 6) (either term, 0-3s-0).

**HIST 470 Topics in Canadian Social History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 474 Topics in the History of French Canada**

★3 (fi 6) (either term, 0-3s-0).

**HIST 478 Topics in the History of the Canadian North**

★3 (fi 6) (either term, 0-3s-0).

**HIST 480 Topics in Japanese History**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: A course in Asian history or consent of Department.

**HIST 481 Topics in Chinese History**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: A course in Asian history or consent of Department.

**HIST 483 Topics in the History of Chinese Thought**

★3 (fi 6) (either term, 0-3s-0). An examination of the major traditions and developments of Chinese thought. How Confucian, Taoist, Legalist and Buddhist concepts shaped the politics, history and culture of traditional China is of particular interest to the course. Prerequisite: A previous course in Asian history or consent of Department.

**HIST 486 Topics in the History of Technology**

★3 (fi 6) (either term, 0-3s-0).

**HIST 488 Topics in the History of Medicine**

★3 (fi 6) (either term, 0-3s-0).

**HIST 489 Conference Seminar**

★1-12 (variable) (variable, variable).

**HIST 490 Topics in British Empire and Commonwealth History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 492 Topics in History and Theory**

★3 (fi 6) (either term, 0-3s-0).

**HIST 493 War and Society in the Modern World**

★3 (fi 6) (either term, 0-3s-0).

**HIST 494 Topics in Comparative History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 496 Topics in the History of Science**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: At least one of HIST 294, 396, 397, 398 or 399 or consent of Department.

**HIST 497 History of Women and Health**

★3 (fi 6) (either term, 0-3s-0). This seminar examines the multi-cultural history of women as health practitioners, patients, and health activists in North America. Not open to students who have successfully completed WST 497.

**HIST 498 Directed Study**

★3 (fi 6) (either term, 0-3s-0).

**HIST 500 Methodology and Historiography for Honors Students**

★6 (fi 12) (two term, 0-3s-0).

**HIST 501 Special Subject, Fourth Year Honors History**

★6 (fi 12) (two term, 0-3s-0). Preparation of the Honors essay, required in the fourth year of the Honors program.

**Graduate Courses****Note:** Previous study in the area is prerequisite for each course.**HIST 601 Philosophy of History and Methodology**

★3 (fi 6) (either term, 0-3s-0).

**HIST 602 Research Methods and Resources in History**

★1 (fi 2) (either term, 0-1s-0).

**HIST 603 History of Historical Writing**

★3 (fi 6) (either term, 0-3s-0).

**HIST 604 The Application of the Social Sciences to History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 605 Topics in the Nature of Historical Controversy**

★3 (fi 6) (either term, 0-3s-0).

**HIST 609 Directed Study**

★3 (fi 6) (either term, 0-3s-0). This is a credit/fail course. Not open to students in the non-thesis program.

**HIST 614 Topics in the History of Later Medieval and Early Modern Europe**

★3 (fi 6) (either term, 0-3s-0). A reading knowledge of at least one of the following languages is required: Latin, German, French, Dutch or Italian.

**HIST 617 Fashion and Material Culture: Politics, Economies, Societies, c. 1600-1900**

★3 (fi 6) (either term, 0-3s-0).

**HIST 626 Topics in the History of France**

★3 (fi 6) (either term, 0-3s-0).

**HIST 627 Topics in Indian History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 628 Topics in the History of Christianity**

★3 (fi 6) (either term, 0-3s-0).

**HIST 630 Problems in Imperial Russian History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 631 Problems in 20th-Century Russian History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 633 Problems in Modern East European History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 640 Rural Society in Medieval England**

★3 (fi 6) (either term, 0-3s-0).

**HIST 641 The Rise of Consumer Society: Comparative Explorations of Culture, Society and Economy, c. 1500-1900**

★3 (fi 6) (either term, 0-3s-0).

**HIST 642 Gender and the Creation of Modern Industrial Society: Britain c. 1600-1900**

★3 (fi 6) (either term, 0-3s-0).

**HIST 643 The Institutional and Legal History of Early-Modern England**

★3 (fi 6) (either term, 0-3s-0).

**HIST 644 Reformation to Revolution: Topics in Intellectual History in Early Modern England**

★3 (fi 6) (either term, 0-3s-0).

**HIST 646 The British Empire and Commonwealth**

★3 (fi 6) (either term, 0-3s-0).

**HIST 649 Topics in Middle East History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 650 Topics in United States Women's History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 653 Topics in U.S. History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 655 Slavery and Anti-Slavery in the United States**

★3 (fi 6) (either term, 0-3s-0).

**HIST 658 Topics in American History Since 1945**

★3 (fi 6) (either term, 0-3s-0).

**HIST 660 Topics in Canadian History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 664 Topics in Western Canadian History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 666 Topics in the History of British North America**

★3 (fi 6) (either term, 0-3s-0).

**HIST 676 Topics in Canadian Social History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 685 Tradition and Modernity in China**

★3 (fi 6) (either term, 0-3s-0).

**HIST 686 Topics in Modern Chinese History**

★3 (fi 6) (either term, 3-0-0).

**HIST 691 Topics in Latin American History to 1850**

★3 (fi 6) (either term, 0-3s-0).

**HIST 692 Topics in Latin American History Since 1850**

★3 (fi 6) (either term, 0-3s-0).

**HIST 693 Topics in Military History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 695 Slavery in Africa**

★3 (fi 6) (either term, 0-3s-0).

**HIST 696 Topics in the History of the Sciences**

★3 (fi 6) (either term, 0-3s-0).

**HIST 697 Topics in the History of Technology**

★3 (fi 6) (either term, 0-3s-0).

**HIST 698 Topics in the History of Medicine**

★3 (fi 6) (either term, 0-3s-0).

**HIST 699 Research Seminar**

★3 (fi 6) (either term, 0-3s-0).

**HIST 800 Conference Course**

★6 (fi 12) (two term, 0-3s-0). Not open to graduate students in the Department of History.

**HIST 850 Advanced Topics in Historical Study**

★3 (fi 6) (either term, 0-3s-0). Not open to graduate or honors students in the Department of History.

**HIST 900 Directed Research Project**

★3 (fi 6) (variable, unassigned).

**231.154 Human Ecology, HECOL**Department of Human Ecology  
Faculty of Agriculture, Life and Environmental Sciences**Undergraduate Courses**

Note: Enrolment in some HECOL course is restricted to students registered in human ecology programs, or to students registered in specified programs that require HECOL courses to meet degree requirements. Course prerequisites are enforced.

**HECOL 100 Introduction to Principles and Practice in Human Ecology**

★3 (fi 6) (either term, 3-0-0). An introductory course that provides a foundation in the body of knowledge that constitutes the field of human ecology. The history, philosophy, theoretical approaches and scope of the field are explored and skills that foster effective professional practice are discussed.

**O HECOL 170 Introduction to Textiles**

★3 (fi 6) (either term, 3-0-0). An introductory exploration of the origin, creation and use of textiles in our world. Chemical and physical properties of fibres and fabrics are introduced and an understanding of how these properties influence various clothing and textile end uses is developed.

**O HECOL 201 Material Culture**

★3 (fi 6) (either term, 3-0-0). The study of a range of objects within selected time periods and environments, and the study of particular perspectives through which objects can be interpreted. Students are encouraged to understand the connection between personal, social, temporal, and cultural contexts and the objects that contribute to these contexts.

**O HECOL 210 Intimate Relationships**

★3 (fi 6) (either term, 3-0-0). A consideration of the sociological, psychological, and personal factors affecting the development, maintenance and dissolution of intimate relationships today.

**O HECOL 211 Human Sexuality**

★3 (fi 6) (either term, 3-0-0). An inquiry into the nature of sexual behavior, its personal and cultural sources, and the personal, familial and societal implications.

**O HECOL 212 Later Life Families**

★3 (fi 6) (either term, 3-0-0). An exploration of the interpersonal, personal and physical needs of families throughout the later stages of the life course. Offered in alternate years.

**O HECOL 241 Fashion Industries**

★3 (fi 6) (either term, 3-0-0). An introduction to the soft goods industry including an overview of the apparel sector, apparel production, channels of distribution, fashion oriented products, global competitive influences, and career opportunities.

**HECOL 250 Design Studies and Practice**

★3 (fi 6) (either term, 3-0-3). Explores the production of artifacts as material culture from a human ecology perspective. Artifact production focuses on the design process including visualization, communication, inspiration/influence and interface. Students are introduced to the production of two- and three-dimensional design through historical and contemporary examples. Students also complete hands-on design projects in the studio.

**HECOL 254 Apparel Design and Construction Fundamentals**

★3 (fi 6) (either term or Spring/Summer, 3-0-3). In this studio course students develop fundamental awareness and skills for the textiles and clothing field including machine operation, design and construction terminology, pattern manipulation and fit, and quality construction techniques. Students construct samples and garments with a focus on professional standards in problem-solving and production. Prerequisites: One of HECOL 150, 170, or DES 135 or DES 138/139. Normally offered in Spring/Summer.

**O HECOL 268 Survey of Historic Dress**

★3 (fi 6) (either term, 3-0-0). Introduction to the historical development of dress with contemporary applications in design, merchandising, arts performance, education and museums. Resources include the Clothing and Textiles Collection.

**HECOL 270 Applications of Textile Science**

★3 (fi 6) (either term, 3-0-3). Advancement of textile concepts introduced in HECOL 170 with an emphasis on textile finishing, colouration, care and maintenance. Techniques for fibre identification and yarn and fabric structural analysis are covered. Prerequisite: HECOL 170.

**HECOL 300 Human Ecological Perspectives on Policy Development and Evaluation**

★3 (fi 6) (either term, 3-0-0). Processes of policy development, implementation and analysis; Canadian policy environments, institutional frameworks and instruments; application to professional practice and to current social and economic issues.

**HECOL 301 Program Planning and Evaluation**

★3 (fi 6) (either term, 3-0-1.5). Theories and processes of program planning, implementation, evaluation and group dynamics from a human ecological perspective. Laboratory classes focus on practicing skills and processes appropriate to professional practice and the student's career interests. Prerequisite: successful completion of ★60.

**HECOL 310 Parent-Child Relationships**

★3 (fi 6) (either term, 3-0-0). An exploration of parent-child relationships, with a concentration from infancy through adolescence. An examination of theoretical and research perspectives of parent-child relationships and the practical application of those perspectives. Prerequisite: (PSYCO 104 and 105) or EDPY 200; PSYCO 104 and 105 are preferred.

**HECOL 313 Family Dynamics**

★3 (fi 6) (either term, 3-0-0). An introduction to family dynamics from the perspective of family theory. Changes in family dynamics across the life course will be examined using theoretical concepts, research, and practical application of concepts. Prerequisite: successful completion of ★60.

**HECOL 315 Interviewing and Counseling**

★3 (fi 6) (either term, 3-0-3). An introduction to interviewing and counseling strategies for working with individuals using a strengths-based, human ecological approach. Prerequisite: successful completion of ★30.

**O HECOL 321 Introduction to Family Finance**

★3 (fi 6) (either term, 3-0-0). An introduction to the principles of money management applied to family income and expenditure. Students learn the basic skills and tools required to identify financial goals, assess current resources, develop and implement a financial plan and evaluate financial progress. Prerequisites: ECON 101; it is recommended that students have completed both ECON 101 and 102.

**O HECOL 322 Family Economic Issues**

★3 (fi 6) (either term, 3-0-0). An examination of current issues affecting the economic well-being of Canadian families and of government policies which address those issues. Issues explored include work and family; the economics of childbearing, education, delayed life transitions, and aging; intrafamily allocation of resources; and money and family relationships. Prerequisites: ECON 101; it is recommended that students have completed both ECON 101 and 102.

**O HECOL 333 Cross-Cultural Textiles**

★3 (fi 6) (either term, 3-0-3). An introduction to the historical and technological development of cross-cultural textiles and survey of common textile-making techniques, designs, and embellishments. Ethnographic textiles are analyzed in the context of socio-cultural, political, economic, environmental, and aesthetic meanings. The course combines lectures, class discussions, videos, hands-on presentations, and examination of artifacts from the Clothing and Textiles Collection. Prerequisite: ★6 from ANTHRO, ART, ART H, DES, HECOL

**HECOL 354 Apparel Design and Product Development I**

★3 (fi 6) (either term, 3-0-3). Principles of design and merchandising applied to apparel design and portfolio development. A creative problem-solving approach to the production of a line of clothing. Prerequisite: HECOL 254 or CTS Fashion Studies modules at the intermediate level or equivalent.

**HECOL 360 Dress and Culture**

★3 (fi 6) (either term, 3-0-0). The complex phenomenon of bodily adornment is explored in relationship to values, attitudes, activities, beliefs, and forms of knowledge. Clothing is considered in terms of how it is expressive of various aspects of culture. Students develop analytical skills to help them understand the role played by clothing in different times, places, and contexts. Prerequisite: HECOL 201.

**HECOL 370 Quality Assurance for Textiles and Apparel**

★3 (fi 6) (either term, 3-0-3). Exploration of quality assurance of textiles and apparel through materials testing. Performance of textiles relative to product standards and specifications. Prerequisite: HECOL 270.

**HECOL 408 Intentional Professional Practice**

★3 (fi 6) (either term, 3-0-0). Preparation for human ecology practicum placement. Effective workplace relationships and issues involved in professional practice are explored within the context of being both a practicum student and a human ecology professional. Self awareness and self-understanding as a professional are key concepts of the course. Taken in the term preceding HECOL 409. Application to Practicum Coordinator required four months prior to start of the course.



Prerequisite: Open to human ecology students only; must have completed ★90, including HECOL 100, prior to application.

#### HECOL 409 Practicum in Human Ecology

★6 (fi 12) (either term, 0-0-16). Supervised field experience. Students are placed in professional settings appropriate to their academic background and career goals. Participation in a weekly online seminar is required. Open to Human Ecology students who have completed ★105. Prerequisite: HECOL 408. Application required (see description of HECOL 408). "Requires payment of additional student instructional support fees." Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### HECOL 412 Family Challenges

★3 (fi 6) (either term, 3-0-0). An in-depth exploration of several family challenges (e.g. divorce, addiction and childhood and adult abuse). An introduction to specific prevention and intervention approaches related to family challenges. Prerequisites: HECOL 313 and 315.

#### HECOL 413 Working With Families

★3 (fi 6) (either term, 3-0-3). Assessment and counseling strategies for working with families using a strengths-based, family-centred approach. Prerequisites: HECOL 313 and 315. Normally offered in Spring/Summer.

#### HECOL 414 Seniors and Their Environments

★3 (fi 6) (either term, 3-0-0). An introduction to the environments in which older people live. The course uses an ecological framework to study the symbolic, physical, interpersonal, community and political environments of Canadian seniors. Prerequisite: successful completion of ★60. Offered in alternate years.

#### HECOL 440 Family Policy Issues

★3 (fi 6) (either term, 3-0-0). Analysis of current policy issues faced by Canadian families and the examination of policies and programs affecting family well-being and relationships. Prerequisite: HECOL 300.

#### HECOL 441 Textiles and Apparel in the Global Economy

★3 (fi 6) (either term, 3-0-0). Production and distribution of textiles and apparel in a global context; issues and policy related to international trade agreements; impact of national and international consumer, labor and environmental standards. Prerequisite: HECOL 300.

#### HECOL 443 Family Law

★3 (fi 6) (either term, 3-0-0). Family law regulates intimate and domestic relationships. Examines from a user's perspective, how statutory and common law affects family relationship issues such as marriage and divorce, child custody and child welfare, adoption, and new reproductive technologies. Prerequisite: HECOL 300.

#### HECOL 454 Apparel Design and Product Development II

★3 (fi 6) (either term or Spring/Summer, 3-0-3). Advanced problems in apparel design and product development. Tailoring methods and specialty fabric techniques are explored. Prerequisite: HECOL 354. Normally offered in Spring/Summer.

#### HECOL 460 Nineteenth and Twentieth Century Dress

★3 (fi 6) (either term, 3-0-3). This course investigates 19th and 20th century garments as artifacts and explores their historical contexts. A combination of lectures and labs are used to introduce students to artifactual research and the handling, storage, examination and documentation of artifacts in the University Clothing and Textiles Collection. Prerequisite: HECOL 268. Normally offered in alternate years

#### HECOL 462 Material Culture in Home and Community

★3 (fi 6) (either term, 2-0-3). Framed within the context of theories in human ecology, this course investigates material culture ranging from individual artifacts to community, including local and global environments. The roles and effects of material culture on individual, familial and community living are explored through literature, artifacts and life-stories. These issues are examined through a combination of seminars and group work culminating in an exhibit. Prerequisite: HECOL 201.

#### HECOL 464 Fashion and Material Culture: Politics, Economies, Societies, c. 1600-1900

★3 (fi 6) (either term, 3-0-0). Examines the evolution and practice of fashion as a social, economic, political and cultural phenomenon from a cross-cultural perspective. Prerequisite: consent of instructor. Normally offered in alternate years.

#### HECOL 465 Material Culture, Identities, and Interpretations

★3 (fi 6) (either term, 3-0-0). Examines the relationship between objects and persons in a range of near environments, and considers how objects may be interpreted through specific social theories. Prerequisite: minimum grade of B+ in HECOL 333 or 360 and HECOL 460 or 462, or consent of instructor. Normally offered in alternate years.

#### HECOL 469 Material Culture in Practice

★3 (fi 6) (either term, 3-0-0). Explores how human ecological and material culture approaches contribute to the analysis of a range of contemporary issues in design practice. Prerequisite: minimum grade of B+ in HECOL 333 or 360 and HECOL 460 or 462, or consent of Instructor. Normally offered in alternate years.

#### HECOL 470 Topics in Advanced Textile and Apparel Science

★3 (fi 6) (either term, variable). Topics offered will vary each year. Prerequisite: HECOL 370.

#### HECOL 473 Clothing and Materials for Sport and Safety

★3 (fi 6) (either term, 3-0-1.5). A human ecological exploration of the selection, use and performance of clothing and materials used for workplace safety protection and sporting/recreational activities. Prerequisite: HECOL 370. Normally offered in alternate years.

#### HECOL 476 Textile Analysis and Care

★3 (fi 6) (either term, 3-0-0). Theory and practice in the analysis of deterioration and damage of modern and historic textiles. Macro and microscopic evidence will be combined with the theories of fibre degradation and textile soiling to identify the causes of material wear, discoloration and failure during normal use, care and storage. Theory related to the cleaning of textiles will include detergency, bleaching, dry-cleaning and the development of customized solutions for specific cleaning problems. Prerequisites: HECOL 270 or consent of instructor. Normally offered in alternate years.

#### HECOL 490 Independent Investigation in Human Ecology

★3 (fi 6) (either term, variable). Independent project or study of a topic in human ecology planned by the student with an instructor. Open to human ecology students only. Prerequisite: successful completion of ★75, application to Department, and consent of Instructor.

#### HECOL 492 Selected Topics in Family Ecology

★3 (fi 6) (either term, variable). Normally offered in Spring or Summer. Can be taken for credit more than once if the topics are different. Prerequisite: successful completion of ★60 or consent of Instructor.

#### HECOL 493 Selected Topics in Textiles and Clothing

★3 (fi 6) (either term, variable). Normally offered in Spring or Summer. Can be taken for credit more than once if the topics are different. Prerequisite: successful completion of ★60 or consent of Instructor.

## Graduate Courses

#### HECOL 501 Independent Project in Human Ecology

★3 (fi 6) (either term, 0-0-6). Independent study of a topic in human ecology planned by the student in consultation with the Instructor. Independent studies may be taken more than once for credit.

#### HECOL 532 Family Health and Wellness; Theoretical and Measurement Issues for Research and Practice

★3 (fi 6) (either term, 0-3s-0). Critical examination of the conceptualization and measurement of family health and the interrelationships between the health of families and their members. Applications to research and practice in a variety of disciplines including family ecology, nursing, health promotion, occupational therapy, education, and psychology. Not to be taken if credit received in NURS 532.

#### HECOL 550 Selected Topics in Human Ecology

★3 (fi 6) (either term, variable). Topics of current interest. May be taken for credit more than once. Prerequisite: consent of Instructor.

#### HECOL 565 Material Culture, Identities, and Interpretations

★3 (fi 6) (either term, 3-0-0). Examines the relationship between objects and persons in a range of near environments. Also considers how objects may be interpreted through specific social theories.

#### HECOL 569 Material Culture in Practice

★3 (fi 6) (either term, 0-3s-0). Explores how human ecological and material culture approaches contribute to the analysis of a range of contemporary issues in design practice.

#### HECOL 573 Clothing and Material for Sport and Safety

★3 (fi 6) (either term, 3-0-3). A human ecological exploration of the selection, use and performance of clothing and materials used for workplace safety protection and sporting/recreational activities. Prerequisite: consent of instructor. Normally offered in alternate years.

#### HECOL 601 Ways of Knowing in Human Ecology

★3 (fi 6) (first term, 0-3s-0). Enquiry into the nature, scope and object of human ecology knowledge; the distinct contributions of various modes of inquiry; and the relationship between ways of knowing and selected issues related to the acquisition of knowledge, such as ethics and research methods.

#### HECOL 604 Fundamentals of Aging

★3 (fi 6) (either term, 0-3s-0). A critical analysis of the issues and environments that influence the lives of older Canadians. Focus is on theories and knowledge about age-related normative and non-normative changes and their interaction with the physical, social, community and policy environments of older adults.

#### HECOL 610 Review of Issues and Trends in Family Ecology and Practice

★3 (fi 6) (either term, 0-3s-0). Content and philosophy of the study of the family from a human ecological perspective.

#### HECOL 611 Theory in Family Ecology

★3 (fi 6) (either term, 0-3s-0). Consideration of family theory as it relates to

research and practice. Pre- or corequisite: HECOL 610, FAM 601, or consent of Instructor. Credit will only be granted for one of FAM 602 or HECOL 611.

#### HECOL 613 Graduate Practicum in Human Ecology

★3 (*fi 6*) (either term, 0-0-6). Selected practicum placements to integrate theory and practice in a variety of agencies. Prerequisites: consent of Supervisor and Department.

#### HECOL 614 Family Challenges

★3 (*fi 6*) (either term, 0-3s-0). An examination of family dynamics and the processes involved in families' responses to challenges and crises. Application of theory and research to selected current family challenges.

#### HECOL 615 Families and Aging

★3 (*fi 6*) (either term, 0-3s-0). Current issues in mid- and later-life families including relationships between aging parents and adult children, grandparent relationships, family caregiving.

#### HECOL 640 Development and Analysis of Family Policy

★3 (*fi 6*) (either term, 0-3s-0). An examination of the elements of policies and policy issues that affect contemporary Canadian families. The elements of policies and policy issues studied include: their origins and underlying ideologies; their institutional frameworks and foundations; and their substance, nature, and impact on families.

#### HECOL 651 Advanced Independent Inquiry in Human Ecology I

★3 (*fi 6*) (either term, 0-0-6). Prerequisite: consent of Instructor.

#### HECOL 652 Advanced Independent Inquiry in Human Ecology II

★3 (*fi 6*) (either term, 0-0-6). Prerequisite: consent of Instructor

#### HECOL 653 Research Methods for Investigating Causal Relationships

★3 (*fi 6*) (either term, 0-3s-0). An examination of experimental, quasi-experimental, and correlational approaches for investigating causal relationships. Prerequisites: graduate level statistics course or consent of the instructor.

#### HECOL 654 Research Project in Human Ecology

★3-6 (*variable*) (either term, variable). An original research project, conducted with guidance from a faculty member, typically resulting in the preparation of a research report and a submission to a professional academic conference for a poster or paper presentation OR the preparation of a manuscript that is submitted to a scholarly journal for publication. May be taken more than once for credit.

#### HECOL 655 Design and Aesthetics

★1-9 (*variable*) (either term, variable). Modules on creativity theory and practice, computer designing, product development and design communication.

#### HECOL 661 Perspectives on Material Culture

★3 (*fi 6*) (either term, 0-3s-0). A critical analysis of specific issues, theories, and perspectives that influence material culture studies, as a field of research and practice.

#### HECOL 662 Themes in Material Culture

★3 (*fi 6*) (either term, 0-3s-0). A range of perspectives and approaches to theory and research as they are used in the field of material culture studies.

#### HECOL 664 Fashion and Material Culture: Politics, Economies, Societies, c. 1600-1900

★3 (*fi 6*) (either term, 0-3s-0). Examines the evolution and practice of fashion as a social, economic, political and cultural phenomenon from a cross-cultural perspective. Prerequisite: consent of the instructor.

#### HECOL 668 Material Culture and Curatorship

★3 (*fi 6*) (either term, 0-3s-0). Examines the different ways in which artifacts are interpreted and used in both physical and virtual exhibitions. Discussion of different types of artifacts and institutions, registration processes, collection storage, handling and mounting, documentation and exhibition design.

#### HECOL 673 Textile and Apparel Science

★1-9 (*variable*) (either term, variable). Modules on laboratory and field research, fibre theory, soiling and detergency, colour theory and measurement, comfort and protection theory and measurement.

#### HECOL 677 Conservation and Curatorship

★1-8 (*variable*) (either term, variable). Modules on preventive conservation, cleaning and consolidation, and curatorial research.

#### HECOL 680 Review of Issues and Trends in Textiles and Clothing

★3 (*fi 6*) (either term, 0-3s-0). Content and philosophy of the study of textiles and clothing from a human ecological perspective.

#### HECOL 681 Theory in Textiles and Clothing

★3 (*fi 6*) (either term, 0-3s-0). Consideration of textiles and clothing theory as it relates to research and practice.

#### HECOL 682 Program Planning and Evaluation

★3 (*fi 6*) (either term, 0-3s-0). Theories, approaches, and processes fundamental to the development, implementation, and evaluation of programs that effect change and build capacity in families, communities and organizations.

#### HECOL 691 Professional Seminar 1

★1 (*fi 2*) (either term, 0-1s-0). This professional development seminar is one in

a series that provides an introduction to graduate study in the Department of Human Ecology, and to career development and professional issues in human ecology. Topics include: an introduction to the field of human ecology; what it means to be a graduate student; supervisory and professional relationships; research and teaching assistantships; applying for scholarships; professional networking; professional bodies/associations; conferences; academic and practice journals; and academic writing and referencing. Restricted to graduate students in the Department of Human Ecology. Typically taken in the first semester of the graduate program.

#### HECOL 692 Professional Seminar 2

★1 (*fi 2*) (either term, 0-1s-0). This professional development seminar is one in a series that provides an introduction to graduate study in the Department of Human Ecology, and to career development and professional issues in human ecology. Topics include: critical reading of the research literature; ethical issues in conducting research; preparing a submission for the research ethics review board; preparing and reviewing conference submissions; preparing a poster; and preparing a research proposal. Restricted to graduate students in the Department of Human Ecology. Fulfills part of FGSR's mandatory ethics training requirement. Typically taken in the second semester of the graduate program.

#### HECOL 693 Professional Seminar 3

★1 (*fi 2*) (either term, 0-1s-0). This professional development seminar is one in a series that provides an introduction to graduate study in the Department of Human Ecology, and to career development and professional issues in human ecology. Topics include: funding agencies; preparing and reviewing grant proposals; preparing and reviewing manuscripts for publication; oral presentations; writing for different audiences; and preparing for comprehensive exams. Restricted to doctoral level students in the Department of Human Ecology. Typically taken in the third semester of the doctoral program.

#### HECOL 694 Professional Seminar 4

★1 (*fi 2*) (either term, 0-1s-0). This professional development seminar is one in a series that provides an introduction to graduate study in the Department of Human Ecology, and to career development and professional issues in human ecology. Topics include: developing an academic career; obtaining teaching experience and developing a teaching dossier; developing a program of research; working in research teams; authorship; intellectual property issues related to research data; preparing for candidacy exams; surviving your dissertation; preparing a curriculum vita; and applying and interviewing for jobs or post-doctoral fellowships. Restricted to doctoral level students in the Department of Human Ecology. Typically taken in the fourth semester of the doctoral program.

#### HECOL 900 Directed Research Project

★6 (*fi 12*) (either term, 0-0-6). Comprises the capping exercise for the course-based Masters programs. Requirements include conducting an applied research project, and both a written project report and an oral presentation to the Department, and where appropriate, to relevant practising professionals.

## 231.155 Human Resource Management, HRM

Department of Strategic Management and Organization  
Faculty of Business

**Note:** Enrolment in all HRM courses is restricted to students registered in the Faculty of Business, or to students registered in specified programs that require Business courses to meet degree requirements and who have obtained prior approval of their Faculty.

Students who have completed IND R courses are not allowed to register in a HRM course with the same number.

### Graduate Courses

#### HRM 703 Seminar in Human Resource Management Foundations

★3 (*fi 6*) (either term, 3-0-0). A readings seminar that covers related core theories, research and best-practices applications. Topics cover the primary content areas of planning, job design/redesign, recruitment and selection, training and development, performance management, compensation, and various contemporary topics (e.g. international issues). Prerequisite: Registration in a PhD program at the University of Alberta or written permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

## 231.156 Humanités, HUME

Faculté Saint-Jean

### Cours de 1er cycle

#### HUME 420 Les grands écrits

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Étude interdisciplinaire et approfondie

de textes importants relatifs à la pensée humaniste et qui proviennent de plusieurs milieux à différents stades du développement de l'humanité, comme le Yi-king-Le Livre des mutations, Bhagavad-Gitā, la Bible, l'Odyssee (Homère), La République (Platon), Géorgiques (Virgile), La Divine Comédie (Dante), Micromégas (Voltaire), The Wealth of Nations (Smith), The Origin of Species (Darwin), L'Homme et ses symboles (Jung).

## 231.157 Humanities Computing, HUCO

Office of Interdisciplinary Studies  
Faculty of Arts

**Note:** See the following sections for listings of Office of Interdisciplinary programs: Comparative Literature (C LIT); Interdisciplinary (INT D) Faculty of Arts Courses; Middle Eastern and African Studies (MEAS); Religious Studies (RELIG); Science, Technology and Society (STS), and Writing Studies (WRS).

### Graduate Courses

#### HUCO 500 Survey of Humanities Computing

★3 (fi 6) (either term, 0-3s-0).

#### HUCO 510 Theoretical Issues in Humanities Computing

★3 (fi 6) (either term, 0-3s-0). Relationship of computing methods to humanities research from several theoretical perspectives.

#### HUCO 520 Technical Concepts and Approaches in Humanities Computing

★3 (fi 6) (either term, 0-3s-0).

#### HUCO 530 Project Design and Management in Humanities Computing

★3 (fi 6) (either term, 0-3s-0). Design, implementation, management and maintenance of Humanities Computing research projects.

#### HUCO 612 Electronic Texts

★3 (fi 6) (either term, 0-3s-0). Creation, encoding, analysis and management of electronic texts.

#### HUCO 613 Cyberspace and Networked Culture

★3 (fi 6) (either term, 0-3s-0).

#### HUCO 614 Knowledge Management and Analysis in the Humanities

★3 (fi 6) (either term, 0-3s-0). Databases, textbases, graphical and statistical analysis.

#### HUCO 616 Multimedia for the Humanities

★3 (fi 6) (either term, 0-3s-0). Exploration of the nature and cultural significance of multimedia.

#### HUCO 617 Topics in Humanities Computing

★3 (fi 6) (either term, 0-3s-0).

#### HUCO 618 Directed Reading in Humanities Computing

★3 (fi 6) (either term, 0-3s-0).

#### HUCO 620 Research Methods in Humanities Computing

★3 (fi 6) (either term, 0-3s-0). A seminar on research methods appropriate for thesis projects in Humanities Computing.

## 231.158 Hungarian, HUNG

Department of Modern Languages and Cultural Studies  
Faculty of Arts

### Notes

- (1) The Department reserves the right to place students in the language course appropriate to their level of language skill.
- (2) Placement tests may be administered in order to assess prior background. Students with a Hungarian language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in an advanced course more suitable to their level of ability. Students seeking to fulfill their Language Other than English requirement may begin at any one appropriate level, but must take the full ★6 in one language.
- (3) The Department will withhold credit from students completing courses for which prior background is deemed to make them ineligible. For example, 100-level courses are normally restricted to students with little or no prior knowledge in that language. Should a student with matriculation standing, or those possessing prior background (such as native speakers or those for whom it is their first language) register in the 100-level course, credit may be withheld.

### Undergraduate Courses

#### ○ HUNG 111 Beginners' Hungarian I

★3 (fi 6) (either term, 5-0-0). Essentials of grammar, reading and writing with special emphasis on oral skills. Designed to give basic working knowledge of

everyday spoken and written Hungarian. Note: not to be taken by students with native or near native proficiency, or Hungarian 35 or its equivalents in Canada and other countries.

#### ○ HUNG 112 Beginners' Hungarian II

★3 (fi 6) (either term, 5-0-0). Prerequisite: HUNG 111 or consent of Department. Note: not to be taken by students with native or near native proficiency, or Hungarian 35 or its equivalents in Canada and other countries.

#### ○ HUNG 211 Intermediate Hungarian I

★3 (fi 6) (either term, 4-0-0). Advanced grammar and phonetics. Further development of both oral and writing skills as well as acquisition of understanding of certain sociocultural, historical and political spheres of Hungary. Prerequisite: HUNG 112 or Hungarian 35.

#### ○ HUNG 212 Intermediate Hungarian II

★3 (fi 6) (either term, 4-0-0). Prerequisite: HUNG 211 or Hungarian 35.

#### ○ HUNG 303 Advanced Hungarian I

★3 (fi 6) (either term, 3-0-0). Development of conversational and written competence in advanced Hungarian grammar and style on various topics related to the Hungarian language and culture. Prerequisite: HUNG 212 or consent of department.

#### ○ HUNG 304 Advanced Hungarian II

★3 (fi 6) (either term, 3-0-0). Continuation of HUNG 303 with particular emphasis on Hungarian culture. Prerequisite: HUNG 303 or consent of department.

## 231.159 Immunologie, IMINE

Faculté Saint-Jean

### Cours de 1er cycle

#### IMINE 200 Infection et immunité

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction aux principes et aux mécanismes d'immunité dans les eucaryotes. Survol des principaux groupes d'agents infectieux (virus, bactéries, parasites); étude de micro-organismes spécifiques par rapport à la réponse de l'hôte aux agents pathogènes, et stratégies d'évasion à ces agents. Préalables ou concomitant: BIOCM 200 ou BIOCH 203 ou 220, et MICRB 265. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour BIOCH 450.

#### IMINE 371 Introduction à l'immunologie

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Ce cours introduit des concepts d'immunologie. Les sujets abordés incluent la théorie de sélection clonale, la structure et la spécificité des anticorps, les fondements génétiques de la diversité immunologique, l'interaction antigène-anticorps, la réponse immunitaire à médiation cellulaire, les bases moléculaires de la reconnaissance du non-soi, le CMH et la transplantation, principe de tolérance immunitaire, mécanismes d'immunité effectrice, hypersensibilité et immunodéficience. Préalables: BIOCM 200 ou BIOCH 205, BIOLE 207 et IMINE 200. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour INT D 371.

## 231.160 Immunology and Infection, IMIN

Department of Biological Sciences  
Faculty of Science

### Undergraduate Courses

#### ○ IMIN 200 Infection and Immunity

★3 (fi 6) (second term, 3-0-0). Introduces the principles and mechanisms of immunity in eukaryotes. Provides an overview of the major groups of infectious agents (virus, bacteria, parasites) and examines selected microorganisms within the context of the host response to pathogens and pathogen evasion strategies. Pre- or corequisites: BIOCH 200 and MICRB 265. May not be taken for credit if credit already obtained in BIOCH 450. (Offered jointly by the Departments of Biological Sciences and Medical Microbiology and Immunology.) [Biological Sciences].

#### ○ IMIN 324 Basic Virology

★3 (fi 6) (first term, 3-0-0). An introduction to the structure, replication, and taxonomy of bacteriophages, plant, insect, and animal viruses. Their role in disease and methods of control and detection is also discussed. Prerequisites: BIOL 207, IMIN 200 and BIOCH 200 or 205. May not be taken for credit if credit already obtained in INT D 224. (Offered jointly by the Departments of Biological Sciences and of Medical Microbiology and Immunology.) [Biological Sciences]

#### ○ IMIN 371 Introduction to Immunology

★3 (fi 6) (first term, 3-0-0). Survey course introducing the student to immunological concepts. Topics include the clonal selection theory, antibody structure and specificity, genetic basis of immune diversity, antibody-antigen reactions, cell interactions in immune responses, the molecular basis of non-self recognition, MHC molecules and transplantation, tolerance, effector mechanism of immunity, hypersensitivity and immunodeficiency. Prerequisites: BIOCH 200 or 205, BIOL 207,



and IMIN 200. May not be taken for credit if credit already obtained in INT D 371. (Offered jointly by the Department of Biological Sciences and the Department of Medical Microbiology and Immunology.) [Biological Sciences]

#### **IMIN 372 Research Techniques in Immunology**

★3 (fi 6) (second term, 1-0-3). A lecture and laboratory course covering theory and practice behind selected immunological techniques. Techniques covered may include: lymphocyte isolation, flow cytometry, mixed lymphocyte reactions, immunocytochemistry, immunoprecipitation, ELISA, western blotting, expression cloning and monoclonal antibody technology. Labs will sometimes require students to return the next day to check on plates or cultures. Prerequisite: IMIN 371. May not be taken for credit if credit already obtained in INT D 372. (Offered jointly by the Departments of Biological Sciences and Medical Microbiology and Immunology.) [Biological Sciences]

#### **IMIN 401 Comparative Immunology**

★3 (fi 6) (second term, 3-0-0). The phylogeny and evolution of immune systems. Examines the various strategies for disease resistance used by all organisms from plants to humans. The use and evolution of specific components of innate and adaptive immunity will be considered within the context of the biology of the organisms. This course involves both lectures and graded discussions. Prerequisites: IMIN 371 and permission of instructor. Credit cannot be obtained for both IMIN 401 and IMIN 501. (Offered jointly by the Departments of Biological Sciences and Medical Microbiology and Immunology.) [Biological Sciences].

#### **IMIN 405 Innate Immunity**

★3 (fi 6) (first term, 3-0-0). This course covers topics of innate immunity with emphasis on strategies for pathogen recognition, local and systemic activation of the innate immune response, and regulation of innate effector mechanisms. Innate defense strategies against pathogens as well as detection and elimination of tumors will also be covered. Lectures will be followed by active discussions of selected readings pertaining to current research in the subject area. Prerequisites: IMIN 371 or consent of instructor. Credit cannot be obtained for both IMIN 405 and 505. (Offered jointly by the Departments of Biological Sciences and Medical Microbiology and Immunology.) [Biological Sciences].

#### **IMIN 410 Bioinformatics for Molecular Biologists**

★3 (fi 6) (second term, 3-0-1). This course will introduce the student to common and advanced methods in bioinformatics. In a mix of lectures and hands-on computer sessions, the student will solve realistic biological questions in the areas of sequence analysis, distant homology detection, phylogeny, correlating sequence to structure, protein structure analysis, and genomics. The student will obtain a thorough understanding of bioinformatics methods, but the focus is on application of methods in the context of molecular biology research rather than studying details of the algorithms or computer programming. Prerequisite: consent of instructor. BIOCH 320 or 330 highly recommended. Priority given to senior students in the IMIN program. (Offered jointly by the Departments of Biological Sciences and Medical Microbiology and Immunology.) [Biological Sciences].

#### **IMIN 452 Advanced Immunology**

★3 (fi 6) (second term, 3-1s-0). A lecture course on the detailed mechanisms of the immune system, describing recent discoveries in cellular and molecular immunology. Topics include mechanisms of T-cell receptor selection, antigen processing, activation of B and T lymphocytes, cellular collaboration, negative and positive regulatory mechanisms in immunity, transplantation, cytokine actions and interactions, autoimmunity, interaction between immune systems and pathogens, and immunogenetics. Prerequisites: BIOCH 200 and IMIN 371. May not be taken for credit if credit already obtained in MMI 552. (Offered jointly by the Department of Biological Sciences, the Department of Medical Microbiology and Immunology and the Department of Oncology.) [Biological Sciences]

### Graduate Courses

#### **IMIN 501 Advanced Comparative Immunology**

★3 (fi 6) (second term, 3-0-0). The phylogeny and evolution of immune systems. Examines the various strategies for disease resistance used by all organisms from plants to humans. The use and evolution of specific components of innate and adaptive immunity will be considered within the context of the biology of the organisms. Lectures and graded discussions are the same as for IMIN 401, but with additional assignments and evaluation appropriate to graduate studies. Prerequisite: Consent of instructor. Credit cannot be obtained for both IMIN 401 and IMIN 501. (Offered jointly by the Departments of Biological Sciences and Medical Microbiology and Immunology.) [Biological Sciences].

#### **IMIN 505 Advanced Innate Immunity**

★3 (fi 6) (first term, 3-0-0). This course covers topics of innate immunity with emphasis on strategies for pathogen recognition, local and systemic activation of the innate immune response, and regulation of innate effector mechanisms. Innate defense strategies against pathogens as well as detection and elimination of tumors will also be covered. Lectures will be followed by active discussions of selected readings pertaining to current research in the subject area. Lectures and graded discussions are the same as for IMIN 405 but with evaluation appropriate for graduate students. Prerequisites: consent of instructor. Credit cannot be obtained

for both IMIN 405 and 505. (Offered jointly by the Departments of Biological Sciences and Medical Microbiology and Immunology.) [Biological Sciences].

## 231.161 Industrial Relations, IND R

Department of Strategic Management and Organization  
Faculty of Business

### Graduate Courses

#### **IND R 701 Seminar in Industrial Relations Foundations**

★3 (fi 6) (either term, 3-0-0). Readings topics will include industrial relations systems theory, historical development and theories of the labor movement, comparative industrial relations systems, and collective bargaining theory. Prerequisite: Registration in a PhD program at the University of Alberta or written permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

#### **IND R 702 Seminar in Contemporary HRM/IR Issues**

★3 (fi 6) (two term, 3-0-0). An examination of issues and research trends in the field of industrial relations and/or human resources management. Participants will present their own research and actively engage in the analysis and discussion of the work of others. This is a single term course taught over two terms. Prerequisite: Registration in a PhD program at the University of Alberta or written permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

#### **IND R 704 Individual Research**

★3 (fi 6) (either term, 3-0-0).

## 231.162 Informatique, INFOR

Faculté Saint-Jean

### Cours de 1er cycle

#### **INFOR 101 Introduction à l'informatique**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-3). Une introduction générale aux concepts informatiques provenant des sciences et du génie, incluant la représentation des nombres, l'architecture machine et les systèmes d'opération, y compris les algorithmes et leurs propriétés, de même que les techniques de contrôle de séquence, de sélection et de répétition. Y seront également abordés les types de données et les opérations sur ceux-ci en langages de programmation de bas et de haut niveau. Notes: (1) Ce cours s'adresse aux étudiants n'ayant aucune expérience préalable en informatique. (2) Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour INFOR 114.

#### **INFOR 114 Introduction à la programmation**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-3). Une introduction à la résolution de problèmes informatiques à l'aide de programmes écrits dans un langage de haut niveau appelé Java. Initiation aux objets et valeurs, messages et méthodes, structures de contrôle, et conteneurs simples. Discussion des algorithmes de base et des techniques de génie logiciel pour la construction de solutions élégantes et robustes à divers problèmes. Préalable(s): Mathématiques 30 et Informatique 30 ou l'équivalent. Note: Les étudiants n'ayant aucune expérience préalable en informatique doivent suivre INFOR 101.

## 231.163 Integrated Petroleum Geosciences, IPG

Department of Earth and Atmospheric Sciences  
Faculty of Science

### Graduate Courses

#### **IPG 510 Rock Properties, Petrophysics, Well Log Analysis**

★3 (fi 6) (either term, 3-0-0). Basic formation evaluation with emphasis on determination of lithology, porosity, permeability, fluid saturation of reservoir rocks; basic principles of standard downhole wireline logging techniques (gamma ray, spontaneous potential, sonic, density, neutron, resistivity) and interpretation of downhole wireline data; review of some other advanced logging techniques; core sampling methodologies; introduction to modern laboratory petrophysical techniques; core-well log integration. [Faculty of Science]

#### **IPG 512 Seismic Interpretation**

★3 (fi 6) (either term, 3-0-0). This introduction to seismic interpretation will cover the following topics: Overview of reflection seismology; limits to seismic reflection profiling; pitfalls in seismic interpretation; petroleum systems; seismic-to-well ties and seismic phase; structural and stratigraphic interpretation; carbonate reefs and salt; direct hydrocarbon indicators and impedance inversions; amplitude variations

with offset; and use of seismic attributes to assist geologic interpretations. [Faculty of Science]

#### IPG 514 Petroleum Basin Analysis

★3 (*fi 6*) (either term, 3-0-0). Classification and evolution of sedimentary basins; tectonics and sedimentation; methods of sedimentary basin analysis; basin forming mechanisms: classification of basins in a plate-tectonic context; discussion of individual basin types: controls on accommodation and stratigraphic architecture; evaluation of burial and thermal history of sedimentary basins; migration and entrapment in sedimentary basins; exploration applications of basin modeling. [Faculty of Science]

#### IPG 516 Petroleum Production

★3 (*fi 6*) (either term, 3-0-0). Overview of petroleum production in a modern industrial setting. Topics include relationships between geology, basic reservoir rock properties, surface and interfacial phenomena, fluid flow through porous media, classification of oil and natural gas reservoirs, and an introduction to reserve estimation principles and oil recovery strategies. [Faculty of Science]

#### IPG 518 Hydrocarbon Reservoir Analysis

★3 (*fi 6*) (either term, 3-0-0). An analysis of the fundamental geological factors that determine the economic success of producing hydrocarbons from a reservoir: porosity, permeability, compartmentalization by depositional environment and tectonics, and reservoir conditions requiring special drilling and completion techniques. The methods appropriate to appraise a reservoir are reviewed, with an emphasis on placing the factors in the framework of risk analysis. [Faculty of Science]

#### IPG 601 Independent Research Project

★6 (*fi 12*) (either term, 0-0-3). The integrated independent research project may incorporate a variety of aspects of modern geosciences as practised in industry. Students sponsored by a company may use data from industry in these projects. Prerequisites: IPG 510, 512, 514, 516, 518 and ★12 in EAS and/or GEOPH at the 500-level. [Faculty of Science]

#### IPG 610 Seminar and Field Trips

★3 (*fi 6*) (either term, 0-3s-0). May take place all in one week. Series of seminars covering topics such as risk analysis, resource law, resource economics, land issues, environmental impact, government programs, equity markets and their regulation, reserve estimation, downstream petroleum industry, world energy supply and demand, nonconventional hydrocarbon sources. Field trips may include local Alberta geology, visits to drill rigs, enhanced oil recovery operations, and the archival core storage facilities. Attendance is mandatory. The course will be graded on a credit /no credit system. This course may require the payment of additional fees. [Faculty of Science]

## 231.164 Interdisciplinary Undergraduate and Graduate Courses, INT D

### Undergraduate Courses

#### 231.164.1 Faculty of Agricultural, Life and Environmental Sciences Courses

**Note:** Courses listed below are the concern of more than one discipline. Instruction will be offered by members of one or more of the departments or faculties listed beneath the course description. For the following interdisciplinary courses, where the department responsible for registration has been assigned, the department so designated will appear in square brackets following the course description.

##### 0 INT D 303 Economics of World Food and Agriculture

★3 (*fi 6*) (second term, 3-0-0). Economic issues in international agriculture including the world food problem; the role of agriculture in development; agricultural and food trade; biotechnology and associated environmental and globalization issues. Prerequisite: ECON 101 or 102 or consent of Department. Credit will only be given for one of INT D 303, AREC 475 and AG EC 475. (Offered jointly by the Departments of Economics and Rural Economy). [Rural Economy]

##### INT D 410 Interprofessional Health Team Development

★3 (*fi 6*) (either term, 0-3S-0 in 10 weeks). A process learning course intended to provide knowledge, skills and experience in building interprofessional (IP) health care teams comprised of students in various professional programs. Through participation on an interprofessional team of up to 8 students, participants will build their knowledge and skills in the course's four core IP competencies: interprofessional communication, interprofessional collaboration, role clarification and reflection. Emphasis is placed on team processes and tasks while recognizing the unique contributions of patients, families and professionals in working collaboratively to maintain health. (Offered jointly by the following faculties: Agricultural, Life and Environmental Sciences; Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Physical Education and Recreation; and

Rehabilitation Medicine.) (Priority will be given to students in health professions where this is a required course.) [Health Sciences Council].

##### INT D 411 Advanced Interprofessional Team Practice

★0.05-6 (*variable*) (either term, 40 hours). The course is a unique opportunity for students to gain practical, immersive interprofessional (IP) experience in a clinical setting. Health science students will enhance their IP skills and knowledge by building on the IP competencies introduced in INT D 410: interprofessional communication, interprofessional collaboration, role clarification and reflection. (Offered jointly by the following faculties: Agricultural, Life and Environmental Sciences; Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Physical Education and Recreation; and Rehabilitation Medicine.) Prerequisite: INT D 410. [Health Sciences Council].

### 231.164.2 Faculty of Arts Courses

#### Notes

- (1) Courses listed below are the joint concern of the departments stated in the course descriptions. Instructions will be offered by members of one or more of the departments or Faculties listed. Responsibility for registration is with the department shown in square brackets at the end of the description.
- (2) Unless otherwise indicated in the course description, an INT D course may be applied toward either the major or the minor or as an option if it appears under the department's course listings.

##### INT D 125 Topics in Interdisciplinary Studies

★3-6 (*variable*) (variable, variable). Offered by various departments depending upon the content of the course in a given year. [Faculty of Arts]

##### 0 INT D 222 Interdisciplinarity

★3 (*fi 6*) (either term, 3-0-0). Introduction to the history and theories of disciplinarity and interdisciplinarity; how to perform interdisciplinary research and learning. [Faculty of Arts, Office of Interdisciplinary Studies]

##### INT D 225 Topics in Interdisciplinary Studies

★3-6 (*variable*) (variable, variable). Offered by various departments depending upon the content of the course in a given year. [Faculty of Arts]

##### INT D 257 Health Care Economics

★3 (*fi 6*) (either term, 3-0-0). Resource allocation in the health care industry; production and cost relationships within various types of institutional settings (hospital, medical firm) the role of the price mechanism in allocating resources. Manpower planning; the role of the Government and professional groups in allocating resources in the non-price sector of the health industry. (Offered jointly by the Departments of Economics and Public Health Sciences.) [Economics]

##### 0 INT D 303 Economics of World Food and Agriculture

★3 (*fi 6*) (second term, 3-0-0). Economic issues in international agriculture including the world food problem; the role of agriculture in development; agricultural and food trade; biotechnology and associated environmental and globalization issues. Prerequisite: ECON 101 or 102 or consent of Department. Credit will only be given for one of INT D 303, AREC 475 and AG EC 475. (Offered jointly by the Departments of Economics and Rural Economy). [Rural Economy]

##### INT D 311 Language Policy and Planning for Indigenous Language Communities

★3 (*fi 6*) (Spring/Summer, 3-0-0). Language use and attitudes about language within the socio-cultural context of Canadian Indigenous communities. Addresses issues surrounding the health and survivability of Indigenous languages in different types of family, community, and school contexts. Special attention given to Indigenous language advocacy at the family, band, national, and international levels. Training in effective grant-writing techniques included. Restricted to CILLDI program students. (Offered jointly by the following faculties: Arts; Education; and Native Studies.) Prerequisite: LING 101 or LING 111. [Linguistics]

##### INT D 318 Technologies for Endangered Language Documentation

★3 (*fi 6*) (Spring/Summer, 3-0-0). Provides Canadian Indigenous language speakers with the technical skills needed to digitally archive their languages in a database or on the web with text, sound, images, and video. These digital resources can be incorporated into interactive multimedia resources for access by community-based learners and second-language teachers. Restricted to CILLDI program students. (Offered jointly by the following faculties: Arts; Education; and Native Studies.) Prerequisite: LING 101 or LING 111. Note: Not to be taken by students with credit in LING 399 (Techniques for Endangered Language Documentation) or NS 380 (Technologies for Endangered Language Documentation). [Linguistics]

##### INT D 325 Topics in Interdisciplinary Studies

★3-6 (*variable*) (variable, variable). Offered by various departments depending upon the content of the course in a given year. [Faculty of Arts]

##### 0 INT D 333 Mapping Interdisciplinary Studies

★3 (*fi 6*) (either term, 3-0-0). Provides an overview and comparison of the subject matter, types of theory, disciplinary perspectives, and methods utilized in the Faculty of Arts and beyond, to aid students in drawing connections across courses in diverse disciplines. [Faculty of Arts, Office of Interdisciplinary Studies]

**INT D 352 Modern India: An Interdisciplinary Survey**

★3 (fi 6) (either term, 3-0-0). Political, cultural, literary and historical perspectives on the processes of modernization in Indian society of the 19th and 20th centuries, with special attention to Indian nationalism. [Faculty of Arts, Office of Interdisciplinary Studies]

**INT D 393 Political Sociology**

★3 (fi 6) (either term, 3-0-0). A study of how society affects politics and politics affects society. Discussion of the political consequences of economic developments, ideological debates, class conflicts, social movements, elites, gender, nationalisms and state structures. Focus on Canada from a comparative perspective. Prerequisite: POL S 101 or one of SOC 100, 202 or 300. (Offered jointly by the Departments of Political Science and Sociology.) [Political Science]

**INT D 394 Introduction to Criminal Law**

★3 (fi 6) (either term, 3-0-0). Prerequisite: SOC 225. Note: Primarily for BA (Criminology) students. [Sociology]

**INT D 425 Topics in Interdisciplinary Studies**

★3-6 (variable) (variable, variable). Offered by various departments depending upon the content of the course in a given year. [Faculty of Arts]

**INT D 439 Ukrainian Dance**

★3 (fi 6) (either term, 3-0-0). A theoretical and experiential investigation of the forms and history of Ukrainian dance. Course content is focused on the relationships of this dance to Ukrainian as well as Canadian culture, with consideration to its artistic and educational aspects. Offered jointly by the Faculty of Physical Education and Recreation and the Department of Modern Languages and Cultural Studies. [Department of Modern Languages and Cultural Studies] May be taken as a Faculty of Arts course or as a Faculty of Physical Education and Recreation course.

**INT D 520 Combined Honors Essay**

★3-6 (variable) (variable, unassigned). For students in Combined Honors programs. Permission of both Departments is required. Registration in this class may require attendance and participation in specific program seminars. Consult your program advisors. [Faculty of Arts, Undergraduate Student Services]

**231.164.3 Faculty of Business Courses****INT D 361 Fundamentals of Energy, Environment and Sustainability**

★3 (fi 6) (either term, 3-1s-0). Provides an overview of the following topics: fundamentals of conventional (e.g. coal/oil), nonconventional (e.g. oil sands/shale gas), and renewable energy (e.g. wind, solar, hydro, nuclear) sources; definitions, occurrences, amounts exploited and exploitable, as well as environmental impacts on a basic level; regulatory responses and responsibilities, ownership of resources, role of different levels of governments, as well as international obligations, environmental regulations and treaties; elementary economics related to the consumption patterns, prices, production costs, externalities, and relationship to carbon costs and intensities; special attention is paid to technologies involved in a broad sense; cultural and social drivers in each case when appropriate are discussed; concepts of sustainability for energy systems. (Offered by the School of Energy and the Environment) Prerequisite: Completion of ★45 of university-level coursework. [Marketing, Business Economics and Law]

**231.164.4 Faculty of Medicine and Dentistry Courses****INT D 370 Survey on International Health**

★3 (fi 6) (second term, 3-0-0). Overview of health issues and organization in a cross-cultural context with emphasis on developing and newly industrialized countries. Prerequisite: Completion of 10 full courses in any program or consent of Instructor. (Nursing, Dentistry, Medicine, Pharmacy and Pharmaceutical Sciences, Rehabilitation Medicine, and Social Sciences.) [Nursing]

**INT D 409 Research Project**

★3 (fi 6) (second term, 0-0-6). Directed research in a medical laboratory science. Supervisor and research project to be chosen by student. Requires writing a project proposal, keeping an accurate laboratory notebook, conducting adequate experimental research, writing a research paper and presenting a short seminar based on the research. Restricted to fourth-year Medical Laboratory Science students. (Offered jointly by the Department of Medical Microbiology and Immunology, and the Division of Medical Laboratory Science.)

**INT D 410 Interprofessional Health Team Development**

★3 (fi 6) (either term, 0-3S-0 in 10 weeks). A process learning course intended to provide knowledge, skills and experience in building interprofessional (IP) health care teams comprised of students in various professional programs. Through participation on an interprofessional team of up to 8 students, participants will build their knowledge and skills in the course's four core IP competencies: interprofessional communication, interprofessional collaboration, role clarification and reflection. Emphasis is placed on team processes and tasks while recognizing the unique contributions of patients, families and professionals in working collaboratively to maintain health. (Offered jointly by the following faculties: Agricultural, Life and Environmental Sciences; Medicine and Dentistry; Nursing;

Pharmacy and Pharmaceutical Sciences; Physical Education and Recreation; and Rehabilitation Medicine.) (Priority will be given to students in health professions where this is a required course.) [Health Sciences Council].

**INT D 411 Advanced Interprofessional Team Practice**

★0.05-6 (variable) (either term, 40 hours). The course is a unique opportunity for students to gain practical, immersive interprofessional (IP) experience in a clinical setting. Health science students will enhance their IP skills and knowledge by building on the IP competencies introduced in INT D 410: interprofessional communication, interprofessional collaboration, role clarification and reflection. (Offered jointly by the following faculties: Agricultural, Life and Environmental Sciences; Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Physical Education and Recreation; and Rehabilitation Medicine.) Prerequisite: INT D 410. [Health Sciences Council].

**INT D 491 Research Project**

★6 (fi 12) (two term, 0-0-6). Directed research in a medical laboratory science. Supervisor and research project to be chosen by student. Requires writing a project proposal, keeping an accurate laboratory notebook, conducting adequate experimental research, writing a research paper and presenting a short seminar based on the research. Restricted to fourth-year Medical Laboratory Science students. (Offered jointly by the Department of Medical Microbiology and Immunology, and the Division of Medical Laboratory Science.)

**231.164.5 Faculty of Nursing Courses****INT D 370 Survey on International Health**

★3 (fi 6) (second term, 3-0-0). Overview of health issues and organization in a cross-cultural context with emphasis on developing and newly industrialized countries. Prerequisite: Completion of 10 full courses in any program or consent of Instructor. (Nursing, Dentistry, Medicine, Pharmacy and Pharmaceutical Sciences, Rehabilitation Medicine, and Social Sciences.) [Nursing]

**INT D 410 Interprofessional Health Team Development**

★3 (fi 6) (either term, 0-3S-0 in 10 weeks). A process learning course intended to provide knowledge, skills and experience in building interprofessional (IP) health care teams comprised of students in various professional programs. Through participation on an interprofessional team of up to 8 students, participants will build their knowledge and skills in the course's four core IP competencies: interprofessional communication, interprofessional collaboration, role clarification and reflection. Emphasis is placed on team processes and tasks while recognizing the unique contributions of patients, families and professionals in working collaboratively to maintain health. (Offered jointly by the following faculties: Agricultural, Life and Environmental Sciences; Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Physical Education and Recreation; and Rehabilitation Medicine.) (Priority will be given to students in health professions where this is a required course.) [Health Sciences Council].

**INT D 411 Advanced Interprofessional Team Practice**

★0.05-6 (variable) (either term, 40 hours). The course is a unique opportunity for students to gain practical, immersive interprofessional (IP) experience in a clinical setting. Health science students will enhance their IP skills and knowledge by building on the IP competencies introduced in INT D 410: interprofessional communication, interprofessional collaboration, role clarification and reflection. (Offered jointly by the following faculties: Agricultural, Life and Environmental Sciences; Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Physical Education and Recreation; and Rehabilitation Medicine.) Prerequisite: INT D 410. [Health Sciences Council].

**231.164.6 Faculty of Pharmacy and Pharmaceutical Sciences Courses****INT D 370 Survey on International Health**

★3 (fi 6) (second term, 3-0-0). Overview of health issues and organization in a cross-cultural context with emphasis on developing and newly industrialized countries. Prerequisite: Completion of 10 full courses in any program or consent of Instructor. (Nursing, Dentistry, Medicine, Pharmacy and Pharmaceutical Sciences, Rehabilitation Medicine, and Social Sciences.) [Nursing]

**INT D 410 Interprofessional Health Team Development**

★3 (fi 6) (either term, 0-3S-0 in 10 weeks). A process learning course intended to provide knowledge, skills and experience in building interprofessional (IP) health care teams comprised of students in various professional programs. Through participation on an interprofessional team of up to 8 students, participants will build their knowledge and skills in the course's four core IP competencies: interprofessional communication, interprofessional collaboration, role clarification and reflection. Emphasis is placed on team processes and tasks while recognizing the unique contributions of patients, families and professionals in working collaboratively to maintain health. (Offered jointly by the following faculties: Agricultural, Life and Environmental Sciences; Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Physical Education and Recreation; and Rehabilitation Medicine.) (Priority will be given to students in health professions where this is a required course.) [Health Sciences Council].



**INT D 411 Advanced Interprofessional Team Practice**

★0.05-6 (*variable*) (either term, 40 hours). The course is a unique opportunity for students to gain practical, immersive interprofessional (IP) experience in a clinical setting. Health science students will enhance their IP skills and knowledge by building on the IP competencies introduced in INT D 410: interprofessional communication, interprofessional collaboration, role clarification and reflection. (Offered jointly by the following faculties: Agricultural, Life and Environmental Sciences; Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Physical Education and Recreation; and Rehabilitation Medicine.) Prerequisite: INT D 410. [Health Sciences Council].

**231.164.7 Faculty of Physical Education and Recreation Courses****INT D 410 Interprofessional Health Team Development**

★3 (*fi 6*) (either term, 0-3S-0 in 10 weeks). A process learning course intended to provide knowledge, skills and experience in building interprofessional (IP) health care teams comprised of students in various professional programs. Through participation on an interprofessional team of up to 8 students, participants will build their knowledge and skills in the course's four core IP competencies: interprofessional communication, interprofessional collaboration, role clarification and reflection. Emphasis is placed on team processes and tasks while recognizing the unique contributions of patients, families and professionals in working collaboratively to maintain health. (Offered jointly by the following faculties: Agricultural, Life and Environmental Sciences; Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Physical Education and Recreation; and Rehabilitation Medicine.) (Priority will be given to students in health professions where this is a required course.) [Health Sciences Council].

**INT D 411 Advanced Interprofessional Team Practice**

★0.05-6 (*variable*) (either term, 40 hours). The course is a unique opportunity for students to gain practical, immersive interprofessional (IP) experience in a clinical setting. Health science students will enhance their IP skills and knowledge by building on the IP competencies introduced in INT D 410: interprofessional communication, interprofessional collaboration, role clarification and reflection. (Offered jointly by the following faculties: Agricultural, Life and Environmental Sciences; Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Physical Education and Recreation; and Rehabilitation Medicine.) Prerequisite: INT D 410. [Health Sciences Council].

**0 INT D 439 Ukrainian Dance**

★3 (*fi 6*) (either term, 3-0-0). A theoretical and experiential investigation of the forms and history of Ukrainian dance. Course content is focused on the relationships of this dance to Ukrainian as well as Canadian culture, with consideration to its artistic and educational aspects. Offered jointly by the Faculty of Physical Education and Recreation and the Department of Modern Languages and Cultural Studies. [Department of Modern Languages and Cultural Studies] May be taken as a Faculty of Arts course or as a Faculty of Physical Education and Recreation course.

**231.164.8 Faculty of Rehabilitation Medicine Courses****INT D 370 Survey on International Health**

★3 (*fi 6*) (second term, 3-0-0). Overview of health issues and organization in a cross-cultural context with emphasis on developing and newly industrialized countries. Prerequisite: Completion of 10 full courses in any program or consent of Instructor. (Nursing, Dentistry, Medicine, Pharmacy and Pharmaceutical Sciences, Rehabilitation Medicine, and Social Sciences.) [Nursing]

**INT D 410 Interprofessional Health Team Development**

★3 (*fi 6*) (either term, 0-3S-0 in 10 weeks). A process learning course intended to provide knowledge, skills and experience in building interprofessional (IP) health care teams comprised of students in various professional programs. Through participation on an interprofessional team of up to 8 students, participants will build their knowledge and skills in the course's four core IP competencies: interprofessional communication, interprofessional collaboration, role clarification and reflection. Emphasis is placed on team processes and tasks while recognizing the unique contributions of patients, families and professionals in working collaboratively to maintain health. (Offered jointly by the following faculties: Agricultural, Life and Environmental Sciences; Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Physical Education and Recreation; and Rehabilitation Medicine.) (Priority will be given to students in health professions where this is a required course.) [Health Sciences Council].

**INT D 411 Advanced Interprofessional Team Practice**

★0.05-6 (*variable*) (either term, 40 hours). The course is a unique opportunity for students to gain practical, immersive interprofessional (IP) experience in a clinical setting. Health science students will enhance their IP skills and knowledge by building on the IP competencies introduced in INT D 410: interprofessional communication, interprofessional collaboration, role clarification and reflection. (Offered jointly by the following faculties: Agricultural, Life and Environmental

Sciences; Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Physical Education and Recreation; and Rehabilitation Medicine.) Prerequisite: INT D 410. [Health Sciences Council].

**231.164.9 School of Public Health Courses****INT D 257 Health Care Economics**

★3 (*fi 6*) (either term, 3-0-0). Resource allocation in the health care industry; production and cost relationships within various types of institutional settings (hospital, medical firm) the role of the price mechanism in allocating resources. Manpower planning; the role of the Government and professional groups in allocating resources in the non-price sector of the health industry. (Offered jointly by the Departments of Economics and Public Health Sciences.) [Economics]

**Graduate Courses****231.164.10 Faculty of Agricultural, Life and Environmental Sciences Courses****INT D 500 An Introduction to Community-Based Research and Evaluation**

★3 (*fi 6*) (either term, 0-3s-0). An introduction to conceptual and methodological foundations of community-based research and evaluation in the health and social sciences, particularly pertaining to the development of children, youth, and/or families. Seminar format. Prerequisite: Consent of instructor. [Health Sciences Council: Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Rehabilitation Medicine; Physical Education and Recreation; Agricultural, Life and Environmental Sciences; School of Public Health; Augustana Faculty]

**INT D 525 Commensal Bacteria and Gastrointestinal Health**

★3 (*fi 6*) (second term, 3-0-0). Integrated exploration of concepts and research methods pertaining to gastrointestinal physiology, gastrointestinal disorders, and the role of the commensal microbiota in health and disease of humans and animals. Tools to modify the function of the intestinal microflora for prevention or treatment of disease by administration of probiotic bacteria or by administration of prebiotics. Offered in alternate years commencing 2008/09. Prerequisites: (★3 Microbiology or ★3 Immunology) and consent of instructor. Offered jointly by the Departments of Agricultural, Food and Nutritional Science and Medicine. [Agricultural, Food and Nutritional Science]

**0 INT D 565 Natural Resource and Environmental Economics**

★3 (*fi 6*) (either term, 3-0-0). Economic analysis of renewable resource and environmental issues. Renewable resource theory with applications to the fishery, forestry, soils and wildlife. Economic analysis of environmental protection and policy. Topics in applied benefit-cost analysis including the valuation of non-market goods and services. Prerequisite: consent of Instructor; (AREC 313 or AG EC 416) and (AREC 502 or AG EC 502) recommended. (Offered jointly by the Departments of Rural Economy and Economics.) [Rural Economy]

**INT D 665 Natural Resource Utilization**

★3 (*fi 6*) (either term, 3-0-0). Economics of utilizing and conserving land, water and energy resources in Agriculture and Forestry. Prerequisite: INT D 365 or AREC 365. Not available for students with credit in INT D 465 or AREC 465. Available only to students in MBA/MAG, MBA/MF, MBA in Natural Resource and Energy Programs, or by consent of Department. [Rural Economy]

**231.164.11 Faculty of Arts Courses****INT D 554 Research in Cognitive Science**

★3 (*fi 6*) (either term, 3-0-0). A multidisciplinary survey of theoretical issues and research practices in Cognitive Science to be taught by various members of such Departments as Psychology, Computing Science, Linguistics, and Philosophy. Prerequisites: consent of course coordinator and consent of student's home department. [Psychology] May be taken as a Faculty of Science course. [Faculty of Arts]

**INT D 593 Seminar in Political Sociology**

★3 (*fi 6*) (either term, 0-3s-0).

**231.164.12 Faculty of Augustana Courses****INT D 500 An Introduction to Community-Based Research and Evaluation**

★3 (*fi 6*) (either term, 0-3s-0). An introduction to conceptual and methodological foundations of community-based research and evaluation in the health and social sciences, particularly pertaining to the development of children, youth, and/or families. Seminar format. Prerequisite: Consent of instructor. [Health Sciences Council: Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Rehabilitation Medicine; Physical Education and Recreation; Agricultural, Life and Environmental Sciences; School of Public Health; Augustana Faculty]

## 231.164.13 Faculty of Business Courses

### INT D 561 Energy and Environment: An Interdisciplinary View of Research and Issues

★3 (fi 6) (either term, 3-0-0). The course provides students with an overview of research issues in energy and environment across the various disciplines. The objective is for students from all disciplines to acquire a better understanding of the various methodological and disciplinary approaches involved in the study of energy and the environment. [Marketing, Business Economics and Law]

## 231.164.14 Faculty of Extension Courses

### INT D 500 An Introduction to Community-Based Research and Evaluation

★3 (fi 6) (either term, 0-3s-0). An introduction to conceptual and methodological foundations of community-based research and evaluation in the health and social sciences, particularly pertaining to the development of children, youth, and/or families. Seminar format. Prerequisite: Consent of instructor. [Health Sciences Council: Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Rehabilitation Medicine; Physical Education and Recreation; Agricultural, Life and Environmental Sciences; School of Public Health; Augustana Faculty]

## 231.164.15 Faculty of Medicine and Dentistry Courses

### INT D 500 An Introduction to Community-Based Research and Evaluation

★3 (fi 6) (either term, 0-3s-0). An introduction to conceptual and methodological foundations of community-based research and evaluation in the health and social sciences, particularly pertaining to the development of children, youth, and/or families. Seminar format. Prerequisite: Consent of instructor. [Health Sciences Council: Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Rehabilitation Medicine; Physical Education and Recreation; Agricultural, Life and Environmental Sciences; School of Public Health; Augustana Faculty]

### INT D 570 Healthcare Ethics

★3 (fi 6) (either term, 0-3s-0). An interdisciplinary course exploring selected topics in bioethics. Includes examination of ethical theories and principles within the context of clinical practice (nursing, medicine, rehabilitation medicine, dentistry, pharmacy) and learning experiences to improve moral reasoning and ethical decision making. Prerequisite: consent of Instructors. [Faculty of Nursing, Faculty of Medicine and Dentistry, John Dossetor Health Ethics Centre]

### INT D 600 Building Foundations

★3 (fi 6) (first term, 3-0-0). Transdisciplinary/interdisciplinary lecture series on maternal-fetal-newborn health are presented; Defining and navigating the challenges of conducting Interdisciplinary research, defining conceptual frameworks, research resources, research approaches to MFN health, research grant funding structures and grant review, communicating outside of academia, and a variety of maternal-fetal-newborn transdisciplinary health topics; genetics, neuroscience, pharmacology, physiology, nursing, health population outcomes. Four projects involving transdisciplinary/interdisciplinary composition related to the lecture series will be required.

### INT D 670 Research Ethics

★3 (fi 6) (either term, 0-3s-0). Examines the ethical issues which arise in research involving human subjects. Research methods studied may include clinical trials, surveys, secondary analysis of stored data, and the observation of public behavior. Problems encountered in studying particular populations, such as children or persons with dementia, will also be studied. Prerequisite: consent of Instructor. [Faculty of Nursing, Faculty of Medicine and Dentistry, John Dossetor Health Ethics Centre].

## 231.164.16 Faculty of Nursing Courses

### INT D 500 An Introduction to Community-Based Research and Evaluation

★3 (fi 6) (either term, 0-3s-0). An introduction to conceptual and methodological foundations of community-based research and evaluation in the health and social sciences, particularly pertaining to the development of children, youth, and/or families. Seminar format. Prerequisite: Consent of instructor. [Health Sciences Council: Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Rehabilitation Medicine; Physical Education and Recreation; Agricultural, Life and Environmental Sciences; School of Public Health; Augustana Faculty]

### INT D 540 Principles of Qualitative Inquiry

★3 (fi 6) (either term, 0-3s-0). This course covers the basics of qualitative research including theoretical underpinnings, main methods, sampling, data collection, analysis and proposal writing. It serves as a strong introduction to qualitative inquiry. This course is designed as a graduate seminar. While some classes will be structured, the intent is to learn from each other's experiences and their research examples. Credit will not be granted to students who have previously received credit for INT D 560 -Principles of Qualitative Inquiry.

### INT D 560 Selected Topics in Nursing

★3 (fi 6) (either term, 0-3s-0). Selected topics in a variety of advanced nursing

practice specialty areas. The role of the advanced practice nurse is examined from varying perspectives.

### INT D 570 Healthcare Ethics

★3 (fi 6) (either term, 0-3s-0). An interdisciplinary course exploring selected topics in bioethics. Includes examination of ethical theories and principles within the context of clinical practice (nursing, medicine, rehabilitation medicine, dentistry, pharmacy) and learning experiences to improve moral reasoning and ethical decision making. Prerequisite: consent of Instructors. [Faculty of Nursing, Faculty of Medicine and Dentistry, John Dossetor Health Ethics Centre]

### INT D 577 Spiritual Assessment in the Promotion of Health

★3 (fi 6) (either term, 0-3s-0). As an element of whole person health assessment, "spiritual assessment" is of interest to a broad spectrum of health as well as ministry professionals. Emphasis is placed on consideration of theories and skills needed for the practice of spiritual assessment. The course provides a context for interdisciplinary reflection on understandings of the human person, health, health promotion, spirituality, spiritual needs, and spiritual care. Students are invited to explore their own spirituality and various approaches to assessing the spiritual based on a variety of definitions and understandings of spirituality. Specific models and tools for spiritual assessment will be considered, two will be looked at in depth, and students will have opportunities to bring theory as well as experience together in both group and individual exercises of spiritual assessment rooted in their ministry/health practice.

### INT D 670 Research Ethics

★3 (fi 6) (either term, 0-3s-0). Examines the ethical issues which arise in research involving human subjects. Research methods studied may include clinical trials, surveys, secondary analysis of stored data, and the observation of public behavior. Problems encountered in studying particular populations, such as children or persons with dementia, will also be studied. Prerequisite: consent of Instructor. [Faculty of Nursing, Faculty of Medicine and Dentistry, John Dossetor Health Ethics Centre].

### INT D 690 Topics in Knowledge Utilization

★3 (fi 6) (either term, 0-3s-0). Examines the scientific, theoretical, and historical underpinnings of the field of knowledge utilization. Covers contemporary manifestations of knowledge utilization in Canadian society such as evidence based decision-making, and in health care such as evidence-based practice and evidence-based medicine. It addresses the challenges of knowledge use in health care organizations and will focus on the central conceptual and methodological challenges facing investigators undertaking knowledge utilization research. Prerequisite: consent of Instructor.

## 231.164.17 Faculty of Pharmacy and Pharmaceutical Sciences Courses

### INT D 500 An Introduction to Community-Based Research and Evaluation

★3 (fi 6) (either term, 0-3s-0). An introduction to conceptual and methodological foundations of community-based research and evaluation in the health and social sciences, particularly pertaining to the development of children, youth, and/or families. Seminar format. Prerequisite: Consent of instructor. [Health Sciences Council: Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Rehabilitation Medicine; Physical Education and Recreation; Agricultural, Life and Environmental Sciences; School of Public Health; Augustana Faculty]

## 231.164.18 Faculty of Physical Education and Recreation Courses

### INT D 500 An Introduction to Community-Based Research and Evaluation

★3 (fi 6) (either term, 0-3s-0). An introduction to conceptual and methodological foundations of community-based research and evaluation in the health and social sciences, particularly pertaining to the development of children, youth, and/or families. Seminar format. Prerequisite: Consent of instructor. [Health Sciences Council: Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Rehabilitation Medicine; Physical Education and Recreation; Agricultural, Life and Environmental Sciences; School of Public Health; Augustana Faculty]

## 231.164.19 Faculty of Rehabilitation Medicine Courses

### INT D 500 An Introduction to Community-Based Research and Evaluation

★3 (fi 6) (either term, 0-3s-0). An introduction to conceptual and methodological foundations of community-based research and evaluation in the health and social sciences, particularly pertaining to the development of children, youth, and/or families. Seminar format. Prerequisite: Consent of instructor. [Health Sciences Council: Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Rehabilitation Medicine; Physical Education and Recreation; Agricultural, Life and Environmental Sciences; School of Public Health; Augustana Faculty]

### INT D 601 Seminar in Bone and Joint Health Research

★3 (fi 6) (two term, 0-1.5s-0). Credit. This seminar is designed to expose students

to the scope of transdisciplinary research in bone and joint health. Students attend monthly seminars presented by faculty members and graduate students from a variety of health sciences and engineering faculties. Open to graduate students in the Alberta Provincial CIHR Training Program in Bone and Joint Health, and to others with consent of the instructor.

#### INT D 602 Transdisciplinary Bone and Joint Health Research

★3 (fi 6) (either term, 2-2s-0). Designed to allow students to explore select issues in interdisciplinary bone and joint health research from basic science to population health. Open to graduate students in the Alberta Provincial CIHR Training Program in Bone and Joint Health, and to others with consent of Instructor.

#### INT D 603 Directed Study in Bone and Joint Health Research

★3 (fi 6) (either term, 0-3s-0). Work on a special transdisciplinary project to meet individualized objectives under the supervision of a faculty member. Open to graduate students in the Alberta Provincial CIHR Training Program in Bone and Joint Health, and to others with consent of Instructor.

## 231.164.20 Faculty of Science Courses

#### INT D 554 Research in Cognitive Science

★3 (fi 6) (either term, 3-0-0). A multidisciplinary survey of theoretical issues and research practices in Cognitive Science to be taught by various members of such Departments as Psychology, Computing Science, Linguistics, and Philosophy. Prerequisites: consent of course coordinator and consent of student's home department. [Psychology] May be taken as a Faculty of Science course. [Faculty of Arts]

## 231.164.21 School of Public Health Courses

#### INT D 500 An Introduction to Community-Based Research and Evaluation

★3 (fi 6) (either term, 0-3s-0). An introduction to conceptual and methodological foundations of community-based research and evaluation in the health and social sciences, particularly pertaining to the development of children, youth, and/or families. Seminar format. Prerequisite: Consent of instructor. [Health Sciences Council: Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Rehabilitation Medicine; Physical Education and Recreation; Agricultural, Life and Environmental Sciences; School of Public Health; Augustana Faculty]

## 231.165 Italian, ITAL

Department of Modern Languages and Cultural Studies  
Faculty of Arts

### Undergraduate Courses

#### Notes

- (1) The Department reserves the right to place students in the language course appropriate to their level of language skill.
- (2) Placement tests may be administered in order to assess prior background. Students with an Italian language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in an advanced course more suitable to their level of ability. Students seeking to fulfill their Language Other than English requirement may begin at any one appropriate level, but must take the full ★6 in one language.
- (3) The Department will withhold credit from students completing courses for which prior background is deemed to make them ineligible. For example, 100-level courses are normally restricted to students with little or no prior knowledge in that language. Should a student with matriculation standing, or those possessing prior background (such as native speakers or those for whom it is their first language) register in the 100-level course, credit may be withheld.
- (4) See also listings under Modern Languages and Cultural Studies (MLCS).

#### ITAL 111 Beginners' Italian I

★3 (fi 6) (either term, 5-0-0). Italian grammar and pronunciation. Readings of easy texts dealing with different aspects of Italian culture. Note: not to be taken by students with credit in ITAL 100, or with native or near native proficiency, or with Italian 30 or its equivalents in Canada and other countries.

#### ITAL 112 Beginners' Italian II

★3 (fi 6) (either term, 5-0-0). Prerequisite: ITAL 111 or consent of Department. Note: not to be taken by students with credit in ITAL 100, or with native or near native proficiency, or with Italian 30 or its equivalents in Canada and other countries.

#### ITAL 205 Topics in Italian Studies

★3 (fi 6) (either term, 3-0-0). Modern Italy studied through its cultural context and forms of expression. The course will be taught in English.

#### ITAL 211 Second-Year Italian I

★3 (fi 6) (either term, 4-0-0). Selected contemporary prose and poetry. Advanced

grammar and phonetics. Prerequisite: Italian 30 (or equivalent) or ITAL 112 or consent of Department. Note: not to be taken by students with credit in ITAL 250.

#### ITAL 212 Second-Year Italian II

★3 (fi 6) (either term, 4-0-0). Prerequisite: ITAL 211 or consent of Department. Note: not to be taken by students with credit in ITAL 250.

#### ITAL 333 Topics in Italian Short Stories

★3 (fi 6) (either term, 3-0-0). Prerequisite: ITAL 212 or consent of Department. Note: Not open to students with credit in ITAL 331 or 332.

#### ITAL 340 Topics in Italian Culture

★3 (fi 6) (either term, 3-0-0). Prerequisite: ITAL 212 or consent of Department.

#### ITAL 363 Studies in Italian Literary Genres

★3 (fi 6) (either term, 3-0-0). Prerequisite: ITAL 212 or consent of Department.

#### ITAL 393 Grammar, Composition and Translation

★3 (fi 6) (either term, 3-0-0). Prerequisite: ITAL 212 or consent of Department. Note: Not to be taken by students with credit in ITAL 394 or 395.

#### ITAL 415 Studies in Italian Literature

★3 (fi 6) (either term, 3-0-0). Prerequisite: A 300-level course in Italian literature or consent of Department.

#### ITAL 419 Topics in Italian Studies I

★3 (fi 6) (either term, 3-0-0). Prerequisite: A 300-level course in Italian literature or consent of Department.

#### ITAL 420 Topics in Italian Studies II

★3 (fi 6) (either term, 3-0-0). Prerequisite: A 300-level course in Italian literature or consent of Department.

#### ITAL 425 Translation

★3 (fi 6) (either term, 3-0-0). Literary and technical translation from English to Italian. Prerequisite: ITAL 393 or consent of Department.

#### ITAL 495 Honors Thesis

★3 (fi 6) (either term, 0-3s-0).

#### ITAL 499 Special Topics

★3 (fi 6) (either term, 3-0-0).

## Graduate Courses

#### ITAL 515 Studies in Italian Literature

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

#### ITAL 519 Topics in Italian Studies I

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

#### ITAL 521 Topics in Italian Studies II

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

#### ITAL 599 Directed Reading

★3 (fi 6) (either term, 3-0-0).

#### ITAL 698 Topics in Italian Linguistics

★3 (fi 6) (either term, 3-0-0).

#### ITAL 699 Topics in Italian Literature and Culture

★3 (fi 6) (either term, 3-0-0).

## 231.166 Japanese, JAPAN

Department of East Asian Studies  
Faculty of Arts

#### Notes

- (1) The Department reserves the right to place students in the language course appropriate to their level of language skill.
- (2) Placement tests may be administered in order to assess prior background. Students with an Asian (Chinese, Japanese, Korean) language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in a more advanced course suitable to their level of ability or they may be encouraged to seek "Credit by Special Assessment" (see §44.5) when appropriate.
- (3) The Department will withhold credit from students completing courses for which prior background is deemed to make them ineligible. For example, 100-level courses are normally restricted to students with little or no prior knowledge in that language. Should a student with matriculation standing, or those possessing prior background (such as native speakers or those for whom it is their first language) register in the 100-level courses, credit may be withheld.

### Undergraduate Courses

#### JAPAN 101 Basic Japanese I

★3 (fi 6) (either term, 5-0-0). A non-intensive written course designed to develop



basic skills in spoken and written Japanese. Note: Not open to students with credit in Japanese 30, 35, JAPAN 150 or equivalent.

**O JAPAN 102 Basic Japanese II**

★3 (fi 6) (either term, 5-0-0). A continuation of JAPAN 101. Prerequisite: JAPAN 101 or equivalent. Note: Not open to students with credit in Japanese 30, 35, JAPAN 150 or equivalent.

**L JAPAN 150 First-Year University Japanese**

★3 (fi 6) (either term, 5-0-0). A non-intensive course designed for students who have some previous knowledge of spoken and written Japanese but need further training in grammar. Prerequisite: Japanese 30, 35 or equivalent.

**O JAPAN 201 Basic Japanese III**

★3 (fi 6) (either term, 5-0-0). A non-intensive course designed to develop further basic skills in spoken and written Japanese. Prerequisite: JAPAN 102 or 150 with a minimum grade of C+, or consent of Department.

**O JAPAN 202 Basic Japanese IV**

★3 (fi 6) (either term, 5-0-0). A continuation of JAPAN 201. Prerequisite: JAPAN 201 with a minimum grade of C+, or consent of Department.

**O JAPAN 240 Japanese Literature and the Arts**

★3 (fi 6) (either term, 3-0-0). The relationship between modern literature and pre-modern literature and visual arts: painting, prints, manga, calligraphy. Taught in English. No prerequisite. Note: Not open to students with credit in JAPAN 340. This course will not fulfill the language other than English Requirement of the BA.

**O JAPAN 241 Overview of the Japanese Language System**

★3 (fi 6) (either term, 3-0-0). To be taken concurrently with JAPAN 201 or 202. Taught in English. Note: This course will not fulfill the Language other than English requirement of the BA degree. Note: Not open to students with credit in or completing JAPAN 301.

**O JAPAN 242 The Samurai in Japanese Culture**

★3 (fi 6) (either term, 3-0-0). This course focuses on the rise and fall of Japan's warrior class, as well as the construction of samurai mythology (both positive and negative) in Japanese popular culture and the Western imagination. Note: This course will not fulfill the Language other than English requirement of the BA degree.

**O JAPAN 301 Intermediate Japanese I**

★3 (fi 6) (either term, 4-0-0). Designed to develop basic reading skills in modern Japanese prose with special emphasis on grammar and usage. Prerequisite: JAPAN 202 with a minimum grade of C+, or consent of Department.

**O JAPAN 302 Intermediate Japanese II**

★3 (fi 6) (either term, 4-0-0). A continuation of JAPAN 301. Prerequisite: JAPAN 301 with a minimum grade of C+, or consent of Department.

**O JAPAN 321 Pre-Modern Japanese Literature in Translation**

★3 (fi 6) (either term, 3-0-0). Exploration of traditional Japanese culture through lived experience of Japanese people preserved in literary texts spanning more than a millennium. Prerequisite: JAPAN 240, or consent of the Department. Note: This course will not fulfill the Language other than English requirement of the BA degree.

**O JAPAN 322 Modern Japanese Literature in Translation**

★3 (fi 6) (either term, 3-0-0). Selected works by prominent writers from 1868 to the present. Prerequisite: JAPAN 240, or consent of the Department. Note: This course will not fulfill the Language other than English requirement of the BA degree.

**O JAPAN 325 Introduction to Japanese Linguistics**

★3 (fi 6) (either term, 3-0-0). Sound system, parts of speech, basic sentence structure, writing system, and language change and variation. Taught in English. Note: not open to students with credit in JAPAN 225. This course will not fulfill the Language Other than English requirement of the BA degree. Prerequisite: LING 101 and ★3 from JAPAN 202, 241, or consent of Department.

**O JAPAN 326 Japanese Sociolinguistics**

★3 (fi 6) (either term, 3-0-0). Introduction to social and interactional aspects of the Japanese language. Note: This course will not fulfill the Language Other than English requirement of the BA degree. Prerequisite: JAPAN 301 and 325 (formerly 225) or equivalent.

**JAPAN 329 Cross-cultural Communication: Japanese, English, and Beyond**

★3 (fi 6) (either term, 3-0-0). Prerequisite: JAPAN 202 or consent of department.

**O JAPAN 330 Japanese Literature and Film**

★3 (fi 6) (either term, 3-0-0). Sub-titled film and animation adaptations of literary works from the modern and pre-modern eras. Note: Not open to students with credit in JAPAN 430. This course will not fulfill the language other than English requirement of the BA.

**JAPAN 332 Premodern Japan: Society, Culture and Customs**

★3 (fi 6) (either term, 3-0-0). Explores the lives, ideas and customs of people

in premodern Japan. Readings and lectures in English. Prerequisite: JAPAN 240, JAPAN 242 or consent of the Department. Note: Does not fulfill any Faculty of Arts requirement for a Language other than English.

**O JAPAN 333 Tales of Two Japanese Cities**

★3 (fi 6) (either term, 3-0-0). Explores Japanese society through two of its most important cities; Kyoto and Tokyo. Prerequisite: JAPAN 240, 242, or consent of the department.

**O JAPAN 341 Classical Japanese I**

★3 (fi 6) (either term, 3-0-0). Introduction to the classical Japanese language, involving study of classical Japanese grammar and reading of primary texts. Not a literature course. Prerequisite: JAPAN 202 and 241, or consent of the Department.

**O JAPAN 360 Japanese Religion through Literature**

★3 (fi 6) (either term, 3-0-0). Japanese religion through pre-modern literary texts. Emphasis on mythology, poetry, Shintō-Buddhist synthesis, angry ghosts and karmic retribution. Note: does not fulfill any Faculty of Arts Language Other than English requirement.

**O JAPAN 401 Advanced Japanese I**

★3 (fi 6) (either term, 3-0-0). An advanced course designed to develop skills in spoken and written Japanese with special emphasis on the acquisition of an extensive vocabulary. Prerequisite: JAPAN 302 with a minimum grade of C+, or consent of Department.

**O JAPAN 402 Advanced Japanese II**

★3 (fi 6) (either term, 3-0-0). A continuation of JAPAN 401. Prerequisite: JAPAN 401 with a minimum grade of C+, or consent of Department.

**O JAPAN 416 Japanese Theatre from the Noh to the Avant-garde**

★3 (fi 6) (either term, 3-0-0). The course will discuss, in English, forms of Japanese drama from the Noh to modern theatre. Prerequisite: JAPAN 321 or any 300-level literature or drama course. Note: This course will not fulfill the Language other than English requirement of the BA degree.

**O JAPAN 421 Topics in Japanese Literary History**

★3 (fi 6) (either term, 3-0-0). The major works in English translation of a particular historical period in pre-twentieth century Japan, in their cultural and social contexts. Focus will be on one of the following: ancient, classical, medieval or early modern period. Prerequisite: JAPAN 321 or any other 300-level literature course. Note: May be repeated for credit when course content differs. Does not fulfill any Faculty of Arts Language other than English requirement.

**O JAPAN 425 Japanese Linguistics**

★3 (fi 6) (either term, 3-0-0). Discussion of the major linguistic features of the Japanese language. Lectures in English. Prerequisite: JAPAN 302 and 325 or consent of Department.

**JAPAN 427 Practical Japanese Linguistics**

★3 (fi 6) (either term, 3-0-0). Practical linguistic knowledge for effective learning of Japanese as a second language. Prerequisite: JAPAN 225 or 325, and 302 or consent of Department.

**O JAPAN 429 Japanese-English Translation**

★3 (fi 6) (either term, 3-0-0). Theory and practice in translation as applied to Japanese and English literary and non-literary texts. Prerequisite: JAPAN 301 or consent of Department.

**O JAPAN 432 Premodern Japan's Hidden Histories**

★3 (fi 6) (either term, 0-3s-0). Stories and images of under-represented people and categories in premodern Japan, and how dominant cultural images have come to replace the more complex realities of human societies. Prerequisites: One of HIST 280, HIST 381, HIST 382, JAPAN 240 or JAPAN 242, or consent of the department.

**O JAPAN 439 Practical Translation**

★3 (fi 6) (either term, 3-0-0). The practice of translation in media, government, and business. Prerequisite: JAPAN 429 or consent of Department.

**O JAPAN 460 Topics in Japanese Studies**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★6 of senior courses in Japanese or consent of Department. May be repeated for credit when course content differs. Not open to web registration.

**O JAPAN 481 Supervised Reading in Japanese**

★3 (fi 6) (either term, 3-0-0). Accelerated reading course primarily for senior and graduate students in special areas of need or interest. Prerequisite: consent of Department.

**JAPAN 490 Honors Thesis**

★3 (fi 6) (either term, 3-0-0).

## Graduate Courses

**JAPAN 500 Topics in Japanese Language**

★3 (fi 6) (either term, 3-0-0). A reading knowledge of Japanese is required. May be repeated for credit when course content differs.

**JAPAN 502 Methods of Research**

★3 (*fi 6*) (either term, 3-0-0). Theory and practice of historical and critical approaches to premodern and modern Japanese literature. A reading knowledge of Japanese is required.

**JAPAN 503 Colloquia in Japanese Language Research**

★1 (*fi 2*) (either term, 0-1s-0). Seminars on research in Japanese language. Prerequisites: advanced knowledge of Japanese is required and consent of the Department. May be repeated when course content differs. Not open to web registration.

**JAPAN 510 Japanese for Business I**

★3 (*fi 6*) (either term, 3-0-0). An introduction to the Japanese language through Japanese business culture. Primarily for graduate students in the MBA program. Prerequisite: Consent of Department.

**JAPAN 525 Japanese Linguistics**

★3 (*fi 6*) (either term, 3-0-0). Discussion of the major linguistics features of the Japanese language. Lectures in English. Prerequisite: advanced knowledge of Japanese language, a prior linguistics course required, and consent of Department.

**JAPAN 527 Practical Japanese Linguistics**

★3 (*fi 6*) (either term, 3-0-0). Students will develop advanced-level practical linguistics knowledge for effective learning of Japanese as a second language. Prerequisite: advanced knowledge of Japanese and consent of department.

**JAPAN 557 Japanese Women Writers: Theory and Criticism**

★3 (*fi 6*) (either term, 3-0-0). A reading knowledge of Japanese is required.

**JAPAN 598 Topics in Pre-Modern Japanese Literature**

★3 (*fi 6*) (either term, 3-0-0). Graduate students specializing in pre-modern Japanese literature must take JAPAN 598 at least once. May be repeated for credit when course content differs. A reading knowledge of Classical Japanese is required.

**231.167 Korean, KOREA**

Department of East Asian Studies  
Faculty of Arts

**Notes**

- (1) The Department reserves the right to place students in the language course appropriate to their level of language skill.
- (2) Placement tests may be administered in order to assess prior background. Students with an Asian (Chinese, Japanese, Korean) language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in a more advanced course suitable to their level of ability or they may be encouraged to seek "Credit by Special Assessment" (see \$44.5) when appropriate.
- (3) The Department will withhold credit from students completing courses for which prior background is deemed to make them ineligible. For example, 100-level courses are normally restricted to students with little or no prior knowledge in that language. Should a student with matriculation standing, or those possessing prior background (such as native speakers or those for whom it is their first language) register in the 100-level courses, credit may be withheld.

**Undergraduate Courses****KOREA 101 Introductory Korean I**

★3 (*fi 6*) (first term, 3-0-2). Designed to develop basic skills in spoken and written Korean. Note: Only one of KOREA 101 and 121 may be taken for credit.

**KOREA 102 Introductory Korean II**

★3 (*fi 6*) (second term, 3-0-2). A continuation of KOREA 101. Prerequisite: KOREA 101 or equivalent. Note: Only one of KOREA 102 and 122 may be taken for credit.

**KOREA 201 Intermediate Korean I**

★3 (*fi 6*) (first term, 3-0-2). A course designed to improve reading, speaking and writing. Prerequisite: KOREA 102, 122, or equivalent.

**KOREA 202 Intermediate Korean II**

★3 (*fi 6*) (second term, 3-0-2). A continuation of KOREA 201. Prerequisite: KOREA 201, or equivalent.

**KOREA 240 Korean Literature and the Arts**

★3 (*fi 6*) (either term, 3-0-0). A survey of pre-modern and modern literature and art forms in Korea. Taught in English. Note: Does not fulfill any Faculty of Arts requirement for a Language other than English.

**KOREA 301 Intermediate Korean III**

★3 (*fi 6*) (first term, 3-0-2). A course designed to enhance communication, comprehension, and composition through various reading materials and activities. Some Sino-Korean characters (Hahnja) will also be studied. Prerequisite: KOREA 202, or equivalent.

**KOREA 302 Intermediate Korean IV**

★3 (*fi 6*) (second term, 3-0-2). A continuation of Korea 301. Prerequisite: KOREA 301, or equivalent.

**231.168 Laboratory Medicine and Pathology, LABMP**

Department of Laboratory Medicine and Pathology  
Faculty of Medicine and Dentistry

**Undergraduate Courses****LABMP 400 Introduction to Human Disease**

★3 (*fi 6*) (either term, 3-0-0). Lecture sessions on the study of human disease are presented. The causes and general mechanisms of disease with selected specific examples from various organ systems are discussed. Disease related structural and functional changes at the molecular, cellular and tissue level are presented, and how these changes can be appreciated by various laboratory methods. The discipline bridges basic science and clinical medicine. Prerequisites: PHYS 1★6, BIOCH ★3. Credit can be obtained in only 1 of LABMP 400 or LABMP 500

**Graduate Courses****LABMP 500 Introduction to Human Disease**

★3 (*fi 6*) (either term, 3-0-0). Lecture sessions on the study of human disease are presented (LABMP 400). The causes and general mechanisms of disease with selected specific examples from various organ systems are discussed. Disease related structural and functional changes at the molecular, cellular and tissue level are presented, and how these changes can be appreciated by various laboratory methods. A written review of scientific literature on a specific topic in Pathology will be required. Prerequisites: Credit may only be obtained in one of LABMP 400 or LABMP 500.

**LABMP 510 Cryobiology I**

★3 (*fi 6*) (first term, 2-1s-0). Physicochemical changes in aqueous solutions at low temperatures and responses of living cells and tissues to those changes. Current theories of damage and protection during freezing and thawing. Prerequisite: consent of Department. This course may not be taken for credit if credit has already been received in PATH 510.

**LABMP 511 Cryobiology II**

★3 (*fi 6*) (second term, 2-1s-0). Freeze-thaw responses of enzyme systems, individual cells and organized tissues. Preservation of spermatozoa, blood and bone marrow cells, embryos and various tissues. Approaches to the cryopreservation of organs and whole organisms. Applications in medicine and agriculture. Prerequisite: consent of Department. This course may not be taken for credit if credit has already been received in PATH 511.

**LABMP 530 Experimental Design and Scientific Communication**

★3 (*fi 6*) (either term, 1-3s-0). This course is designed to develop the skills of graduate students in the areas of critical review of clinical and basic science literature, experimental study design, research ethics, concepts in oral and poster presentations of scientific research, abstract writing for clinical and basic science conferences, as well as how to maximize the scientific conference experience. Active class discussion is a component of each lecture, with group and individual assignments to give practical experiences to each student immediately applicable to their graduate research program. Open to graduate students and clinical residents in the Faculty of Medicine and Dentistry. Students from other faculties may register with consent of the instructors.

**LABMP 535 Practical Tools for Scientific Research**

★3 (*fi 6*) (second term, 0-3s-0). This course utilizes a workshop format designed to develop the skills of graduate students and clinical residents in scientific writing (i.e. literature reviews, manuscripts, grant applications), research budget planning, developing effective collaborations, intellectual property and technology transfer. An overview of the safety requirements WHMIS, radiation safety, and biological hazards) in order to conduct scientific research. Students will learn how to prepare an ethics application for the use of animals and humans in research. Guest speakers from academia, government and industry are featured. Open to graduate students and clinical residents in the Faculty of Medicine and Dentistry. Students from other faculties may register with consent of the instructors.

**LABMP 540 Directed Reading in Laboratory Medicine and Pathology**

★3 (*fi 6*) (either term, 0-3s-0). Reading and study of basic laboratory medicine and pathology topics relevant to the student's chosen field of study under the direction of one or more faculty members. Prerequisite: Consent of Graduate Co-ordinator, Laboratory Medicine and Pathology.

**LABMP 550 Analytical and Environmental Toxicology**

★3 (*fi 6*) (either term, 3-0-0). Principles of and recent advances in analytical and environmental toxicology, fate and behavior of environmental contaminants, sampling and analysis of toxic substances, biomonitoring and biomarkers. Open to graduate students in Laboratory Medicine and Pathology. Students from other departments may register with consent of the instructor.

**LABMP 551 Laboratory Research Methods**

★3 (fi 6) (either term, 2.5-0-0.5). Theory and practice of laboratory research techniques and methods. Fundamentals and applications of quantitative analysis, separation, atomic spectrometry, mass spectrometry, PCR and cloning with laboratory experiments. For students who will perform laboratory research. This course may not be taken for credit if credit has been received in PHS 513. Prerequisite: Consent of the instructor.

**LABMP 581 Techniques in Molecular Biology**

★3 (fi 6) (either term, 1-0-5). A laboratory course emphasizing introductory and advanced techniques in molecular biology (MLSCI 481). Isolation of RNA, Northern blotting, construction of cDNA, amplification of DNA by the polymerase chain reaction, analysis of DNA by restriction digestion, transfection of eukaryotic cells for protein expression and Western blotting analysis. Prerequisites: GENET and BIOCH 200 and BIOCH 330 and consent of the Department. A written review of scientific literature on a topic in molecular biology will be required. This course is designed for graduate students. Credit may only be obtained in one of MLSCI 481 or LABMP 581.

**231.169 Latin, LATIN**

Department of History and Classics  
Faculty of Arts

**Notes**

- (1) Prerequisite for all 400-level Latin courses: LATIN 302, or consent of Department.
- (2) For additional related courses see Classics (CLASS) and Greek (GREEK) listings.

**Undergraduate Courses****L LATIN 101 Beginners' Latin I**

★3 (fi 6) (either term, 3-0-1). Elements of Latin grammar and reading of simple texts. Note: Not to be taken by students with credit in Latin 30 or LATIN 100.

**L LATIN 102 Beginners' Latin II**

★3 (fi 6) (either term, 3-0-1). A continuation of LATIN 101. Students who intend to proceed to LATIN 301 should register in LATIN 104. Prerequisite: LATIN 101 or consent of Department. Not open to students with credit in LATIN 104.

**LATIN 104 Beginners' Latin II (For Further Study)**

★3 (fi 6) (either term, 3-0-1). Continuation of LATIN 101 for those who intend to proceed to LATIN 301. Prerequisite: LATIN 101 or consent of Department. Not open to students with credit in LATIN 102.

**L LATIN 301 Intermediate Latin I**

★3 (fi 6) (either term, 3-0-1). Review of grammar; reading of Latin texts; translation of simple sentences from English into Latin. Prerequisite: LATIN 102 (prior to 2005-06), or 104 or consent of Department.

**L LATIN 302 Intermediate Latin II**

★3 (fi 6) (either term, 3-0-0). Selections from Latin poetry and prose. Prerequisite: LATIN 301 or consent of Department.

**LATIN 401 Latin Syntax and Style**

★3 (fi 6) (either term, 3-0-0). Advanced study of Latin syntax and style both prose and verse, including translation from English into Latin.

**L LATIN 406 Topics in Latin Poetry**

★3 (fi 6) (either term, 3-0-0).

**L LATIN 410 Topics in Latin Prose**

★3 (fi 6) (either term, 3-0-0).

**L LATIN 433 Topics in Medieval Latin**

★3 (fi 6) (either term, 0-3s-0).

**L LATIN 468 Topics in Latin Literature**

★3 (fi 6) (either term, 3-0-0).

**L LATIN 470 Topics in Latin Historiography**

★3 (fi 6) (either term, 3-0-0).

**L LATIN 481 Topics in Latin Epic**

★3 (fi 6) (either term, 3-0-0).

**L LATIN 499 Individual Study in Latin Authors**

★3 (fi 6) (either term, 3-0-0).

**LATIN 500 Fourth-Year Honors Tutorial**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

**Graduate Courses****LATIN 501 Latin Syntax and Style**

★3 (fi 6) (either term, 3-0-0). Advanced study of Latin syntax and style both prose and verse, including translation from English into Latin.

**LATIN 502 Topics in Latin Epic**

★3 (fi 6) (either term, 3-0-0).

**LATIN 506 Topics in Latin Poetry**

★3 (fi 6) (either term, 3-0-0).

**LATIN 508 Topics in Latin Historiography**

★3 (fi 6) (either term, 3-0-0).

**LATIN 510 Topics in Latin Prose**

★3 (fi 6) (either term, 3-0-0).

**LATIN 533 Topics in Medieval Latin**

★3 (fi 6) (either term, 3-0-0).

**LATIN 562 Topics in Latin Literature**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

**LATIN 599 Supervised Reading**

★3 (fi 6) (either term, 3-0-0).

**LATIN 699 Conference Course**

★3 (fi 6) (either term, 3-0-0).

**231.170 Latin American Studies, LA ST**

Department of Modern Languages and Cultural Studies  
Faculty of Arts

**Notes**

- (1) All LA ST courses are taught in English.
- (2) See also listings under Modern Languages and Cultural Studies (MLCS).

**Undergraduate Courses****L LA ST 205 Mexico, Central America and the Caribbean**

★3 (fi 6) (either term, 3-0-0). Regional similarities and national differences. An introduction to Mexico, Central America and the Caribbean today, including, Spanish, French, and Creole speaking countries through study of their cultural contexts and forms of expression.

**L LA ST 210 South America**

★3 (fi 6) (either term, 3-0-0). Regional similarities and national differences. An introduction to South America today, including Brazil and the Spanish speaking countries of the continent, through study of their cultural contexts and forms of expression.

**O LA ST 310 Latin America at the Movies**

★3 (fi 6) (either term, 3-0-3). The representation of Latin American people, places and events in the cinemas of Latin America, North America and Europe. Prerequisite: LA ST 205 or 210 or consent of Department.

**O LA ST 311 Latin America and the Cultures of Popular Music**

★3 (fi 6) (either term, 3-0-0). Popular music and its role in the formation of regional and national identities, with a focus on concepts such as high and low cultures, mass culture and mass media, cultural hybridity, diaspora, and creativity. Prerequisite: LA ST 205 or 210 or consent of Department. Note: not to be taken by students with credit in MUSIC 311.

**O LA ST 313 Women in Latin America**

★3 (fi 6) (either term, 3-0-0). Women as creators, consumers, transformers, and guardians of culture. Forms of female representation through stereotypes, clichés, archetypes, and mythologies. Prerequisite: LA ST 205 or 210 or consent of Department.

**L LA ST 314 Urban Space and Visual Culture**

★3 (fi 6) (either term, 3-0-0). The representation of urban space in art, architecture, film and other media. Prerequisite: LA ST 205 or 210 or consent of the Department.

**LATIN 320 Amerindian Cultures**

★3 (fi 6) (either term, 3-0-0). Cultural and intellectual productions of pre-Columbian cultures in Latin America through a variety of media. Prerequisite: LA ST 205 or 210 or consent of the Department.

**LATIN 321 Religions in Latin America**

★3 (fi 6) (either term, 3-0-0). Prerequisite: LA ST 205 or 210 or consent of the Department.

**L LA ST 330 The Latino Experience Abroad**

★3 (fi 6) (either term, 3-0-0). Exile, immigration, identity, language, and other questions in texts from Latin American and Caribbean communities in North America. Note: not to be taken by students with credit in SPAN 330.

**O LA ST 360 Latin America in its Literature (in English Translation)**

★3 (fi 6) (either term, 3-0-0). Relations among the literature, culture, history, and politics of Latin America through a selection of texts originally written in Spanish, Portuguese and/or an indigenous language. Prerequisite: ★3 in any senior literature course, or consent of Department. Note: not to be taken by students with credit in SPAN 360 or C LIT 363.



**0 LA ST 399 Topics in Latin American Studies**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: LA ST 205 or 210 or consent of Department.

**LA ST 411 Culture, Race and Ethnicity in Latin America**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★3 in LA ST courses at the 300-level or consent of Department.

**LA ST 412 Latin America in Focus**

★3 (*fi 6*) (either term, 3-0-0). Study of a particular region, country, or city. Prerequisite: ★3 in LA ST courses at the 300-level or consent of Department.

**LA ST 413 Gendering Latin America**

★3 (*fi 6*) (either term, 3-0-0). Through gender and queer theory, a discussion of sex and sexualities in literature, film and visual arts. Prerequisite: ★3 in LA ST at the 300-level or consent of Department.

**LA ST 414 Travel Writing**

★3 (*fi 6*) (either term, 0-3s-0). Through a variety of cultural and textual productions, students will explore how various Latin American and foreign travellers construct a vision of Latin America. Prerequisite: ★3 in LA ST courses at the 300-level or consent of Department.

**LA ST 415 From Modernism to Tropicalism: (Post) Modernity in Brazilian Culture**

★3 (*fi 6*) (either term, 3-0-0). Survey of Brazilian cultural development from the historical modernist vanguard of 1922 to the Tropicalist movement of the 1960s. Prerequisite: ★3 in LA ST courses at the 300-level or consent of Department.

**LA ST 420 Jewish Cultural Production in Latin America**

★3 (*fi 6*) (either term, 3-0-0). Jewish texts in Latin America with a focus on literature. Prerequisite: ★3 in LA ST courses at the 300-level, or consent of Department.

**LA ST 425 Latin American Film Genres**

★3 (*fi 6*) (either term, 3-0-0). Detailed study of a film genre and the representative Latin American films of such genre. Prerequisite: ★3 in LA ST courses at the 300-level, or consent of Department.

**LA ST 499 Special Topics**

★3 (*fi 6*) (either term, 3-0-0).

## 231.171 Law, LAW

Faculty of Law

### Undergraduate Courses

**LAW 399 Introduction to Environmental Law**

★3 (*fi 6*) (second term, 3-0-0). Introduces students to the basic structure and function of the legal system. It will then focus on the way in which law is used to control environmental problems, focussing on major federal and provincial pollution licensing legislation, and the legal duties of persons working within industry. Regimes for environmental impact assessment and the use of criminal and civil enforcement mechanisms will also be included. The relationship between legal rules and non-legal industry standards and voluntary initiatives may also be explored. Note: Open to students in the Civil Engineering (Environmental Option) degree program only. This course may not be taken for credit if credit has already been obtained for LAW 459.

**LAW 401 Foundations to Law**

★3 (*fi 6*) (first term, 3-0-0). An introduction to the institutions and processes of the Canadian legal system, and its underlying values and systems of thought. Also introduced are the history, structure and function of the modern system, and the role of law and the legal profession in society.

**LAW 405 Legal Research and Writing**

★4 (*fi 8*) (two term, 2-0-0). Instruction in the fundamentals of legal research tools and techniques, including the impact of modern technology. Through a variety of written assignments, students will develop their analytical, research, communication and drafting skills, as well as becoming familiar with proper citation methods. Exercises in oral communications, advocacy skills and/or a moot court presentation may also be included.

**LAW 410 Contracts**

★5 (*fi 10*) (two term, 2-0-0; 3-0-0). A discussion of the prerequisites to the creation of contractual obligation: offer and acceptance, intention and certainty, consideration, the requirements of writing and capacity. The effect of misrepresentations and terms of the contract, together with the problems of exclusion clauses and of standard form contracts. Questions of discharge from contractual obligation on the grounds of mistake, undue influence, duress, unconscionable transactions and frustration. Remedies for breach of contract.

**LAW 420 Criminal Law**

★5 (*fi 10*) (two term, 2-0-0; 3-0-0). A general introduction to the criminal law, including basic procedure, evidence, and sentencing rules, with primary emphasis

on substantive criminal law. Topics include the physical and fault elements of offences, common law and statutory defences, and constitutional principles.

**LAW 430 Torts**

★5 (*fi 10*) (two term, 2-0-0; 3-0-0). The law of negligence, damages, intentional interferences with persons, property and chattels, the law of strict liability, occupiers' liability, nuisance, defamation, the economic torts, the future of tort law.

**LAW 435 Constitutional Law**

★5 (*fi 10*) (two term, 2-0-0; 3-0-0). An introduction to the legal framework governing the exercise of power by the legislative, executive and judicial branches of the Canadian state, covering who has the power to make new laws, the power to implement laws, and the power to adjudicate disputes. The limitations imposed on these powers by the rules of federalism and by the provisions of the Canadian Charter of Rights and Freedoms are also considered. An introduction to the constitutional provisions concerning Canada's Aboriginal peoples is also included.

**LAW 440 Property Law**

★5 (*fi 10*) (two term, 2-0-0; 3-0-0). This course involves the study of basic principles which govern the institution of real and personal property. Included in this analysis will be the history of property law and issues of social and political context. Other topics include right incident to the ownership and possession of land, tenures and estates, concurrent ownership, dower, leases and tenancies, easements, restrictive covenants, finders law, bailment, and gifts. Other special issues may be explored.

**LAW 450 Administrative Law**

★3 (*fi 6*) (either term, 3-0-0). Designed to provide an understanding of the legal constraints courts have placed on the behavior of administrative tribunals and government departments. Topics to be discussed: What is Administrative Law? How the courts supervise the acts and decisions of administrative bodies. Pitfalls to be avoided by administrative officers: errors of fact and law; excesses of discretion; breach of natural justice. How administrative acts and decisions may be attacked by an aggrieved citizen: remedies. Appeal and review, time limits, locus standi, choice of remedy, procedure. How to avoid attacks by aggrieved citizens. The practical outcome; strength of review. Recent trends in Administrative Law in Canada.

**LAW 451 Corporations Law**

★3 (*fi 6*) (either term, 3-0-0). The laws governing corporations including: pre-incorporation matters; the corporation as a legal person; the tortious, criminal, regulatory, and contractual liability of the corporation; corporate social responsibility; corporate management; shareholder rights; and shareholder remedies. May not be taken for credit if credit has already been obtained for LAW 510.

**LAW 452 Civil Procedure**

★3 (*fi 6*) (either term, 3-0-0). The fundamentals of the traditional litigation process (under the Rules of Court and applicable statutes) and current issues including access and reform. May not be taken for credit if credit has already been obtained for LAW 570.

**LAW 453 Evidence**

★3 (*fi 6*) (either term, 3-0-0). The principles, rules, and procedures governing the admissibility of evidence in criminal and civil trials. Topics include competence and compellability, relevance, prejudicial effect and probative value, and character, hearsay, and expert evidence.

**LAW 454 Conflict of Laws**

★3 (*fi 6*) (either term, 3-0-0). Theoretical basis of conflict of laws. Preliminary topics: characterization, renvoi, time element domicile. Choice of Law: domestic relations, contract, torts. Jurisdiction and the recognition of foreign judgments. May not be taken for credit if credit has already been obtained for LAW 600.

**LAW 456 Professional Responsibility**

★3 (*fi 6*) (either term, 3-0-0). A consideration of the responsibilities of the lawyer to the profession and the profession to the public. Ethics and organization of the profession. Course may not be taken for credit if credit has already been obtained for LAW 670.

**LAW 486 Jurisprudence**

★3 (*fi 6*) (either term, 3-0-0). An enquiry into the nature of law and legal obligation. The first part of the course is a survey of the major schools of jurisprudence with particular emphasis upon positivism, natural law and legal realism. The second part consists of an examination of the modern applications of these theories, especially in relation to the process of judicial decision making and the question of whether there is an obligation to obey the law. May not be taken for credit if credit has already been obtained for LAW 500.

**LAW 496 Legal History**

★3 (*fi 6*) (either term, 3-0-0). An introduction to the historical development of law, from early times to the present day. May not be taken for credit if credit has already been obtained for LAW 505.

**LAW 501 Biotechnology Policy**

★3 (*fi 6*) (either term, 3-0-0). An exploration of the policy challenges associated with emerging biotechnology innovations, including stem cell research, human

cloning, gene patents and bio-banking. While the course will cover relevant national and international law, its emphasis will be on ethical and policy issues. Credit will not be granted if credit has been received for Biotechnology under the LAW 599 course number.

#### **LAW 502 Construction Law**

★3 (*fi 6*) (either term, 3-0-0). An introduction to construction law, concerning issues such as tendering, contractual relationships between various parties to the construction process, construction delivery systems, standard form agreements, bonding and insurance, the impact of tort law on construction activities, builder's lien law, occupational health and safety law, and environmental law relating to construction. Credit will not be granted if credit has been received for Construction Law under the LAW 599 course number.

#### **LAW 503 Employment Law**

★3 (*fi 6*) (either term, 3-0-0). An exploration of theoretical and legal issues bearing on employment outside the unionized/collective-bargaining context, including employment as a legal relationship, independent contractors, dismissal with and without just cause, damages, and the impact of key statutes. Emerging issues shall be explored, such as the protection of confidential information, the duty of good faith, discrimination, and post-employment obligations. This course complements the Labour Law course. Credit will not be granted if credit has been received for Employment Law under the LAW 599 course number.

#### **LAW 504 Taxation**

★3 (*fi 6*) (either term, 3-0-0). The scope and purpose of taxation. The taxing power; tax appeal procedures; constitutional problem. Personal jurisdiction. Property jurisdiction. Income from a business; capital gains and losses; statutory interpretation, deductions, expenses. Gift tax. May not be taken for credit if credit has already been obtained for LAW 460.

#### **LAW 506 Public International Law**

★3 (*fi 6*) (either term, 3-0-0). A survey of the foundational principles, structure and institutions of public international law, including the nature of the international legal system, the sources of international law, and the relevance of international law to the Canadian legal system. The role of international organizations, such as the United Nations, will also be discussed.

#### **LAW 507 Canadian Human Rights Law**

★3 (*fi 6*) (either term, 3-0-0). This course focuses on the practice of human rights law in Canada. The importance of anti-discrimination legislation will be discussed, as will the development, interpretation, and enforcement of the Canadian Human Rights Act and the provincial legislative schemes. Reference will also be made to the international context and to the equality provisions of the Canadian Charter of Rights and Freedoms. Students will also learn the practical aspects of litigating a human rights case in Canada. Credit will not be granted if credit has been received for Human Rights Law in Canada under the LAW 599 course number.

#### **LAW 508 Legislative Process and Legislative Drafting**

★3 (*fi 6*) (either term, 3-0-0). This course provides students with a comprehensive introduction to the drafting, passage and interpretation of legislation. The course will deal first with Assemblies consideration of legislation, parliamentary powers, parliamentary privilege, and constitutional limitations on legislatures. Second, it will introduce judicial techniques for interpreting legislation. Third, students will be taught the basics of legislative drafting and the structure of legislation with particular emphasis on Alberta practices and Canadian drafting conventions. Credit will not be granted if credit has been received for Legislative Process and Legislative Drafting under the LAW 599 course number.

#### **LAW 509 Mediation Advocacy**

★3 (*fi 6*) (either term, 3-0-0). Mediation is a problem-solving process requiring approaches differing from those used in traditional litigation. This course teaches the mediation process from the advocate's perspective and provides an opportunity to practice the skills necessary to become an effective mediation advocate. Credit will not be granted if credit has been received for Mediation Advocacy under the LAW 599 course number.

#### **LAW 511 Remedies**

★3 (*fi 6*) (either term, 3-0-0). This course focuses on remedies in a commercial setting, regardless of which 'compartment' of law with which they are typically associated. The course will explore issues related to traditional contract remedies, contract-tort overlap, and equitable remedies. It will also consider some of the problems associated with personal injury claims including quantification issues and the role of insurance. Credit will not be granted if credit has been received for Remedies under the LAW 599 course number.

#### **LAW 512 Techniques in Negotiation**

★3 (*fi 6*) (either term, 3-0-0). An in-depth analysis of the nature, purpose, and methodology of negotiation. Mock negotiations will be undertaken by the class. Mediation and arbitration will be discussed. May not be taken for credit if credit has already been obtained for LAW 472.

#### **LAW 514 Judgment Enforcement Law**

★3 (*fi 6*) (either term, 3-0-0). The law governing the enforcement of judgments by unsecured creditors. Will provide an in-depth analysis of the Civil Enforcement Act of Alberta. Topics include prejudgment remedies, registration and priority of writs,

enforcement against personal property, enforcement against land, garnishment and distribution. Will also cover fraudulent conveyances and preferences.

#### **LAW 515 Sale of Goods**

★3 (*fi 6*) (either term, 3-0-0). The law of the sale of goods; nature of contract of sale, conditions and warranties implied by the Sale of Goods Act, passing of property and risk, documentary sales transactions, remedies of the buyer and the seller, circumstances under which a seller can pass a better title than he/she has. A portion of the course will be devoted to a discussion of consumer protection legislation.

#### **LAW 516 Dispute Resolution**

★3 (*fi 6*) (either term, 3-0-0). This course will provide students with an understanding of the breadth and scope of dispute resolution alternatives with a focus on how those alternative processes are being utilized in Alberta. Students will learn various forms of dispute resolution including client interviewing, negotiation, mediation, arbitration, med-arb, the mini-trial and litigation risk analysis. Course will look at how dispute resolution fits within the adversarial system, the benefits and drawbacks of each process and how to choose the most appropriate form.

#### **LAW 518 Intellectual Property**

★3 (*fi 6*) (either term, 3-0-0). A study of the law with respect to patents, trade marks, trade secrets, copyrights and intangible property generally.

#### **LAW 519 Insurance Law**

★3 (*fi 6*) (either term, 3-0-0). General principles affecting insurance contracts including good faith, indemnity, subrogation, and insurable interest; particular problems arising out of the Alberta Insurance Act in relation to automobile, life and fire insurance.

#### **LAW 520 Criminal Procedure**

★3 (*fi 6*) (either term, 3-0-0). An overview of the entire criminal process, from the investigatory stage to the laying of charges through to appeals. The primary emphasis will be on the pre-adjudicative phase of criminal matters, particularly the authority of the police to detain, search/seize, question and arrest individuals.

#### **LAW 522 Sentencing**

★3 (*fi 6*) (either term, 3-0-0). An introduction to and survey of the law of sentencing. Topics include the history of punishment, the philosophical underpinnings of sentencing law, the evidentiary rules governing sentencing hearings, and the substantive principles of adult and young offender sentencing.

#### **LAW 524 Family Law**

★3 (*fi 6*) (either term, 3-0-0). The formation and annulment of marriage; various matrimonial remedies; judicial separation; alimony; loss of consortium; divorce; ground and procedure; custody of children; financial obligations and property rights between spouses. May not be taken for credit if credit has already been obtained for LAW 485.

#### **LAW 526 Independent Research Paper**

★3 (*fi 6*) (either term, 3-0-0). Selected students are afforded the opportunity to undertake an independent research project on an approved topic under the direct supervision of a full-time Faculty member resulting in the submission of a research paper of 8,000 to 10,000 words. In addition to advanced knowledge; the course is designed to enhance problem solving skills, legal research methodologies and techniques and legal writing and communication skills. Material submitted for assessment in another course cannot be used in an independent research project.

#### **LAW 531 Law and Medicine**

★3 (*fi 6*) (either term, 3-0-0). Selected topics pertinent to law and medicine with an emphasis on the practical implications of the law for the medical profession and the effect of changes in medical practice and institutions on the law. Problems will be examined with assistance from professionals working in the relevant areas and recommendations for law reform will be sought.

#### **LAW 532 Constitutional Litigation**

★3 (*fi 6*) (either term, 3-0-0). Will address current issues in constitutional litigation particularly those involving the Charter. The emphasis will be on both substantive knowledge of constitutional litigation issues and development of skills within that framework. Issues such as pleadings, interventions and class actions, examination of lay and expert witnesses, the use of extrinsic aids, statistical and other forms of ordinary and expert evidence, forms of remedies, form and role of written briefs, and other related matters will be addressed. May not be taken for credit if credit has already been obtained for LAW 639.

#### **LAW 533 Advanced Problems in Constitutional Law**

★3 (*fi 6*) (either term, 3-0-0). Entails an examination of various current problems in constitutional law. Topics covered in past years include Criminal Justice and the Charter, Comparative Constitutional Law, and Federal/Provincial Law. May not be taken for credit if credit has already been obtained for LAW 637.

#### **LAW 536 Civil Liberties**

★3 (*fi 6*) (either term, 3-0-0). An in-depth analysis and discussion of the Charter of Rights and Freedoms and the cases decided thereunder; the role of the judiciary and the legitimacy and scope of judicial review under the Charter; the protection afforded under the Constitution Act, 1867 (e.g. implied Bill of Rights,

provisions regarding denominational guarantees), Canadian Bill of Rights, 1960, anti-discrimination laws (e.g. Canadian Human Rights Act, Individual Rights Protection Act), the Office of the Ombudsman, Freedom of Information legislation. All or some of the above will be discussed. Comparative materials will be studied where appropriate.

#### **LAW 538 Alberta Law Review**

★3 (*fi 6*) (either term, 3-0-0). Students enrolled in this course will be involved in all facets of the production of the Alberta Law Review, including the assessment, selection and substantive and stylistic editing of manuscripts submitted for publication. Students enrolled in this course must normally participate as a member of the Law Review for two academic years to be eligible for credit. Students may be admitted only on application. May not be taken for credit if credit has already been obtained for LAW 650.

#### **LAW 540 Land Titles**

★3 (*fi 6*) (either term, 3-0-0). A detailed study of the Alberta Land Titles Act consisting of an analysis of the Common Law and Registry Systems of Conveyancing; Introduction to the Torrens System of Land Titles; The Principles of Indefeasibility; Exceptions to Indefeasibility; Boundary Problems; Caveats; Registrable Instruments; Miscellaneous Title Problems; Remedies and Limitations; Reform.

#### **LAW 542 Alberta Law Review Research Paper**

★3 (*fi 6*) (either term, 3-0-0). This course provides members of the Alberta Law Review with an opportunity to engage in original research and to prepare a paper of publishable quality. The research topic is subject to the prior approval of the Faculty Advisor and the Assistant or Associate Dean. The paper must be presented at a seminar of Law Review members. May not be taken for credit if credit has already been obtained for LAW 655.

#### **LAW 543 Basic Oil and Gas Law**

★3 (*fi 6*) (either term, 3-0-0). The origin, occurrence, and production of oil and gas; the nature of interests in oil and gas; the acquisition and disposition of interests in oil and gas; the rights and duties of parties under oil and gas leases; pooling of oil and gas interests; acquisition of surface leases and pipeline easements.

#### **LAW 545 The Law of Fiduciary Obligation**

★3 (*fi 6*) (either term, 3-0-0). Fiduciary law regulates relationships which depend, for their efficacy, on a strict duty of loyalty. Fiduciaries have protective responsibility for the interests, both economic and non-economic, of other persons, usually "vulnerable" persons. Fiduciary law regulates diverse relationships, including relationships between joint venturers, business partners, directors and senior management and corporations, senior employees and employers, professional service providers, lawyers, doctors, accountants, therapists and their clients and patients, principals and agents, the Crown and Indigenous Peoples and parents and their children. Topics covered will include the nature of fiduciary relationships, obligations of fiduciaries, including the obligation to avoid conflict of interest and remedies for breach of fiduciary obligation. Some attention will be paid to "unexpected" fiduciary relationships and the interrelation between fiduciary law and other sources of liability.

#### **LAW 546 Interviewing and Counselling**

★3 (*fi 6*) (either term, 3-0-0). The purpose of this course is to assist students in developing skills in the interviewing and counselling process. The course attempts to introduce and develop models for interviewing and counselling. The principal model is one that stresses a client-centred approach.

#### **LAW 547 Entertainment Law**

★3 (*fi 6*) (either term, 3-0-0). This course examines the law which regulates the entertainment industry, including the music and recording industry, television, radio, motion pictures, written publications, sports agency, satellite and advanced communication and the internet.

#### **LAW 548 Alberta Human Rights and Citizenship Commission Practicum**

★3 (*fi 6*) (either term, 3-0-0). This course provides an opportunity for a small group of students to gain experience in the areas of human rights and citizenship through research, writing and advocacy. Students will provide assistance to otherwise unrepresented complainants in respect of quasi-judicial proceedings conducted under the Human Rights, Citizenship and Multicultural Act.

#### **LAW 552 Natural Resources Law**

★3 (*fi 6*) (either term, 3-0-0). The judicial, legislative, administrative and policy problems related to the regulation and management of natural resources, including problems of allocation, development, use, pollution control, and conservation.

#### **LAW 555 Labor Law**

★3 (*fi 6*) (either term, 3-0-0). Legal problems concerning the establishment of collective bargaining; negotiation and enforcement of the collective agreement; the activities of unions and employers in industrial disputes; and the internal affairs of labor organizations.

#### **LAW 556 Labor Arbitration**

★3 (*fi 6*) (either term, 3-0-0). The law and practice relating to interest and rights arbitrations in Alberta. The course will be taught partly as a seminar and partly through a series of mock arbitrations in which students will act as counsel.

#### **LAW 557 International Human Rights Law**

★3 (*fi 6*) (either term, 3-0-0). This seminar focuses on U.N. human rights law

(political, civil, economic, social and cultural rights), rights of women, children's rights, regional human rights systems, Canadian implementation of international human rights obligations, national human rights institutions, transitional justice issues, interface with international humanitarian law, and student research presentations.

#### **LAW 558 Poverty Law**

★3 (*fi 6*) (either term, 3-0-0). The culture of poverty and its implications for anti-poverty planning will be examined with emphasis on psychological, sociological and economic theory. Organizational models for the delivery of legal services will be considered together with a treatment of the theory of equality, the problem of accessibility to the claims process and alternative methods of dispute settlement. The character of the law concerning the poor will be analyzed as reflected in selected case studies in welfare law, public housing policy, workmen's compensation and unemployment insurance.

#### **LAW 559 Environmental Law and Policy**

★3 (*fi 6*) (either term, 3-0-0). Canadian laws and policies designed to control air, land, and water pollution, including licensing systems, the use of quasi-criminal sanctions, environmental impact assessment processes, constitutional issues, and the usefulness of the common law. Other topics may include alternative legal approaches, such as economic incentives, wildlife protection, environmental rights, parks, the public trust doctrine or environmental mediation.

#### **LAW 561 International Criminal Law**

★3 (*fi 6*) (either term, 3-0-0). An introduction to the international legal framework for the prosecution of international crimes and crimes of international concern, and the examination of the international community's response to these crimes through the creation of international and internationalized criminal tribunals, including the International Criminal Court. Topics for further examination include immunities, amnesties, and sentencing, as well as the domestic prosecution of international crimes in Canada and other forms of Canadian cooperation.

#### **LAW 565 International Business Transactions**

★3 (*fi 6*) (either term, 3-0-0). This is a survey course on the international and domestic law governing the transactional aspects of international trade/investment activities of Canadian and foreign business entities. Topics covered include contract types and drafting, international sale of goods, financing of transactions, dispute settlement by international commercial arbitration, export/import laws, human rights and MNCs, anti-bribery laws, and international investment law.

#### **LAW 567 Pacific Rim Law**

★3 (*fi 6*) (either term, 3-0-0). This course will give students the opportunity to understand the Japanese, their society and their law in the context of international society. The exact contents of the course will depend on the speciality area of the visiting professor.

#### **LAW 578 Family at Risk**

★3 (*fi 6*) (either term, 3-0-0). Focuses on the human dimension behind family law. A panorama of subjects will be discussed which may include new family structures, adoption, troubled children, young offenders, and the causes and effects of marriage breakdown. This course may not be taken for credit if credit has already been obtained for LAW 687.

#### **LAW 580 Trusts**

★3 (*fi 6*) (either term, 3-0-0). A brief survey of the historical development of the trust. Definition and classification of trusts. Creation of express trust; the three certainties. Completely and incompletely constituted trusts. Secret, protective, discretionary and illusory trusts. Charitable trust and the rule against perpetuities. Cy-pres doctrine. Non-charitable purpose trusts. Implied or resulting trusts. Constructive trusts. Revocation, termination and variation of trusts. The appointment, retirement and removal of trustees. Duties, discretion and powers of trustees. Breach of trust.

#### **LAW 582 Wills and Administration**

★3 (*fi 6*) (either term, 3-0-0). Principles of the Wills Act, including formalities of execution, revocation, revival, republication, types of legacies, and principles of construction. Testamentary capacity, fraud, and undue influence. Drafting of wills. Appointment of executors and administrators, their powers and duties; probate practice.

#### **LAW 584 Bankruptcy and Insolvency**

★3 (*fi 6*) (either term, 3-0-0). Participants will acquire an understanding of the rules, principles and policies underlying modern bankruptcy and insolvency law. The principal focus of the course is on the federal Bankruptcy and Insolvency Act. Topics include the invocation of bankruptcy, the vesting of property in the trustee in bankruptcy, the effect of bankruptcy on third parties, impugning pre-bankruptcy transactions, the scheme of distribution, and bankruptcy discharge. The course will also examine reorganizations under the federal Companies' Creditors Arrangement Act, and review the foundational features of receivership law.

#### **LAW 587 Personal Property Security Law**

★3 (*fi 6*) (either term, 3-0-0). The course will provide an in-depth analysis of the law of secured transactions in personal property. The salient features of the Alberta Personal Property Security Act will be examined, including topics on the scope of the Act, security agreements, the concepts of attachment and



perfection, the priority of security interests in relation to other interests, proceeds and enforcement of security interests. Course may not be taken for credit if credit has already been obtained for LAW 614.

#### **LAW 588 Immigration Law**

★3 (fi 6) (either term, 3-0-0). An in-depth analysis of Immigration Law in Canada. Will review the Immigration Act and Regulations and look at various tribunals involved in the immigration process including the Immigration and Refugee Board and the Federal Court. Will provide a brief historical review and discuss new developments in the law and important policy areas.

#### **LAW 590 Aboriginal Peoples and the Law**

★3 (fi 6) (either term, 3-0-0). This is a survey course on Aboriginal Peoples in Canadian Law. Subjects covered include issues of race and legal reasoning, legal and historical foundations of claims to Aboriginal rights, treaty rights, Métis rights, Aboriginal peoples and the Constitution, Aboriginal claims negotiation and litigation, the Indian Act, and contemporary legal and political developments including an introduction to Aboriginal government. The course is organized as a seminar in which a great deal of learning arises from discussion and class participation.

#### **LAW 592 Advanced Criminal Law**

★3 (fi 6) (either term, 3-0-0). The course comprises an examination of substantive criminal law particularly: offences against the person and rights of property; the jury system; juvenile justice and quasi-criminal proceedings; and, the extraordinary remedies. May not be taken for credit if credit has already been obtained for LAW 620.

#### **LAW 593 International Environmental Law**

★3 (fi 6) (either term, 3-0-0). The development of international law in the environmental area. Topics to be covered include: customary principles of state responsibility; multilateral environmental treaties; global atmospheric issues; toxic contamination; sustainable development; biodiversity conservation; and international trade implications. It is recommended, but not required, that students enrolled in this course take Public International Law.

#### **LAW 596 Advanced Torts**

★3 (fi 6) (either term, 3-0-0). An analysis of, and problems in, the Law of Torts.

#### **LAW 598 Moot Court Competition**

★3 (fi 6) (either term, 3-0-0). Selection to the Gale Cup, Jessup Moot, Laskin Moot, Kawaskimhon Aboriginal Moot, Western Canada/Sopinka Trial Cup Trial Moot, Canadian Corporate/Securities Moot, Labour Arbitration Moot, Alberta Court of Appeal Moot, Client Counselling Competition, Clinton J. Ford Moot, or other designated moot competition team through a preliminary round competition, preparation of a memorandum, factum or memorial, training in oral advocacy or criminal trial practice through practice rounds, and participation as a representative of the law school at the moot court competition.

#### **LAW 599 Seminars on Specialized Legal Topics**

★3 (fi 6) (either term, 0-3s-0). These seminars will cover specialized topics of emerging importance in the law at a senior level. The particular topic covered would vary dependent on the availability of Faculty with necessary teaching competence, student interest, and the needs of the legal profession. Sections may be offered in a Cost Recovery format at an increased rate of fee assessment; refer to the Fees Payment Guide in the University Regulations and Information for Students

#### **LAW 601 Corporate Reorganization and Restructuring**

★3 (fi 6) (either term, 3-0-0). Corporate reorganization and restructuring law defines a process through which an insolvent corporation attempts to reach an arrangement or proposal with its creditors. Students will acquire an understanding of the fundamental rules and principles of corporate reorganization and insolvency law within the context of a legal skills-training simulation that will also develop their ability to advise clients, negotiate with other lawyers and present arguments before a judge. Prerequisite: LAW 584. Credit will not be granted if credit has been received for Corporate Reorganization under the LAW 599 course number.

#### **LAW 602 Family Law Practice Issues**

★3 (fi 6) (either term, 3-0-0). An introduction to family law practice. The course will address all aspects of family files, including chambers advocacy, preparation and presentation of affidavits, special chambers briefs, JDR's, mini-trials, Examinations for Discovery and Examinations on Affidavit, pre-trial conferences, and trials. The course will also explore the use of other professionals in family matters, including accountants, valuers and psychologists. Practice issues covered include the special challenges of interviewing, managing client expectations, reading financial statements, and handling stress in family practice. Collaborative law practice as an alternative to litigation will be introduced. Students will moot a full special Chambers application. Prerequisite: LAW 524. Credit will not be granted if credit has been received for the Family Law Practicum under the LAW 599 course number.

#### **LAW 603 International Taxation**

★3 (fi 6) (either term, 3-0-0). A study of residence and non-residence for tax purposes, the taxation of non-residents who earn income in Canada, the taxation of Canadian residents who earn income outside Canada, and the interpretation and application of Canada's bilateral tax treaties. Prerequisite: LAW 504. Credit will not be granted if credit has been received for International Taxation under the LAW 599 course number.

#### **LAW 608 Advocacy**

★3 (fi 6) (either term, 3-0-0). The conduct of civil litigation including: interviewing and counselling, drafting pleadings, examinations for discovery, settlement attempts, preparation for court and participation in a mock trial. Emphasis on ethics and techniques of persuasion. Prerequisites: Completion of LAW 453.

#### **LAW 613 Corporate Securities and Finance**

★3 (fi 6) (either term, 3-0-0). The course will cover methods of small business financing including equity, borrowing, government assistance; special structures such as partnerships, joint ventures, farmouts and leases. A second major part of the course will deal with sale of securities to the public, the various parties in public financing, preparation of a prospectus, continuous disclosure and stock exchange requirements; evaluation of and issues involved in takeovers. Prerequisite: LAW 451.

#### **LAW 640 Real Estate Transactions**

★3 (fi 6) (either term, 3-0-0). The law relating to purchases and sales of real property, including a review of the following: role of the realtor; statutory and other relevant considerations in a real estate transaction; obligations of vendors in relation to title and quality defects; the closing of a "typical" real estate transaction; the remedies of vendors and purchasers.

#### **LAW 651 Municipal and Planning Law**

★3 (fi 6) (either term, 3-0-0). This course explores the legal framework governing land use policy and regulation in Canada, with particular emphasis on Alberta. We begin with some controversial questions: When should development be regulated, and when is it best left to the market? What powers should local governments have, and what role should they play in land use planning? We proceed to study the development approval process, including the rights of neighbours to challenge undesirable development, and the institutions and processes for resolving land use disputes. We analyze a range of public and private regulatory tools (including Alberta's land use framework, statutory plans, zoning by-laws, subdivision controls, and restrictive covenants and homeowner associations), focusing on their relative efficacy and fairness. Planning theory and economic analysis will be applied to contemporary debates over such problems as sprawl and smart growth, and affordable housing.

#### **LAW 660 Estate Planning**

★3 (fi 6) (either term, 3-0-0). A review of the objectives of estate planning; study of various estate planning techniques with the use of hypothetical problems; an examination of provisions found in the Income Tax Act which affect estate planning, estate tax, and gift tax. Prerequisite: LAW 504.

#### **LAW 665 Corporate Taxation**

★3 (fi 6) (either term, 3-0-0). The tax consequences of corporation financing; amalgamations, mergers, international business transactions; tax planning from a corporation and personal standpoint; and trends in taxation. Prerequisite: LAW 504.

#### **LAW 675 Advanced Evidence**

★3 (fi 6) (either term, 3-0-0). Course is designed to offer an in-depth analysis of several areas of current practical value for lawyers. The course will discuss recent developments and future possibilities relating to hearsay evidence, technology and opinion evidence, children as witnesses, and privileges. The course will track developments as to Charter-connected matters of the law of evidence, relating to burden of proof, discovery and disclosure, and principles of law touching on exclusion of evidence such as the 'discoverability' rule. The course may also examine special evidentiary rules applicable to special tribunals and boards. Prerequisite: LAW 453.

#### **LAW 680 Unjust Enrichment**

★3 (fi 6) (either term, 3-0-0). A study of unjust enrichment and its place in private law, including the concepts of enrichment, corresponding deprivation, and "unjust", methods of restitution of unjust enrichment, and defences to claims for restitution. May not be taken for credit if credit has already been obtained for LAW 680 Restitution.

## **Graduate Courses**

#### **LAW 690 Directed Research**

★3 (fi 6) (either term, 3-0-0). Comprises the major paper requirement for the course based LLM.

#### **LAW 695 Research Paper**

★3 (fi 6) (either term, 3-0-0). This course will give graduate students an opportunity to engage in directed research. The research topic is subject to prior approval of the Course Instructor and the Associate Dean (Graduate Studies). When the student is enrolled in the thesis-based LLM, the research topic shall be different from the thesis topic.

#### **LAW 696 Graduate Seminar - Legal Scholarship: The Theory and Practice of Academic Lawyering**

★3 (fi 6) (either term, 3-0-0). This seminar aims to educate students in the primary theoretical languages and orientations at play in contemporary legal scholarship. On the basis of a structured course of readings, seminar discussions, and lectures, students will be exposed to the traditional discourse of liberal legalism and the

rule of law as well as to various oppositional and critical discourses which have emerged in the legal academy. Particular attention will be paid to the impact these discourses have on the obligations of legal scholars. Enrollment restricted to graduate students.

**LAW 699 Graduate Seminar on Specialized Legal Topics**

★3 (fi 6) (either term, 3-0-0). Graduate Level. These seminars will cover a specialized topic of emerging importance in the law. The particular topic covered would vary depending on the availability of faculty with necessary teaching competence, student interest, and the needs of the legal profession.

**LAW 701 Topics in Criminal Law 1**

★3 (fi 6) (either term, 3-0-0).

**LAW 702 Topics in Criminal Law 2**

★3 (fi 6) (either term, 3-0-0).

**LAW 703 Topics in Criminal Law 3**

★3 (fi 6) (either term, 3-0-0).

**LAW 704 Topics in Criminal Law 4**

★3 (fi 6) (either term, 3-0-0).

**LAW 705 Topics in Private Law 1**

★3 (fi 6) (either term, 3-0-0).

**LAW 706 Topics in Private Law 2**

★3 (fi 6) (either term, 3-0-0).

**LAW 707 Topics in Private Law 3**

★3 (fi 6) (either term, 3-0-0).

**LAW 708 Topics in Private Law 4**

★3 (fi 6) (either term, 3-0-0).

**LAW 709 Topics in Constitutional Law 1**

★3 (fi 6) (either term, 3-0-0).

**LAW 710 Topics in Constitutional Law 2**

★3 (fi 6) (either term, 3-0-0).

**LAW 711 Topics in Constitutional Law 3**

★3 (fi 6) (either term, 3-0-0).

**LAW 712 Topics in Constitutional Law 4**

★3 (fi 6) (either term, 3-0-0).

**LAW 713 Topics in Public Law 1**

★3 (fi 6) (either term, 3-0-0).

**LAW 715 Topics in Public Law 2**

★3 (fi 6) (either term, 3-0-0).

**LAW 716 Topics in Public Law 3**

★3 (fi 6) (either term, 3-0-0).

**LAW 717 Topics in Aboriginal Law 1**

★3 (fi 6) (either term, 3-0-0).

**LAW 718 Topics in Aboriginal Law 2**

★3 (fi 6) (either term, 3-0-0).

**LAW 719 Topics in Aboriginal Law 3**

★3 (fi 6) (either term, 3-0-0).

**LAW 720 Topics in Aboriginal Law 4**

★3 (fi 6) (either term, 3-0-0).

**LAW 721 Topics in Legal History 1**

★3 (fi 6) (either term, 3-0-0).

**LAW 722 Topics in Legal History 2**

★3 (fi 6) (either term, 3-0-0).

**LAW 723 Topics in Legal History 3**

★3 (fi 6) (either term, 3-0-0).

**LAW 724 Topics in Legal History 4**

★3 (fi 6) (either term, 3-0-0).

**LAW 725 Topics in Health Law 1**

★3 (fi 6) (either term, 3-0-0).

**LAW 726 Topics in Health Law 2**

★3 (fi 6) (either term, 3-0-0).

**LAW 727 Topics in Health Law 3**

★3 (fi 6) (either term, 3-0-0).

**LAW 728 Topics in Health Law 4**

★3 (fi 6) (either term, 3-0-0).

**LAW 729 Topics in Corporate and Commercial Law 1**

★3 (fi 6) (either term, 3-0-0).

**LAW 730 Topics in Corporate and Commercial Law 2**

★3 (fi 6) (either term, 3-0-0).

**LAW 731 Topics in Corporate and Commercial Law 3**

★3 (fi 6) (either term, 3-0-0).

**LAW 732 Topics in Corporate and Commercial Law 4**

★3 (fi 6) (either term, 3-0-0).

**LAW 733 Topics in Oil, Gas, and Natural Resources Law 1**

★3 (fi 6) (either term, 3-0-0).

**LAW 734 Topics in Oil, Gas, and Natural Resources Law 2**

★3 (fi 6) (either term, 3-0-0).

**LAW 735 Topics in Oil, Gas, and Natural Resources Law 3**

★3 (fi 6) (either term, 3-0-0).

**LAW 736 Topics in Oil, Gas, and Natural Resources Law 4**

★3 (fi 6) (either term, 3-0-0).

**LAW 737 Topics in International Law 1**

★3 (fi 6) (either term, 3-0-0).

**LAW 738 Topics in International Law 2**

★3 (fi 6) (either term, 3-0-0).

**LAW 739 Topics in International Law 3**

★3 (fi 6) (either term, 3-0-0).

**LAW 740 Topics in International Law 4**

★3 (fi 6) (either term, 3-0-0).

**LAW 741 Topics in Civil Litigation 1**

★3 (fi 6) (either term, 3-0-0).

**LAW 742 Topics in Civil Litigation 2**

★3 (fi 6) (either term, 3-0-0).

**LAW 743 Topics in Civil Litigation 3**

★3 (fi 6) (either term, 3-0-0).

**LAW 744 Topics in Civil Litigation 4**

★3 (fi 6) (either term, 3-0-0).

**LAW 745 Topics in Legal Theory 1**

★3 (fi 6) (either term, 3-0-0).

**LAW 746 Topics in Legal Theory 2**

★3 (fi 6) (either term, 3-0-0).

**LAW 747 Topics in Legal Theory 3**

★3 (fi 6) (either term, 3-0-0).

**LAW 748 Topics in Legal Theory 4**

★3 (fi 6) (either term, 3-0-0).

**LAW 749 Topics in Intellectual Property 1**

★3 (fi 6) (either term, 3-0-0).

**LAW 750 Topics in Intellectual Property 2**

★3 (fi 6) (either term, 3-0-0).

**LAW 751 Topics in Intellectual Property 3**

★3 (fi 6) (either term, 3-0-0).

**LAW 752 Topics in Intellectual Property 4**

★3 (fi 6) (either term, 3-0-0).

## 231.171.1 Non-JD Spring/Summer

**Note:** LAW 300, normally offered in Spring/Summer, is available to students in other faculties. It will not be considered for credit in the JD program.

**LAW 300 Law for Non-Juris Doctor Students I**

★3 (fi 6) (either term, 30 hours). The nature, functions, and sources of law; an outline and components of the Canadian legal system. Note: Not available for credit in the Juris Doctor Program.

## 231.172 Library and Information Studies, LIS

School of Library and Information Studies  
Faculty of Education

### Undergraduate Courses

**LIS 210 Critical Strategies for the Information Universe**

★3 (fi 6) (either term, 2-0-1). This course explores the challenges of acquiring, evaluating and communication information. Students will examine information theory and practical techniques relating to the Internet, databases, and other electronic sources, to develop a critical understanding of the information universe. Open to second, third and fourth year undergraduate students.

**LIS 401 Survey of Children's Literature**

★3 (*fi 6*) (either term, 3-0-0). Literature for children from infancy through the elementary school years. The emphasis is on books currently read by children. Principles of evaluation, children's reading needs and interests, and current issues and trends will be examined. This course is not open to MLIS students.

**LIS 402 Storytelling**

★3 (*fi 6*) (either term, 3-0-0). The past and present forms of storytelling, including the oral tradition, the function of the storyteller, the selection of material and the techniques of telling stories and listening to stories. This course is not open to MLIS students.

**LIS 403 Survey of Young Adult Materials**

★3 (*fi 6*) (either term, 3-0-0). A survey of fiction in all media forms for upper elementary and secondary school-aged readers. Adolescents' reading and media needs and interests, and current issues and trends will be examined. Not open to MLIS students.

**LIS 404 Comic Books and Graphic Novels in School and Public Libraries**

★3 (*fi 6*) (either term, 3-0-0). Examines the history and contemporary reality of comic book publishing and readership in Canada, Great Britain, Japan and the United States, and issues related to perception of the format of educators, librarians, and readers. Focus on collection development, censorship concerns and challenges, gender issues in both readership and content, genres, and impact of the Internet. Not open to MLIS students.

**LIS 405 Canadian Children's Literature for Young People in Schools and Libraries**

★3 (*fi 6*) (second term, 3-0-0). A survey of Canadian children's materials from books for babies to those aimed at the young adult market. Focus on contemporary works, trends in both publishing and content, and issues such as censorship, multimedia forms and the Internet.

**Graduate Courses**

**Note:** All the following courses are restricted to MLIS students and may not be offered each year. Interested students should contact the School of Library and Information Studies for scheduling information. The following courses are required for both the thesis and course-based routes of the MLIS program and are normally prerequisites to the rest of the program: LIS 501, 502, 503, 504, 505, and 506.

**LIS 501 Foundations of Library and Information Studies**

★3 (*fi 6*) (first term, 3-0-0). Introduction to the historical, current, and potential roles of libraries and of library and information professionals in western society. Required course.

**LIS 502 Organization of Information**

★3 (*fi 6*) (either term, 3-0-0). An introduction to the organization of information focusing on theory and principles for application in a variety of settings. Required course.

**LIS 503 Reference and Information Services**

★3 (*fi 6*) (either term, 3-0-0). An introduction to reference and information services and resources. Includes history and varieties of reference services, user populations, instruction, ethics, access issues, the reference interview, search strategies, evaluation of services, and the organization, selection, evaluation, and use of major information resources. Required course.

**LIS 504 Leadership and Management Principles for Library and Information Services**

★3 (*fi 6*) (either term, 3-0-0). An introduction to principles and practices of leadership and management in the professional lives of librarians, archivists, and other information service practitioners. Required course.

**LIS 505 Research Methods for Library and Information Studies**

★3 (*fi 6*) (second term, 3-0-0). Introduction to qualitative, quantitative, and textual research approaches relevant to the field of library and information studies. Includes theoretical discussion of issues and the application of research design principles through the development of a research project proposal. Required course.

**LIS 507 Introductory to Knowledge Management**

★3 (*fi 6*) (either term, 3-0-0). An introduction to different concepts and theories related to knowledge management (KM). Includes knowledge and knowledge management theories and models, KM design, KM informatics, tools and technologies for managing knowledge and an overview of issues in KM.

**LIS 510 Storytelling**

★3 (*fi 6*) (either term, 3-0-0). The past and present forms of storytelling, including the oral tradition, the function of the storyteller, the selection of material and the techniques of telling stories and listening to stories.

**LIS 515 Materials for Young Adults**

★3 (*fi 6*) (either term, 3-0-0). Materials for young adults of junior and senior high school age, young adults' reading interests, and current trends and issues in young adults literature.

**LIS 516 Canadian Children's Literature for Young People in Schools and Libraries**

★3 (*fi 6*) (second term, 3-0-0). A survey of Canadian children's materials from books for babies to those aimed at the young adult market. Focus on contemporary works, trends in both publishing and content, and issues such as censorship, multimedia forms and the Internet.

**LIS 517 Government Publications**

★3 (*fi 6*) (either term, 3-0-0). The control and dissemination of government publications, using the Canadian system as a model applicable to other political jurisdictions.

**LIS 518 Comic Books and Graphic Novels in Schools and Public Libraries**

★3 (*fi 6*) (either term, 3-0-0). Examines the history and contemporary reality of comic book publishing and readership in Canada, Great Britain, Japan and the United States, and issues related to perception of the format by educators, librarians, and readers. Focus on collection development, censorship concerns and challenges, gender issues in both readership and content, genres, and impact of the Internet. Open to MLIS students and other graduate students.

**LIS 519 Introduction to Children's Literature**

★3 (*fi 6*) (either term, 3-0-0). Literature for children from infancy through the elementary school years, principles of evaluation and selection, and current issues and trends.

**LIS 520 Information Resources in Specialized Fields**

★1-3 (*variable*) (either term, variable). Information resources and their administration in a specialized field and for a specialized clientele. The emphasis is on the nature of the field, problems of collection development, bibliographic access, retrieval and use by the clientele, and administrative issues in solving these problems. Specialized fields regularly examined are law, business, and health sciences.

**LIS 526 Instructional Practices in Library and Information Services**

★3 (*fi 6*) (either term, 3-0-0). Theory and practice related to the teaching roles of the librarian or information professional. Includes planning, implementation and evaluation of pedagogical approaches for the design of effective information literacy and professional development instructional sessions.

**LIS 531 Collection Management**

★3 (*fi 6*) (either term, 3-0-0). An analytical approach to collection management including the acquisition, review and evaluation of collections.

**LIS 532 Cataloguing and Classification**

★3 (*fi 6*) (either term, 3-0-0). To prepare students to construct a catalogue, to create catalogue records for various forms of materials in diverse Library situations and to evaluate Online Public Access Catalogues.

**LIS 533 Database Design for Information Management**

★3 (*fi 6*) (either term, 3-0-0). An introduction to core concepts, principles, and techniques of database design for information management, from user requirement analysis, to data and information modeling and querying.

**LIS 534 Information Architecture: Web Design for Usability**

★3 (*fi 6*) (either term, 3-0-0). An examination of the principles and practice of web usability, with a focus on information architecture, layout and design, metadata, and other topics related to effective web design and management. Includes an introduction to HTML and other web coding. Prerequisites: LIS 501, 502, 503, 506. Corequisite: LIS 505.

**LIS 535 Advanced Topics in the Organization of Knowledge**

★3 (*fi 6*) (either term, 3-0-0). An examination of the principles and practice of indexing, abstracting, thesaurus construction, metadata, or other topics relevant to the organization of knowledge.

**LIS 536 Digital Reference and Information Retrieval**

★3 (*fi 6*) (either term, 3-0-0). An examination of the integration of digital services into the array of reference services, with an emphasis on information retrieval systems and their effective use by professionals and end users. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**LIS 538 Digital Libraries**

★3 (*fi 6*) (either term, 3-0-0). An introduction to the concept, development, types and trends of digital libraries. This course will focus on the creation, organization, access, use and evaluation of digital libraries with a view to socioeconomic and cultural issues. Prerequisites: LIS 534.

**LIS 542 Library Preservation, Security, and Risk Management**

★3 (*fi 6*) (either term, 3-0-0). An introduction to and overview of the role and activities of preservation administration in libraries of all kinds, from the physical preservation and conservation of book and multimedia collections, to risk management and insurance, prevention of theft and vandalism, disaster contingency planning and preparedness, through post-disaster salvage and recovery operations.

**LIS 545 Management of Resources in Library and Information Services**

★3 (*fi 6*) (either term, 3-0-0). The field of resource management and its application in library and information services.



**LIS 546 Marketing Library and Information Services**

★3 (fi 6) (either term, 3-0-0). The principles of marketing and public relations for nonprofit organizations, with an emphasis on library and information services.

**LIS 548 Library Services to Children and Young Adults**

★3 (fi 6) (either term, 3-0-0). The principles and practices of library service to children and young adults. Prerequisite: LIS 515 or 519.

**LIS 580 Contemporary Theories and Practices of Reading**

★3 (fi 6) (either term, 3-0-0). A study of different theories of reading (e.g. social, psychological, literary) and of sites and practices of literacy in an era of rapid cultural and technological change.

**LIS 585 Multimedia Literacies**

★3 (fi 6) (either term, 3-0-0). An introduction to the theories, practices and implications of multimedia literacies. Examples of multimedia texts include print, video, audio, CD-ROM, DVD, computer programs, digital games, hypermedia, Internet sites, graphic forms, electronic books, and text-based toys, games, and commodities. The course will explore the cultural, social, commercial, and educational issues raised by the proliferation of such texts.

**LIS 586 History of the Book**

★3 (fi 6) (either term, 3-0-0). The historical, aesthetic, and economic bases of the 'book' and its role in the recording and preservation of information and ideas.

**LIS 587 Facilities Planning for Libraries and Information Centres**

★3 (fi 6) (either term, 3-0-0). The examination of the building needs of various types of libraries and information centres, the involvement of information professionals and architects in the planning process, and various contemporary building styles.

**LIS 590 Practicum**

★3 (fi 6) (either term, 100 hours). The application of LIS theories and principles through experiential learning in a library, archives, records management and other services settings.

**LIS 591 Publishing**

★3 (fi 6) (either term, 3-0-0). The organized business of writing, manufacturing and marketing of books and other media.

**LIS 592 Intellectual Freedom and Social Responsibility in Librarianship**

★3 (fi 6) (either term, 3-0-0). An examination of the central concepts of intellectual freedom and social responsibility and the range of related issues impacting librarians, library institutions, and library associations. Prerequisite: LIS 501.

**LIS 593 Archives Administration**

★3 (fi 6) (either term, 3-0-0). Theories, standards and methods used in management of modern archives, with an historical overview and an emphasis on contemporary theory and practice.

**LIS 594 Records Management**

★3 (fi 6) (either term, 3-0-0). The theory and techniques of records management.

**LIS 597 Seminar in Advanced Research**

★3 (fi 6) (first term, 0-3s-0). In-depth exploration of qualitative, quantitative and textual research approaches for students pursuing thesis-route master's programs or other advanced projects, through the implementation of a small-scale research study. Permission of the instructor is required.

**LIS 598 Special Topics**

★1-3 (variable) (either term, variable). A current topic of significance to, or a special aspect of, library and information studies may be examined as demand and resources permit.

**LIS 599 Directed Study**

★3 (fi 6) (either term, 0-3s-0). Further study of special topics and issues, based on knowledge acquired in previous courses or on significant prior experience. Topic to be approved by the School.

**LIS 600 Capping Exercise**

★0 (fi 1) (either term, 12 hours). The required capping exercise will be a World Wide Web version of the students best work in the MLIS program, and a reflective paper on the significance of the work. The capping exercise paper is to be submitted during the final term of course work.

**LIS 697 Seminar in Doctoral Research**

★3 (fi 6) (first term, 0-3s-0). In-depth exploration of qualitative, quantitative and textual research approaches for students pursuing doctoral programs or other advanced projects, through the implementation of a small-scale research study. Permission of the instructor is required.

**LIS 699 Directed Study**

★3 (fi 6) (either term, 0-3s-0). Further study at the doctoral level of special topics and issues, based on knowledge acquired in previous courses or on significant prior experience. Topics must be approved by the School.

**231.173 Linguistics, LING**

Department of Linguistics  
Faculty of Arts

**Undergraduate Courses****O LING 100 Introduction to Human Language**

★3 (fi 6) (either term, 3-0-0). An introduction to how human language works: how it is structured, how it is learned, how it is used in different societies and how it changes over time. Note: Not to be taken by students with credit in LING 102.

**O LING 101 Introduction to Linguistic Analysis**

★3 (fi 6) (either term, 3-0-0). Central concepts of linguistics: linguistic categories and structure (phonetics, phonology, morphology, syntax, semantics). Note: May not be taken by students with credit in LING 111.

**O LING 102 Introduction to Linguistics II**

★3 (fi 6) (either term, 3-0-0). An introduction to cross-disciplinary and applied areas in linguistics (e.g. language change, language acquisition, language in society). Pre- or corequisite: LING 101.

**LING 111 Intro to Linguistic Analysis for Language Revitalization**

★3 (fi 6) (Spring/Summer, 3-0-0). Central concepts of linguistics: linguistic categories and structure (phonetics, phonology, morphology, syntax, semantics) with special attention to Canadian Indigenous languages. Restricted to CILLDI program students. Note: Not to be taken by students with credit in LING 101.

**O LING 204 English Syntax**

★3 (fi 6) (either term, 3-0-0). Linguistic analysis of the syntax of modern English. Prerequisite: LING 101.

**O LING 205 Phonetics**

★3 (fi 6) (either term, 3-0-0). Recognizing, transcribing, and producing speech sounds using the International Phonetic Alphabet; problems in phonetic analysis; elementary acoustic phonetics; techniques for describing the sound system of an unfamiliar language. Prerequisite: LING 101.

**LING 211 Phonetics of Indigenous Languages**

★3 (fi 6) (either term or Spring/Summer, 3-0-0). Recognizing, transcribing, and producing speech sounds using the International Phonetic Alphabet; problems in phonetic analysis; elementary acoustic phonetics; techniques for describing the sound system of Canadian Indigenous languages. Prerequisite: LING 101 or 111. Restricted to CILLDI program students. Note: Not to be taken by students with credit in LING 205.

**LING 212 Morphosyntax of Indigenous Languages**

★3 (fi 6) (Spring/Summer, 3-0-0). Morphological structure and meaning in Canadian Indigenous languages, including how best to represent lexical meaning and form in a dictionary, how new words might be coined, and how these languages with their complex morphology and verb systems might be taught to adult learners. Prerequisite: LING 101 or LING 111. Restricted to CILLDI program students. Note: Not to be taken by students with credit in LING 308 or 309.

**LING 213 Sentence and Discourse Patterns of Indigenous Languages**

★3 (fi 6) (Spring/Summer, 3-0-0). Types of sentence and discourse patterns in Canadian Indigenous languages; attention to real language use across different genres (e.g. traditional stories, conversation, personal narratives, oratory and ceremony) so that CLC students can go on to collect and transcribe samples of language in context rather than word lists or sentences in isolation. Prerequisite: LING 101 or LING 111. Restricted to CILLDI program students. Note: Not to be taken by students with credit in LING 308 or 309.

**O LING 308 Morphology and the Lexicon**

★3 (fi 6) (either term, 3-0-0). Basic principles of word formation and structure across languages: the organization of the lexicon and representation of words. Prerequisites: LING 101, 204 and 205.

**O LING 309 Syntax and Semantics**

★3 (fi 6) (either term, 3-0-0). Basic principles in syntax (constituent structure, sentence relatedness, grammatical relations) and semantics (word meaning, semantic roles, event structure). Prerequisites: LING 101 and 204.

**O LING 310 Introductory Phonology**

★3 (fi 6) (either term, 3-0-0). Basic principles of phonological analysis across languages: the organization of the lexicon and representation of words. Prerequisites: LING 101 and 205.

**LING 311 Special Topics in Linguistics**

★3 (fi 6) (either term or Spring/Summer, 3-0-0). A study of recent developments in particular subareas of linguistics with special attention to the Indigenous languages of Western Canada. Prerequisite: LING 111 or consent of Department. Restricted to CILLDI program students.

**O LING 314 Discourse Analysis**

★3 (fi 6) (either term, 3-0-0). Analysis of selected approaches to the study of discourse including conversational analysis, narrative structure, text analysis. Prerequisite: LING 101. Not offered every year.

**LING 316 Sociolinguistics**

★3 (fi 6) (either term, 3-0-0). An examination of phonological, syntactic, lexical, and semantic variation in language systems in connection with extra-linguistic factors such as individual, social, or demographic differences. Prerequisite: LING 101. Not offered every year.

**LING 319 Child Language Acquisition**

★3 (fi 6) (either term, 3-0-0). Basic issues in first language acquisition: theories, research methods, and major findings. Prerequisite: LING 101. LING 204 and 205 recommended.

**LING 320 Second Language Acquisition**

★3 (fi 6) (either term, 3-0-0). Application of linguistics to theoretical issues in second-language acquisition: properties of language, problems of languages in contact, psycholinguistic aspects of bilingualism. Prerequisite: LING 101. Recommended: LING 204.

**LING 321 Neurolinguistics**

★3 (fi 6) (either term, 3-0-0). A neurolinguistic approach to the representation and processing of linguistic structures in the brain; patterns of language breakdown resulting from damage to the brain. Prerequisites: LING 101 and 204, or consent of Department. Not offered every year.

**LING 323 Linguistics and the Mind**

★3 (fi 6) (either term, 3-0-0). The role of language and linguistics in the understanding of human information processing and the nature of mental representations. Prerequisite: LING 101.

**LING 324 Endangered Languages**

★3 (fi 6) (either term, 3-0-0). An examination of languages facing extinction: how language endangerment arises, local and global factors affecting loss, how linguistic and cultural diversity suffers, and how linguists can respond. Prerequisite: LING 101.

**LING 325 Writing Systems**

★3 (fi 6) (either term, 3-0-0). History and typology of writing systems and how different writing systems influence the reading process. Prerequisite: LING 101.

**LING 375 Linguistics Directed Research I**

★3 (fi 6) (either term, 0-3s-0). Independent study of a particular sub-area of linguistics. Normally offered as a reading course and directed research practicum through special prior arrangement. Prerequisite: Consent of Instructor.

**LING 399 Special Topics in Linguistics**

★3 (fi 6) (either term, 3-0-0). A study of recent developments in particular sub-areas of linguistics. Prerequisite: consent of Department. Normally offered only as a reading course through special arrangement.

**LING 400 Psycholinguistics**

★3 (fi 6) (either term, 3-0-0). Issues and methods involved in the experimental study of language production, comprehension, and acquisition. Prerequisites: Any two of LING 308, 309 or 310. Recommended: a course in elementary statistics.

**LING 401 Semantics**

★3 (fi 6) (either term, 3-0-0). An overview of natural language semantics across languages at both the lexical and clause levels. Topics covered include sense, reference, features, compositionality, semantic roles, logical form, categorization, and conceptualization. Prerequisite: LING 309. Not offered every year.

**LING 405 Historical Linguistics**

★3 (fi 6) (either term, 3-0-0). Principles and methods in the study of language change. Prerequisite: LING 310. Not offered every year.

**LING 407 Linguistic Typology**

★3 (fi 6) (either term, 3-0-0). A survey of similarities, differences, tendencies, and universals in the phonological, morphological, and syntactic patterns of different languages. Prerequisite: LING 309. Not offered every year.

**LING 419 Linguistics and Child Language Disorders**

★3 (fi 6) (either term, 3-0-0). Linguistic characteristics of language disorders across special populations of children. Theoretical issues in linguistic approaches to developmental language disorders. Prerequisite: LING 319; 309 recommended.

**LING 420 Phonological Acquisition**

★3 (fi 6) (either term, 3-0-0). An overview of data, theories and methodologies in the study of phonological development, including L1 and L2 production and perception. Prerequisite: LING 310.

**LING 475 Linguistics Directed Research II**

★3 (fi 6) (either term, 0-3s-0). Advanced study of a particular sub-area of linguistics. Normally offered as a reading course and directed research practicum through special prior arrangement. Prerequisite: LING 375 and Consent of Instructor.

**LING 499 Special Topics in Linguistic Theory**

★3 (fi 6) (either term, 3-0-0). A course designed to explore recent developments in particular areas of linguistic theory. Prerequisite: consent of Department. Normally offered only as a reading course through special arrangement.

**LING 500 Psycholinguistics**

★3 (fi 6) (either term, 3-0-0). Issues and methods involved in the experimental study of language production, comprehension, and acquisition. Prerequisite: LING 400 or consent of the department. Recommended: A course in elementary statistics.

**LING 501 Research Project Seminar**

★3 (fi 6) (first term, 3-0-0). Requires a literature review, devising research methodology, writing and defending a project proposal. Prerequisite: consent of Department. Note: Required for BA Honors students in Linguistics in their final year. Restricted to BA Honors and graduate students in Linguistics.

**LING 502 Honors Project**

★3 (fi 6) (either term, 3-0-0). Directed Honors thesis. Prerequisites: LING 501 and consent of Department. Note: Required for and Restricted to BA Honors students in Linguistics in their final year.

**LING 509 Syntactic Theory**

★3 (fi 6) (either term, 3-0-0). Advanced syntactic analysis and related theoretical issues. Prerequisite: LING 309 or consent of Department. Note: Required for BA Honors in Linguistics.

**LING 510 Current Phonological Theory**

★3 (fi 6) (either term, 3-0-0). Current approaches to phonological theory, focusing on constraint-based analysis. Prerequisite: LING 310 or consent of Department. Note: Required for BA Honors in Linguistics.

**LING 511 Special Topics in Linguistic Research**

★3 (fi 6) (either term or Spring/Summer, 3-0-0). A study of recent developments in particular areas of linguistic research with special attention to the Indigenous languages of Western Canada. Prerequisite: LING 111 and/or consent of Department. Restricted to CILLDI program students.

**LING 512 Acoustic Phonetics**

★3 (fi 6) (either term, 3-0-0). Analysis of the articulatory, perceptual, and acoustic aspects of speech signal; measuring the acoustic aspects of speech. Prerequisite: LING 310 or 312 (formerly LING 412).

**LING 513 Speech Technology**

★3 (fi 6) (either term, 3-0-0). Introduction to speech synthesis and speech recognition, with some time allotted to other speech and language technologies. The purpose of this course is to give students background that would be useful for work in the speech technology industry. Prerequisite: LING 205 or consent of Department.

**LING 515 Field Methods**

★3 (fi 6) (either term, 3-0-0). Practical experience in linguistic data collection and analysis of the sound and form systems of an unfamiliar language. Prerequisites: LING 205, 309 (formerly 209), and 310 (formerly 210) or consent of Department. Not offered every year.

**LING 516 Languages in Contact**

★3 (fi 6) (either term, 3-0-0). Variation in language and language usage in bilingual and cross-linguistic situations. Prerequisite: Consent of Department.

**LING 519 Corpus Linguistics**

★3 (fi 6) (either term, 3-0-0). Theoretical and practical issues relating to using corpora in linguistic analysis: principles of corpus construction, application of corpus techniques to problems in linguistics, frequency counts, collocational searches, creating databases out of search results. Prerequisites: LING 309 and 310 or consent of department.

**LING 520 Computational Linguistics**

★3 (fi 6) (either term, 3-0-0). Theoretical and implementation aspects of: computational morphology and phonology, part-of-speech tagging, parsing, grammar engineering, lexical semantics, and corpus analysis. Prerequisites: LING 308, 209 and 310; or Consent of Department.

**LING 599 Special Topics in Linguistic Research**

★3 (fi 6) (either term, 3-0-0). A study of recent developments in particular areas of linguistic research. Prerequisite: consent of Department. Formerly LING 443.

**Graduate Courses****LING 601 Phonology I**

★3 (fi 6) (either term, 0-3s-0). Current approaches to phonological theory, focusing on constraint-based analysis-advanced level. Prerequisite: consent of Department.

**LING 602 Seminar in Syntax**

★3 (fi 6) (either term, 0-3s-0). Critical examination of selected theoretical issues in morphosyntax. Prerequisite: consent of Department.

**LING 604 Seminar in Psycholinguistics**

★3 (fi 6) (either term, 0-3s-0). A review of the current theories and research in psycholinguistics. Prerequisite: LING 500.

**LING 605 Seminar in Experimental Phonetics**

★3 (fi 6) (either term, 0-3s-0). A survey of the present state of knowledge in

speech production and perception. Prerequisite: LING 512 (LING 412 prior to 1997-98). Note: offered in alternate years.

#### LING 606 Seminar in Sociolinguistics

★3 (fi 6) (either term, 3-0-0). Sociolinguistics of minority/L2 language situations including standard/non-standard variants and societal challenges that accompany bilingualism. Prerequisite: Consent of Department.

#### LING 607 Linguistic Typology

★3 (fi 6) (either term, 0-3s-0). An examination of implications that the study of language universals and linguistic typology has for theories of grammar. Prerequisite: consent of Department. Note: offered in alternate years.

#### LING 608 Morphology

★3 (fi 6) (either term, 0-3s-0). Current approaches to morphological theory and analysis and their implications for grammatical theory and models of the lexicon. Prerequisite: consent of Department. Note: offered in alternate years.

#### LING 610 Formal Grammatical Theory

★3 (fi 6) (either term, 0-3s-0). In-depth examination of a current grammatical theory. Prerequisite: LING 602 or consent of Department. Note: offered in alternate years.

#### LING 611 Phonology II

★3 (fi 6) (either term, 0-3s-0). Current examination of selected theoretical topics in phonology, focusing on issues of representation. Prerequisite: LING 601 or consent of Department. Note: offered in alternate years.

#### LING 619 Methods in Corpus Linguistics

★3 (fi 6) (either term, 0-3s-0). Technical and practical training in corpus linguistics. Prerequisite: LING 519.

#### LING 636 Analysis of Meaning

★3 (fi 6) (either term, 0-3s-0). Analysis of natural language semantic systems with a focus on lexical, grammatical, conceptual, and typological aspects of meaning. Prerequisite: Consent of Department.

#### LING 638 Topics in Child Language Acquisition

★3 (fi 6) (either term, 0-3s-0). Recent theoretical and empirical research on child language acquisition. Special focus on either bilingual, second language, or language-impaired populations of child learners. Prerequisite: Consent of Department.

#### LING 639 Topics in Phonological Acquisition

★3 (fi 6) (either term, 3-0-0). Recent theoretical and empirical developments in L1 and L2 phonological acquisition, including novel data, methodologies, and learning algorithms. Prerequisite: Consent of Department.

#### LING 683 Conference Course I

★3 (fi 6) (first term, 0-3s-0).

#### LING 684 Conference Course II

★3 (fi 6) (second term, 0-3s-0).

#### LING 693 Generals Paper I

★3 (fi 6) (variable, unassigned).

#### LING 694 Generals Paper II

★3 (fi 6) (variable, unassigned).

#### LING 903 Directed Research Project

★3 (fi 6) (either term, unassigned). Represents research activity equivalent to ★3 for registration status and fee assessment purposes.

#### LING 906 Directed Research Project

★6 (fi 12) (either term, unassigned). Represents research activity equivalent to ★6 for registration status and fee assessment purposes.

#### LING 909 Directed Research Project

★9 (fi 18) (either term, unassigned). Represents research activity equivalent to ★9 for registration status and fee assessment purposes.

## 231.174 Linguistique, LINGQ

Faculté Saint-Jean

### Cours de 1er cycle

#### **O** LINGQ 200 Introduction à l'étude du langage

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude du langage comme phénomène social et individuel. La langue et son fonctionnement.

#### **O** LINGQ 300 Lexicologie et terminologie

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude des approches et des techniques en lexicologie et en terminologie. Analyse de ressources documentaires et mises en application.

#### LINGQ 305 Étude historique du vocabulaire français

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Historique du lexique français en parallèle avec l'historique de l'anglais. Facteurs externes (événements historiques) et facteurs

internes (évolution phonétique). Description de phénomènes lexicaux. Mise en application de stratégies de transferts linguistiques. Préalable : LINGQ 200.

#### **O** LINGQ 320 Phonétique et phonologie du français canadien

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Phonétique et phonologie du français canadien. Préalable(s): LINGQ 200 ou l'équivalent.

## 231.175 Maintaining Registration, M REG

University of Alberta

### Graduate Courses

#### M REG 800 Maintaining Registration

★0 (fi 6) (either term, unassigned). Maintaining registration in a graduate program and status as a graduate student. Graduate students who do not plan to register either in courses or in Theses or a project course but who wish to maintain their position in a program and their status as graduate students can register in M REG.

## 231.176 Maîtrise ès sciences de l'éducation, M EDU

Faculté Saint-Jean

Les cours M EDU sont réservés aux étudiants inscrits dans un programme de 2e ou de 3e cycle.

### Cours de 2e cycle

#### M EDU 500 Langue, culture et éducation

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude interdisciplinaire (anthropologie, sociologie, psychologie sociale) des théories scientifiques contemporaines sur la nature de la culture, ses rapports avec la langue et ses mécanismes de transmission et de modification. La problématique locale sera examinée dans le contexte de la communauté scientifique internationale. L'histoire de la science de l'éducation bilingue sera aussi abordée. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

#### M EDU 501 La culture et l'individu

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude de la relation entre culture et personnalité dans les sociétés homogènes selon les théories de l'anthropologie psychologique. L'application de ces principes aux sociétés industrialisées permettra de mieux comprendre le développement de l'identité culturelle chez l'être humain et ses rapports avec l'identité de soi dans/parmi les groupes ethno-culturels en situation minoritaire. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

#### M EDU 510 Psychologie de l'apprentissage d'une deuxième langue

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Analyse des divers facteurs qui influencent l'apprentissage d'une deuxième langue. Etude des différentes dimensions du bilinguisme (aspects psychologique, cognitif, socio-linguistique, et socio-culturel). Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

#### M EDU 511 Fondements théoriques de l'acquisition de la langue

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude des diverses théories de l'acquisition de la langue. Le rôle de la langue dans le développement de l'enfant. Le lien entre le développement langagier et le développement cognitif. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

#### M EDU 512 Enseigner l'écriture selon une approche socioconstructiviste

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Ce cours comprend une partie théorique et une partie pratique. Dans la partie théorique, les étudiants auront l'occasion de réfléchir à la notion de qualité en abordant les concepts de cohérence textuelle et de type de texte. Ils approfondiront également leur connaissance du processus d'écriture et de son acquisition ainsi que du fonctionnement cognitif des scripteurs novices et experts. Dans la partie pratique, ils se familiariseront avec une approche socioconstructiviste de l'enseignement de la production écrite et élaboreront une séquence d'apprentissage dans un type de texte donné selon les principes énoncés dans la première partie du cours. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

#### M EDU 520 Tendances actuelles en éducation des francophones

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude des phénomènes propres à l'éducation des Francophones au Canada selon la pratique et la recherche effectuées dans les diverses provinces: abandon du bilinguisme institutionnel; programmes socio-culturels; innovations en didactique de la langue maternelle. Peut comprendre



des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 521 Tendances actuelles en pédagogie de l'immersion française**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude critique des orientations théoriques et des pratiques actuelles dans la pédagogie de l'immersion française. Analyse de questions importantes dans l'implantation des programmes d'immersion. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 530 La problématique de l'enseignement des langues**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude de la langue et de son impact sur le développement de la personne. Nouvelles orientations centrées sur les réalités de l'enseignement des langues telles que l'intégration des matières, l'individualisation, l'enseignement par atelier, etc. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 531 La problématique de la technologie et de la science face au curriculum**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude des récents développements technologiques, scientifiques et sociaux qui ont un impact significatif sur le curriculum. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 532 L'écologie de la salle de classe**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude des influences et des relations interpersonnelles qui ont un effet sur l'apprentissage, l'enseignement et la communication en salle de classe. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 533 L'évaluation en milieu scolaire**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude des différents types d'évaluation utilisés dans le milieu scolaire selon les objectifs poursuivis et les innovations récentes en évaluation. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 534 Les troubles du comportement externalisés chez l'enfant**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Ce cours vise à initier l'étudiant aux problèmes de comportement de type extériorisé. L'étudiant aura également l'occasion de se familiariser aux courants théoriques contemporains et à l'approche développementale des problèmes extériorisés (agressivité, trouble oppositionnel avec provocation et troubles de la conduite). De même, les thèmes suivants seront présentés : profils et caractéristiques de l'élève ayant des problèmes extériorisés, épidémiologie, étiologie et facteurs d'influence. Enfin, il sera question des facteurs de risque et de protection ainsi que des retombées de ces facteurs sur la gestion et la dynamique de la classe. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 535 Le trouble déficitaire de l'attention/hyperactivité chez l'élève**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Ce cours vise à initier l'étudiant au trouble déficitaire de l'attention/hyperactivité (TDAH). L'étudiant aura également l'occasion de se familiariser à l'approche neuro-développementale et multimodale du TDAH. De même, les thèmes suivants seront présentés : profils et caractéristiques de l'élève ayant un TDAH, épidémiologie, étiologie et facteurs d'influence. Enfin, il sera question des facteurs de risque et de protection ainsi que des retombées de ces facteurs sur la gestion et la dynamique de la classe. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 540 Dimensions politiques et administratives de l'éducation bilingue**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude des structures de l'éducation française et bilingue dans les diverses provinces canadiennes et du rapport existant entre ces structures et le contexte sociopolitique. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 541 Enseignement des langues assisté par ordinateur**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Ce cours vise à faire connaître les différentes approches et les fondements de l'enseignement des langues assisté par ordinateur. Il vise aussi à fournir les outils pour concevoir, construire et évaluer des didacticiels. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 560 L'administration de l'éducation**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude approfondie de concepts d'administration. Les rôles du gestionnaire de l'éducation. Gestion des ressources humaines et financières en éducation. Examen des problèmes en milieu d'éducation

et analyse de solutions administratives pertinentes. culturel). Peut comprendre des sections Alternative Delivery veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 561 Formation des habiletés de supervision et de leadership**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Principes, organisation et techniques de supervision. Le développement des habiletés de leadership en gestion, particulièrement pour l'éducation en français. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 562 Stage pratique de direction**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Vise à développer des habiletés en observation, en entrevues, en animation de groupes et en réflexion lors de visites dans des écoles et en travaillant avec la direction des écoles.

**M EDU 580 Méthodologie de la recherche en éducation I**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude du processus de la recherche et des concepts de base de la recherche en éducation. Présentation des divers types de recherches: méthodes de collecte de données et les instruments, analyse et interprétation. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 581 Méthodologie de la recherche en éducation II**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Pendant ce cours, chaque étudiant doit approfondir son projet de recherche. Après un survol des devis expérimentaux (ou d'échantillonnage selon le cas), de la statistique descriptive et inférentielle, et de la probabilité, chacun fera une analyse multi-causale du problème (visant à intégrer ses recherches qualitatives et quantitatives), développera son hypothèse et des méthodes de collecte convenables, et choisira les tests statistiques appropriés: moyennes, méta-analyse avec écarts-types, régressions ou corrélations multiples, Chi carré, tests non-paramétriques, ANOVA, ANCOVA, MANOVA et d'autres analyses multivariées. Sera enseigné surtout: le choix des tests appropriés; l'utilisation des ordinateurs dans le traitement, la synthèse et la présentation graphique des données; comment éviter les erreurs d'interprétation et de prédiction. Préalable(s): M EDU 580. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 582 Séminaire de recherche**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Rédaction d'un exposé écrit dans lequel l'étudiant doit tenter de préciser le problème qui est à la source de sa recherche et les objectifs de celle-ci, de situer le sujet étudié dans un cadre de référence général, de formuler la problématique de la recherche. Présentation par l'étudiant d'un exposé écrit. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 583 La recherche et le praticien**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude des retombées de la recherche sur la pratique éducative. Méthodologie de la recherche-action, et la formation professionnelle continue des enseignants. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 589 Le processus créateur chez l'enseignant**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Ce cours approfondit les dimensions multiples du processus créateur dans les pratiques éducatives. Un apprentissage interdisciplinaire fait état des recherches théoriques et pratiques visant à développer ce processus dans divers contextes culturels. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 594 Lectures dirigées**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0).

**M EDU 596 Thème ouvert**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 597 Séminaire portant sur l'enseignement au niveau élémentaire et secondaire**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 598 Choix de sujet en éducation**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**M EDU 599 Étude personnelle dirigée**  
★3 (fi 6) (l'un ou l'autre semestre, 3-0-0).

**M EDU 900 Activité de synthèse**  
★3 (fi 6) (variable, unassigned).

## 231.177 Management Information Systems, MIS

Department of Accounting, Operations, and Information Systems  
Faculty of Business

**Note:** Enrolment in all MIS courses is restricted to students registered in the Faculty of Business, or to students registered in specified programs that require Business courses to meet degree requirements and who have obtained prior approval of their Faculty.

### Undergraduate Courses

#### MIS 311 Management Information Systems

★3 (fi 6) (either term, 3-0-1). Introduction to all major areas of information systems. Technology and file systems, organizational and behavioral issues, datamodeling, databases, expert systems, systems analysis, systems development life cycle, etc. Development of analytical skills which can be brought to bear on MIS problems. Notes: Students are expected to have basic familiarity with microcomputer applications (word processing, spreadsheets, personal data base, presentation graphics, personal information manager, email, web browser). The lab component will be taught for up to 10 weeks.

#### MIS 412 Managerial Support Systems

★3 (fi 6) (either term, 3-0-0). Provides students with an understanding of the interaction between decision-making and technology within organizational contexts. Within the context of decision support systems (DSS), focus is on four key components: 1) the technology; 2) the broader context, including the decision-making styles which exist at the organizational, group and individual levels; 3) the design and development of DSS; 4) the effectiveness of DSS to support decision-making processes, including issues of implementation and evaluation. Prerequisite: MIS 311.

#### MIS 413 Systems Analysis and Design

★3 (fi 6) (either term, 3-0-0). Examination of the critical stages of the systems development process. These include the initiation, planning, analysis, design, implementation and maintenance of information systems needed to support business functions in organizations. The concepts of life cycle, requirements definition, analysis and design methods, and computer-assisted software engineering (CASE) tools are presented. Specific modeling techniques such as process models, data models and logic models are examined in detail. Hands-on experience with a high-end CASE tool are provided. Prerequisite: MIS 311.

#### MIS 415 Data Base Design and Administration

★3 (fi 6) (either term, 3-0-2). Application of database concepts in organizations. A comprehensive introduction to the design and development of relational databases from a logical data model. The relational database access language SQL is used along with a number of key-software development tools. Effective data administration techniques for enforcing integrity and security as well as enhancing performance are discussed. Topics of special current interest include data warehousing and the object-oriented data model. Prerequisite: MIS 311. Note: There will be a lab component for up to ten weeks during the term.

#### MIS 417 Telecommunications in Business

★3 (fi 6) (either term, 3-0-0). An introduction to fundamental concepts required to understand and apply telecommunication technologies within a business environment. Emphasizes the principles of those technologies to familiarize the students with the fundamental concepts and terminology of telecommunications. Telecommunications equipment, networks, protocols and architectures are introduced and discussed regarding their relevance and impact on business-oriented organizations. Also introduces managerial aspects such as planning, design and performance of telecommunication systems. Prerequisite: MIS 311.

#### MIS 418 Electronic Commerce

★3 (fi 6) (either term, 3-0-0). An examination of the development of electronic commerce in business across a number of different sectors. Using a process modelling approach, traditional vs. electronic business transactions are discussed in business-to-business and business-to-consumer modes; strategies for e-commerce are developed with a focus on the appropriate technical architecture to support business in an electronic marketplace. In particular, requirements of payment systems, and issues of security and privacy are discussed as key considerations in implementation. The course uses software development tools in the implementation of these electronic commerce strategies. Prerequisite: MIS 311.

#### MIS 419 Systems Development Using Advanced Software Tools

★3 (fi 6) (either term, 3-0-2). Covers the physical design and implementation of computer systems with modern software development tools. Is a continuation of the systems analysis and design topics introduced in MIS 413 and uses the outcomes of the logical systems analysis and design process to create the actual system. Prerequisite: MIS 413. Corequisites: MIS 415 and CMPUT 115, or consent of Department. Note: There will be a lab component for up to 12 weeks during the term. Credit may not be obtained for both MIS 419 and CMPUT 301 or 401.

#### MIS 424 Introduction to Information Systems Project Management

★3 (fi 6) (either term, 3-0-0). Examines information system development project management. The system development project is a multi-stage activity involving investigation and analysis, scope definition, resource analysis and estimation, timing estimation, cost estimation, scheduling, monitoring, and implementation. Prerequisite: MIS 311.

#### MIS 426 Technology-Enabled Business Process Management

★3 (fi 6) (either term, 3-0-0). Focuses on the major operational activities and tasks that have come to be called business processes. Will identify and categorize key business processes, demonstrate process mapping as a method of business process analysis, and demonstrate process redesign principles as a way to better manage these processes. Will feature the role of IT in process redesign. Prerequisite: MIS 311.

#### MIS 427 Information System Security Management

★3 (fi 6) (either term, 3-0-0). This course focuses on Information System Security from a Managerial point of view. It examines the IT security needs of all business areas. The course covers aspects of threat assessment, policy creation and enforcement, implementation and the hurdles involved, auditing, and forensics. It also looks at the different ways that compromises can occur and how to detect and prevent them from a planning and Disaster Recovery level. A great many real world examples are used as well as exposing the student to current technology that is used in industry. The main focus is from a manager's point of view and teaches planning skills that are important in a field that grows on a daily basis. Prerequisite: MIS 311.

#### MIS 435 Information, Ethics and Society

★3 (fi 6) (either term, 3-0-0). For students in all majors who are interested in information and the roles it plays in business and society. Focus is on the nature and basic characteristics of information, and its importance in contemporary society, viewing information as a commodity that is produced, used, bought and sold. Two aspects of the ways in which information affects people are emphasized: (1) ethical issues relating to professions, businesses, government, and individuals; (2) the impact of information technology and technological change on society. Prerequisites: Open only to third or fourth year Business students, or by consent of Department Chair. Credit may be granted for only one of ACCTG 435, BUS 435 or MIS 435.

#### MIS 437 Accounting Information Systems

★3 (fi 6) (either term, 3-0-0). An introduction to the field of computerized accounting information systems in organizations from the perspective of the information system professional. Accounting information systems are typically the foundation for many other information systems in organizations. Concentrates on the design of accounting information systems in organizations and integration of accounting information systems with other functional area and management information systems as well as commonalities in the system development process for accounting and other functional area information systems. Prerequisites: ACCTG 311, 322, MIS 311. Credit may be granted for only one of ACCTG 437 or MIS 437.

#### MIS 441 Managing Information Systems: A Senior Management Perspective

★3 (fi 6) (either term, 3-0-0). Intended as a capstone course to the MIS Major. Issues, opportunities, and problems involved in the management of information system resources in organizations. These include human resource, financial, policies, standards, and strategic alignment concerns relating to the information systems department. The role of the CIO (Chief Information Officer) will be explored as the focal point for the course. Integrative cases of information systems issues in small, medium and large organizations will be discussed. Prerequisites: MIS 311 and a minimum of one 400-level MIS course, or consent of Department. Open only to fourth year students. Credit will be granted for only one of MIS 414 or 441.

#### MIS 488 Selected Topics in Management Information Systems

★3 (fi 6) (either term, 3-0-0). This course may contain a lab component. Normally restricted to third- and fourth-year Business students. Prerequisites: MIS 311 or consent of Department. Additional prerequisites may be required.

#### MIS 490 Management Information Systems Competition Part I

★1.5 (fi 3) (either term, 0-1.5s-0). Preparation for Student Competition in Management Information Systems. Prerequisite: consent of Instructor.

#### MIS 491 Management Information Systems Competition Part II

★1.5 (fi 3) (either term, 0-1.5s-0). Completion of Student Competition in Management Information Systems. Prerequisite: MIS 490 and consent of Instructor.

#### MIS 495 Individual Research Project I

★3 (fi 6) (either term, 3-0-0). Special Study for advanced undergraduates. Prerequisites: consent of Instructor and Assistant Dean, Undergraduate Program.

#### MIS 496 Individual Research Project II

★3 (fi 6) (either term, 3-0-0). Special Study for advanced undergraduates. Prerequisites: MIS 495, consent of the Instructor and Assistant Dean, Undergraduate Program.

**MIS 497 Individual Research Project III**

★3 (*fi 6*) (either term, 3-0-0). Special Study for advanced undergraduates. Prerequisites: MIS 496, consent of the Instructor and Assistant Dean, Undergraduate Program.

**Graduate Courses****MIS 612 Managerial Support Systems**

★3 (*fi 6*) (either term, 3-0-0). Provides students with an understanding of the interaction between decision-making and technology within organizational contexts. Within the context of decision support systems (DSS), focus is on four key components: 1) the technology; 2) the broader context, including the decision-making styles which exist at the organizational, group and individual levels; 3) the design and development of DSS; 4) the effectiveness of DSS to support decision-making processes, including issues of implementation and evaluation.

**MIS 613 Systems Analysis and Design**

★3 (*fi 6*) (either term, 3-0-0). This course examines the critical stages of the systems development process. These include the initiation, planning, analysis, design, implementation and maintenance of information systems needed to support business functions in organizations. The concepts of life cycle, requirements of definition, analysis and design methods, and computer assisted software engineering (CASE) tools are presented. Specific modeling techniques such as process models, data models and logic models are examined in detail. Hands-on experience with a high-end CASE tool is provided.

**MIS 615 Data Base Design and Administration**

★3 (*fi 6*) (either term, 3-0-2). Application of database concepts in organizations. A comprehensive introduction to the design and development of relational databases from a logical data model. The relational database access language SQL is used along with a number of key software development tools. Effective data administration techniques for enforcing integrity and security as well as enhancing performance are also discussed. Topics of special current interest include data warehousing and the object-oriented data model. Note: The lab component will be taught for ten weeks during the term.

**MIS 618 Electronic Commerce**

★3 (*fi 6*) (either term, 3-0-0). An examination of the development of electronic commerce in business across a number of different sectors. Using a process modelling approach, traditional vs. electronic business transactions are discussed in business-to-business and business-to-consumer modes; strategies for e-commerce are developed with a focus on the appropriate technical architecture to support business in an electronic marketplace. In particular, requirements of payment systems, and issues of security and privacy are discussed as key considerations in implementation. The course uses software development tools in the implementation of these electronic commerce strategies.

**MIS 624 IT/IS Project Management**

★3 (*fi 6*) (either term, 3-0-0). Examines information system development project management. The system development project is a multi-stage activity involving investigation and analysis, scope definition, resource analysis and estimation, timing estimation, cost estimation, scheduling, monitoring, and implementation.

**MIS 626 IT/IS Enabled Process Management**

★3 (*fi 6*) (either term, 3-0-0). Focuses on the major operational activities and tasks that have come to be called 'business processes'. Will identify and categorize key business processes, demonstrate process mapping as a method of business process analysis, and demonstrate process redesign principles as a way to better manage these processes. Will feature the role of IT in process redesign.

**MIS 637 Accounting Information Systems**

★3 (*fi 6*) (either term, 3-0-0). An introduction to the field of computerized accounting information systems in organizations from the perspective of the information system professional. Accounting information systems are typically the foundation for many other information systems in organizations. Concentrates on the design of accounting information systems in organizations and integration of accounting information systems with other functional area and management information systems as well as commonalities in the system development process for accounting and other functional area information systems.

**MIS 641 Information Systems Management**

★3 (*fi 6*) (either term, 3-0-0). Issues, opportunities, and problems involved in the management of information system resources in organizations. These include human resource, financial, policies, standards, and strategic alignment concerns relating to the information systems department. The role of the CIO (Chief Information Officer) will be explored as the focal point for the course. Integrative cases of information systems issues in small, medium and large organizations will be discussed.

**MIS 686 Selected Topics in Management Information Systems**

★3 (*fi 6*) (either term, 3-0-0). Topics dealt with in this seminar may vary from year to year and will be chosen at the discretion of the instructor.

**MIS 701 Introduction to Management Information Systems Research**

★3 (*fi 6*) (either term, 3-0-0). This course provides a general introduction to the major research fields of management information systems (MIS). As an

introductory seminar, coverage will include current and historical topics appearing in top information systems journals. Discussions will revolve around the reference disciplines and theories used in the MIS literature. Co-requisite: MGTSC 705. Prerequisite: A graduate or undergraduate course in management information systems or equivalent. Open to all doctoral students or with the written permission of the instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

**MIS 702 Advanced Research Topics in Management Information Systems**

★3 (*fi 6*) (either term, 3-0-0). This course will provide an in-depth introduction to a particular methodology or a particular setting that is relevant to research in management information systems. The topic may vary from year to year. Possible topics include applications of optimal control theory in management information systems and operations management, collaborative communication systems, and quantitative models for management information systems. The required background for students will vary depending on the topic. This course may be appropriate for some graduate students in engineering or computing science. Prerequisite: Written permission of the instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

**MIS 710 Individual Research**

★3 (*fi 6*) (either term, 3-0-0).

**231.178 Management Science, MGTSC**

Department of Finance and Statistical Analysis  
Faculty of Business

**Note:** Enrolment in all MGTSC courses is restricted to students registered in the Faculty of Business, or to students registered in specified programs that require Business courses to meet degree requirements and who have obtained prior approval of their Faculty.

**Undergraduate Courses****MGTSC 312 Probability and Statistics for Business**

★3 (*fi 6*) (either term, 3-0-1). This course deals with model building, multiple regression analysis, and related methods useful in a business environment. Microcomputer software will be utilized throughout the course, with necessary computing skills being taught as the course proceeds. However, students are expected to already possess some basic familiarity with microcomputer applications. Prerequisite: MGTSC 301 or STAT 151. Credit will be granted for only one of MGTSC 312 and STAT 252.

**MGTSC 352 Operations Management**

★3 (*fi 6*) (either term, 3-0-1). A problem-solving course which introduces the student to deterministic and stochastic models which are useful for production planning and operations management in business and government. Note: Students are expected to have basic familiarity with microcomputer applications. Prerequisite: MATH 113 and MGTSC 301 or STAT 151.

**MGTSC 404 Decision Analysis**

★3 (*fi 6*) (either term, 3-0-0). This course helps students deal systematically with decisions involving two or more parties with opposing interests. Decision trees and influence diagrams are used to model available strategies and weigh tradeoffs. Game-theoretic models for bidding, bargaining, and negotiation are examined and applied in case studies and simulations. Particular attention is paid to the effect of uncertainty and the strategic use of private information. Possible examples include labor negotiations, baseball salary arbitration, construction bidding, international boundary disputes, and environmental hazard location. Ethical and moral issues are discussed. Prerequisites: MGTSC 312, 352.

**MGTSC 405 Forecasting for Planners and Managers**

★3 (*fi 6*) (either term, 3-0-0). This course is concerned with methods used to predict the uncertain nature of business trends in an effort to help managers make better decisions and plans. Such efforts often involve the study of historical data and manipulation of these data to search for patterns that can be effectively extrapolated to produce forecasts. This is a business statistics course that covers all aspects of business forecasting where the emphasis is on intuitive concepts and applications. Topics covered include the family of exponential smoothing methods, decomposition methods, dynamic regression methods, Box-Jenkins methods and judgmental forecasting methods (e.g. the Delphi method). Because forecasting is best taught through practice, the course contains numerous real, relevant, business oriented case studies and examples that students can use to practice the application of concepts. Prerequisites: MGTSC 312, MGTSC 352.

**MGTSC 422 Simulation and Computer Modelling Techniques in Management**

★3 (*fi 6*) (either term, 3-0-0). Computer modelling of management systems in such functional areas as accounting, finance, marketing and operations. Basic concepts of deterministic and probabilistic (Monte Carlo) simulation and their applications. Microcomputer implementation of case studies using spreadsheets



particularly emphasized. Required term project. Prerequisites: MGTC 312 (or equivalent STAT course), 352; and FIN 301 or ACCTG 311.

#### **MGTC 426 Service Operations Management**

★3 (*fi 6*) (either term, 3-0-0). This course introduces tools that managers can use to increase profits from operating decisions in service businesses and other service organizations. These decisions range from strategic (where to locate, what to sell) to tactical (how to schedule employees for the coming week). The course will emphasize realistic business projects and the use of easily available software tools. Examples of topics are models to describe and reduce congestion, work force scheduling heuristics, and selected marketing models. Prerequisites: MGTC 312, 352.

#### **MGTC 431 Managerial Performance Measures**

★3 (*fi 6*) (either term, 3-0-0). The historical development and the current practice of performance measurement and evaluation in the public and private sectors. Topics include main purposes served by performance measures; uses of non-financial and financial measures within large organizations; input, throughput, output and outcome measures; measures that involve a built-in standard of comparison, which include growth rates, input-output coefficients and single factor efficiencies, output-input coefficients and single factor efficiencies, multi-factor productivity measures, and managerial accounting cost and sales variances; managerial functions and alternative ways of computing aggregate measures on a non-technical level; strategies for using performance measure and evaluation evidence in accountability agreements. Prerequisite: MGTC 312.

#### **MGTC 455 Quality Management**

★3 (*fi 6*) (either term, 3-0-0). The objective of the course is to study and understand process and product variation, interactions among product and process variables, and ultimately to take action to reduce variation. The topics covered include statistical process control, design of experiment, factorial design, Taguchi's methods and cases, and applications of quality control in management. Prerequisites: MGTC 312, 352.

#### **MGTC 461 Distribution Management**

★3 (*fi 6*) (either term, 3-0-0). This course will deal with the economically efficient distribution of goods and services from their points of creation to the customers. Topics will include strategic decisions, such as aggregate distribution plans and warehouse location, as well as operational decisions, such as selection of delivery routes and dispatching. This course has a significant microcomputer component. The potential of geographic-information-systems as a profit tool will be demonstrated. Prerequisite: MGTC 312, 352.

#### **MGTC 467 Analytical Techniques for Management Consulting**

★3 (*fi 6*) (first term, 3-0-0). This case-based course will cover the most popular analytical problem-solving techniques such as regression, simulation, and optimization. Topics will include inventory management, queueing, multiple regression, facility location, genetic algorithms, optimization on spreadsheets, capacity selection, process mapping, data analysis tools in spreadsheets, aggregate planning, and supply chain management. Guest speakers from the consulting sector will be invited to speak. Prerequisites: MGTC 352 and another 400-level MGTC or consent of Instructor.

#### **MGTC 468 Quantitative Management Consulting Project**

★3 (*fi 6*) (second term, 3-0-0). This course applies the techniques developed in MGTC 467 to a group project. The emphasis in the projects is on quantitative approaches to operational problems. Student groups will be assigned to consulting projects from businesses and other organizations in and near Edmonton. Groups will work on their projects under the supervision of the instructor(s). Prerequisites: MGTC 467 or consent of Instructor.

#### **MGTC 471 Decision Support Systems**

★3 (*fi 6*) (either term, 3-0-0). Decision support systems integrated with various management tools in a microcomputer environment. Programming language to be used is Visual Basic for Applications. Different multicriteria decision making tools such as the Analytic Hierarchy Process, Multiattribute Utility Theory, Goal Programming and Multiobjective Optimization are introduced. Students create decision support systems with graphical user interfaces that use a formal multicriteria decision-making front end as well as optimization, simulation or other appropriate engines for calculations in the background. Student projects in this implementation-oriented course will come from different areas such as employee scheduling, facility location, project/product selection and portfolio optimization. Prerequisites: MGTC 312, 352.

#### **MGTC 480 Honours Essay in Management Science**

★3 (*fi 6*) (second term, 3-0-0). Preparation of the honours essay required for students in the Management Science Honours program. Prerequisite: consent of the Department.

#### **MGTC 488 Selected Topics in Management Science**

★3 (*fi 6*) (either term, 3-0-0). Normally restricted to third- and fourth- year Business students. Prerequisites: MGTC 312, 352 or consent of Department. Additional prerequisites may be required.

#### **MGTC 490 Management Science Competition Part I**

★1.5 (*fi 3*) (either term, 0-1.5s-0). Preparation for Student Competition in Management Science. Prerequisite: consent of Instructor.

#### **MGTC 491 Management Science Competition Part II**

★1.5 (*fi 3*) (either term, 0-1.5s-0). Completion of Student Competition in Management Science. Prerequisite: MGTC 490 and consent of instructor.

#### **MGTC 495 Individual Research Project I**

★3 (*fi 6*) (either term, 3-0-0). Special study for advanced undergraduates. Prerequisites: consent of Instructor and Assistant Dean, Undergraduate Program.

#### **MGTC 496 Individual Research Project II**

★3 (*fi 6*) (either term, 3-0-0). Special Study for advanced undergraduates. Prerequisites: MGTC 495, consent of the Instructor and Assistant Dean, Undergraduate Program.

#### **MGTC 497 Individual Research Project III**

★3 (*fi 6*) (either term, 3-0-0). Special Study for advanced undergraduates. Prerequisites: MGTC 496, consent of the Instructor and Assistant Dean, Undergraduate Program.

## Graduate Courses

#### **MGTC 501 Data Analysis and Decision Making**

★3 (*fi 6*) (either term, 3-0-1). This course begins with a survey of graphical and numerical techniques available for studying and describing data. Following an introduction to probability distributions, an overview of statistical inference for means and proportions is provided. Regression, analysis of variance and decision analysis are then utilized to analyze data and support decision making. Time series models are also briefly discussed. The data and decisions analyzed throughout the course will be representative of those commonly encountered by managers. During the required lab sessions, spreadsheet analysis of data, Monte Carlo simulation and the use of software for statistical analysis will be presented. Not open to students who have completed MGTC 511 and MGTC 521.

#### **MGTC 502 Operations Management**

★3 (*fi 6*) (either term, 3-0-0). This course focuses on (1) the competitive advantage that a business unit can derive from innovative and efficient production and delivery of its goods and services and on (2) analytical approaches that are useful in understanding and improving an organization's operations. Specific modules include process diagramming and analysis; measuring and managing flow times; inventory control and optimization; supply chain coordination and operations strategy. Cases will be used to illustrate operational efficiency and its significance to the profitability of a firm. Not open to students who have MGTC 541. Prerequisite: MGTC 501.

#### **MGTC 604 Bargaining and Negotiation**

★3 (*fi 6*) (either term, 3-0-0). This course is a blend of both experiential learning and theory with the objective of making the student more effective in all types of bargaining. A study of positive theories on how to improve negotiation skills will be combined with analytical models of the game theoretic structure of bargaining. Through this mix of theories and several case studies and bargaining exercises, students will see both the opportunities for joint gain (win-win) and the constraints which can lead to inferior outcomes. Prerequisites: First year MBA core courses.

#### **MGTC 626 Service Operations Management**

★3 (*fi 6*) (either term, 3-0-0). This course introduces tools that managers can use to increase profits from operating decisions in service businesses and other service organizations. These decisions range from strategic (where to locate, what to sell) to tactical (how to schedule employees for the coming week). The course will emphasize realistic business projects and the use of easily available software tools. Examples of topics are models to describe and reduce congestion, workforce scheduling heuristics, and selected marketing models. Prerequisites: MGTC 502 or 541.

#### **MGTC 631 Managerial Performance Measures**

★3 (*fi 6*) (either term, 3-0-0). The historical development and the current practice of performance measurement and evaluation in the public and private sectors. Topics include main purposes served by performance measures; uses of non-financial and financial measures within large organizations; input, throughput, output and outcome measures; measures that involve a built-in standard of comparison, which include growth rates, input-output coefficients and single factor efficiencies, output-input coefficients and single factor efficiencies, multi-factor productivity measures, and managerial accounting cost and sales variances; managerial functions and alternative ways of computing aggregate measures on a non-technical level; strategies for using performance measure and evaluation evidence in accountability agreements. Prerequisite: MGTC 501 or 521.

#### **MGTC 632 Simulation and Computer Modelling Techniques in Management**

★3 (*fi 6*) (either term, 3-0-0). This course will discuss computer modelling of management systems in such functional areas as accounting, finance, marketing,

and production. Basic concepts of deterministic and probabilistic (Monte Carlo) simulation and their applications will also be covered. Micro computer implementations of case studies using spreadsheets will be particularly emphasized. A term project will be required. Prerequisite: MGTC 502 or 541.

#### **MGTC 655 Quality Management**

★3 (*fi 6*) (either term, 3-0-0). The objective of the course is to study and understand process and product variation, interactions among product and process variables and ultimately to take action to reduce variation. The topics covered include statistical process control, design of experiment, factorial design, Taguchi's methods and cases and applications of quality control in management. Prerequisite: MGTC 501 or 521.

#### **MGTC 671 Decision Support Systems**

★3 (*fi 6*) (either term, 3-0-0). Decision support systems integrated with various management tools in a microcomputer environment. Programming language to be used is Visual Basic for Applications. Different multicriteria decision making tools such as the Analytic Hierarchy Process, Multiattribute Utility Theory, Goal Programming and Multiobjective Optimization are introduced. Students create decision support systems with graphical user interfaces that use a formal multicriteria decision-making front end as well as optimization, simulation or other appropriate engines for calculations in the background. Student projects in this implementation-oriented course will come from different areas such as employee scheduling, facility location, project/product selection and portfolio optimization. Prerequisite: MGTC 501 or 521.

#### **MGTC 686 Selected Topics in Management Science**

★3 (*fi 6*) (either term, 3-0-0). Topics in this seminar may vary from year to year and are chosen at the discretion of the Instructor.

#### **MGTC 698 Individual Study Project in Management Science**

★3 (*fi 6*) (either term, 3-0-0).

#### **MGTC 701 Seminar in Mathematical Programming**

★3 (*fi 6*) (either term, 3-0-0). Topics from the areas of linear programming, nonlinear programming, quadratic programming, integer programming, stochastic programming, network analysis, and large-scale programming (decomposition and column generation) in a business context. Students are expected to have as background at least a one-semester introduction to linear programming and optimization. This course may be appropriate for some graduate students in engineering or computing science. Prerequisite: Written permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

#### **MGTC 702 Seminar in Decision Analysis and Game Theory**

★3 (*fi 6*) (either term, 3-0-0). Decision-making under uncertainty, analysis of competitive strategies, competitive bidding, theory of auctions, bargaining, and negotiation models. Students are expected to have as background at least a one semester introduction to probability and random variables. This course may be appropriate for some graduate students in engineering and computing science. Prerequisite: Written permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

#### **MGTC 703 Seminar on Advanced Applications of Operations Research**

★3 (*fi 6*) (either term, 3-0-0). Applications selected from areas such as transportation and distribution, energy modeling, urban services, health care, natural resource management, workforce management, and environmental management. Students are expected to have taken at least one of MGTC 701, 702, or 704 or have equivalent background. This course may be appropriate for some graduate students in engineering and computing science. Prerequisite: Written permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

#### **MGTC 705 Multivariate Data Analysis I**

★3 (*fi 6*) (either term, 3-0-0). An overview of multivariate data analysis normally taught by students in the first year of the Business PhD program. Designed to bring students to the point where they are comfortable with commonly used data analysis techniques available in most statistical software packages. Students are expected to complete exercises in data analysis and in solving proofs of the major results. Topics will include univariate analysis, bivariate analysis, multiple linear regression, and analysis of variance. It is expected that students have as background at least one semester of calculus, one semester of linear algebra, and two semesters introduction to probability, probability distributions and statistical inference. Prerequisite: Registration in Business PhD Program or written permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

#### **MGTC 706 Multivariate Data Analysis II**

★3 (*fi 6*) (either term, 3-0-0). A continuation of the overview of multivariate data analysis begun in MGTC 705. Topics include categorical data analysis, multivariate linear regression, discriminant analysis, canonical correlation, multivariate analysis of variance, principal component analysis, factor analysis, cluster analysis and logistic regression. Prerequisite: MGTC 705 or consent of Instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

#### **MGTC 707 Applied Business Analysis of Time Series and Panel Data**

★3 (*fi 6*) (either term, 3-0-0). This course is organized into two parts. Part I covers univariate and multivariate time domain models of stationary and nonstationary time series. Topics covered include univariate time series models, unit root tests, time series regression modeling, systems of regression equations, vector autoregressive models for multivariate time series and cointegration. In Part II the course introduces the issues and opportunities that arise with panel data and the main statistical techniques used for its analysis. Topics covered include fixed-effects models, random-effects models, dynamic models and limited dependent variable models. Throughout the course, the emphasis will be on how to use S-plus and Stata to estimate panel data and time series models. There is relatively less emphasis on statistical theory. Evaluation in the course is based on home work assignments and a term project. Prerequisite: MGTC 705 or equivalent.

#### **MGTC 820 Data Analysis and Modeling**

★3 (*fi 32*) (first term, 3-0-0). Developing the ability to collect information and to use information technology to analyze statistically and draw conclusions; developing computer skills and understanding research methods. Restricted to Executive MBA students only.

#### **MGTC 830 Operations Management**

★3 (*fi 32*) (second term, 3-0-0). Understanding the strategic role of operations in an enterprise and the relationship between operations and other business functions; designing, implementing and controlling an effective and efficient operating process. Restricted to Executive MBA students only.

## 231.179 Marine Science (Biological Sciences), MA SC

Department of Biological Sciences, Bamfield Marine Sciences Centre  
Faculty of Science

#### **Notes**

- (1) Courses are offered at Bamfield Marine Science Centre. Details are available from the Department of Biological Sciences.
- (2) Prerequisite for all of the following courses is consent of the Department of Biological Sciences.
- (3) Students will be expected to take a full course load of ★15 during the Fall term.
- (4) Students must also refer to the Faculty of Science, Marine Science section of the calendar for information.

### Undergraduate Courses

#### **MA SC 400 Directed Studies**

★3-6 (*variable*) (two term, 0-0-6). A course of directed studies under the supervision of a visiting professor. The study will involve a research project approved by the supervisor in the field of interest of the student, and will be designed to take maximum advantage of the laboratory and/or field opportunities offered by the Bamfield Marine Station.

#### **MA SC 401 Special Topics in Marine Biology**

★6 (*fi 12*) (two term, 0-0-6). Offered, as opportunities arise, by selected scientists who are working at the Bamfield Marine Science Centre. The course will generally be of a specialized nature and be at a level appropriate to graduate or senior undergraduate students. Credit for this course may be obtained more than once.

#### **MA SC 402 Special Topics in Marine Biology**

★3 (*fi 6*) (either term, 0-0-6). Offered, as opportunities arise, by selected scientists who are working at the Bamfield Marine Sciences Centre and are prepared to offer a course extending over a three-week period. Course will be of a specialized nature. Credit for this course may be obtained more than once.

#### **MA SC 403 Directed Studies in Marine Science**

★3-6 (*variable*) (first term, 13 weeks). Study will involve a research project approved by a supervisor in the student's field of interest, and will be designed to take maximum advantage of the laboratory and/or field opportunities. Students may arrange for a supervisor before the start of the fall semester. Advanced students may, with the permission of their university, take a ★6 directed study in lieu of MA SC 415, 425, or 437.

#### **MA SC 410 Marine Invertebrate Zoology**

★6 (*fi 12*) (two term, 0-0-6). A survey of the marine phyla, with emphasis on the benthic fauna in the vicinity of the Bamfield Marine Sciences Centre. The course includes lectures, laboratory exercises, field collection, identification, and observation. Emphasis is placed on the study of living specimens in the laboratory and in the field.

#### **MA SC 412 Biology of Fishes**

★6 (*fi 12*) (two term, 0-0-6). Classification, physiology, ecology, behavior and

zoogeography of fishes with particular emphasis on those in the marine environment of the British Columbia coast. Course will involve some field projects.

**0 MA SC 415 Structure and Function in Animals**

★3 (fi 6) (first term, 4 weeks). This course examines the form and function of invertebrates and vertebrates using a comparative approach. The subject areas include morphology and evolution, systems physiology, biomechanics, and development. The local marine and coastal fauna are used to illustrate the principles. The course includes fieldwork and a series of laboratory exercises and experiments.

**0 MA SC 420 Biodiversity of Marine Algae**

★6 (fi 12) (two term, 0-0-6). A survey of the marine algae, with emphasis on the benthic forms in the vicinity of the Bamfield Marine Sciences Centre. The course includes lectures, laboratory exercises, field collection, identification, and observation. Emphasis is placed on the study of living specimens in the laboratory and in the field.

**0 MA SC 425 Ecological Adaptations of Seaweeds**

★3 (fi 6) (first term, 4 weeks). The course explores morphological, physiological, genetic and reproductive adaptations of seaweeds to their natural and human altered environments.

**0 MA SC 430 Marine Ecology**

★6 (fi 12) (two term, 0-0-6). An analytical approach to biotic associations in the marine environment. Will be provided for study of the intertidal realm in exposed and protected areas and of beaches and estuaries in the vicinity of the Bamfield Marine Sciences Centre.

**0 MA SC 437 Marine Population Ecology and Dynamics**

★3 (fi 6) (first term, 4 weeks). An analytical approach to the study of marine ecology and marine populations. Intertidal and subtidal communities will be examined, with emphasis on the biota of the Barkley Sound region.

**0 MA SC 440 Biology of Marine Birds**

★6 (fi 12) (two term, 0-0-6). A study of the interrelationship of birds and the marine environment. Lectures will emphasize the systematics and ecological relationships, behavior, life histories, movements and conservations of marine birds. Census techniques and methods of studying marine birds in the field will be treated as we observe seabirds and marine associated birds in the Barkley Sound region. Seabird identification, classification, morphology, plumages and moult will be examined in the laboratory.

**0 MA SC 445 Biology of Marine Mammals**

★6 (fi 12) (two term, 0-0-6). A survey course covering systematics and distribution of marine mammals, their sensory capabilities and physiology, with special emphasis on the Cetacea. The course includes lectures, laboratory exercises, field trips and an independent field study.

**0 MA SC 480 Seminars and Papers in Marine Science**

★3 (fi 6) (first term, 13 weeks). A series of weekly discussion groups and seminars covering current topics of interest in the marine sciences. Seminars will be presented by BMSC researchers, graduate students, visiting scientists as well as by the students themselves.

## Graduate Courses

**MA SC 500 Graduate Level Directed Studies**

★6 (fi 12) (two term, 0-0-6). A graduate level course of directed studies under the supervision of a member of the faculty. The study will involve a research project provided by the supervisor in the field of interest of the student, and will be designed to take maximum advantage of the laboratory and/or field opportunities offered at Bamfield Marine Station. May be offered over a 3-week period.

**MA SC 501 Graduate Level Special Topics**

★6 (fi 12) (two term, 0-0-6). Courses offered, as opportunities arise, by distinguished scientists who are visiting at Bamfield Marine Station. It is expected that the course will generally be of a specialized nature and will carry graduate credit.

**MA SC 502 Graduate Level Special Topics**

★3 (fi 6) (two term, 0-0-6). Courses offered as opportunities arise, by distinguished scientists who are visiting at Bamfield Marine Station and are prepared to offer a course extending over a three-week period. The course will carry graduate credit.

## 231.180 Marketing, MARK

Departments of Marketing, Business Economics, and Law  
Faculty of Business

**Note:** Enrolment in all MARK courses is restricted to students registered in the Faculty of Business, or to students registered in specified programs that require Business courses to meet degree requirements and who have obtained prior approval of their Faculty.

## Undergraduate Courses

The most current Course Listing is available on Bear Tracks.

**MARK 301 Introduction to Marketing**

★3 (fi 6) (either term, 3-0-0). Students are introduced to the marketing concept and the role of marketing within the overall business framework. The basic tools of marketing are introduced: market segmentation, positioning, product, price, distribution, and promotion, together with marketing research, consumer behavior, planning, and global marketing. A critical theme of the course is the need for the marketing mix to fit with the requirements of consumers, the competitive environment, company strengths, and community expectations. These issues are considered from strategic and tactical perspectives. Prerequisites: ECON 101 and 102, MATH 113 or equivalent.

**MARK 312 Marketing Research**

★3 (fi 6) (either term, 3-0-0). Nature and significance of marketing research. Marketing research methods, investigation and analysis of specific research problems. Prerequisite: MARK 301. Not open to students with credit in MARK 412.

**MARK 320 Consumer Behavior**

★3 (fi 6) (either term, 3-0-0). The study of the factors affecting the consumer decision process. Analysis of consumer behavior models and their application to marketing decision making, with an emphasis on empirical research. Prerequisite: MARK 301. BCom degree credit will not be granted for both MARK 320 and HECOL 320. Not open to students with credit in MARK 422 or CONS 220.

**MARK 432 Marketing Communications**

★3 (fi 6) (either term, 3-0-0). Students study basic concepts of interpersonal and mass communications. An emphasis on integrated marketing communications (IMC) which consist of advertising, personal selling, sales promotion, direct marketing, and public relations. A focus on integrating the elements which make up an IMC plan, resulting in a coherent communications strategy. Consumer motivation and the measurement of communication effectiveness are also examined. Prerequisite: MARK 301.

**MARK 442 Seminar in International Marketing**

★3 (fi 6) (either term, 3-0-0). Analysis of problems of international marketing; development of marketing strategies in light of world cultural, economic, geographic, legal and political factors. Prerequisite: MARK 301.

**MARK 450 Electronic Marketing**

★3 (fi 6) (either term, 3-0-0). Provides an in-depth understanding of the marketing aspects of electronic commerce. Expands upon the principles of marketing by focusing on those aspects that are unique in electronic marketplaces. Combines the study of pertinent theoretical concepts with a discussion of current developments in the practice of electronic marketing. In a major group project, students have the opportunity to apply the skills and knowledge acquired in the course to a real-world electronic marketing challenge. Prerequisites: MARK 301 and MIS 311.

**MARK 452 Strategic Marketing**

★3 (fi 6) (either term, 3-0-0). The objective of this course is to provide students with the analytic, planning, and communication skills to be successful marketing managers. The focus is on practical marketing planning, along with the development and implementation of marketing strategies. Course activities may include the use of marketing simulation games, case analyses, field research projects, secondary research and in-depth discussion of current literatures. The course focuses on the integration of all the conceptual areas in marketing. Prerequisite: MARK 301. Restricted to third year students who have completed MARK 312 or MARK 320, or to fourth year students.

**MARK 465 School of Retailing Internship**

★3 (fi 6) (two term, 3-0-0). Practical application of marketing and related business skills and theory to a problem or issues addressed during a period of 13 weeks of summer placement in a sponsoring retailing or services organization. The internship includes preliminary instruction and requires, under the supervision of the Faculty, the presentation of a project report to the sponsoring organization. Prerequisites: MARK 301 and consent of Department.

**MARK 466 Service Marketing**

★3 (fi 6) (either term, 3-0-0). Students are introduced to the important differences between marketing tangible products and marketing services. The unique nature of services is examined and the importance of service quality to both consumer and business to business customers, is emphasized. The marketing mix variables are discussed from the service perspective. Designing a marketing mix for service, not-for-profit and government institutions poses interesting and formidable challenges which are dealt with in terms of marketing planning, implementation and control. Trade barriers to the global marketing of services, together with other global service issues are also given attention. Prerequisite: MARK 301.

**MARK 468 Retailing and Channel Management**

★3 (fi 6) (either term, 3-0-0). Students are introduced to the activities involved in retailing goods and services to consumers and to the elements that make up effective distribution channels. Retailing topics include the evolution of retailing, store location, store image, shopping behavior, retail marketing strategies and current trends in retailing management. Channel management topics include: channel structure, designing the marketing channel, channel relationships and responsibilities, selecting channel members, and physical distribution and transportation. Effective channel management, the application of marketing



planning, and analysis of retailing and channel management are also examined  
Prerequisite: MARK 301.

#### **MARK 470 Selling and Sales Management**

★3 (fi 6) (either term, 3-0-0). The role of selling and management of the sales force in diverse modern business environments. Topics include sales strategies, sales force planning, organization and evaluation, recruiting, selection and training, leadership and motivation, sales forecasting quotas and types of compensation. Prerequisite: MARK 301.

#### **MARK 472 Product Management and Pricing**

★3 (fi 6) (either term, 3-0-0). Development, management and pricing of interrelated goods and services. New product development, managing a product portfolio, bundling of goods and services, and tailoring price and product to different segments. Prerequisites: MARK 301 and BUEC 311.

#### **MARK 488 Selected Topics in Marketing**

★3 (fi 6) (either term, 3-0-0). Normally restricted to third- and fourth- year Business students. Prerequisites: MARK 301 or consent of Department. Additional prerequisites may be required.

#### **MARK 490 Marketing Competition Part I**

★1.5 (fi 3) (either term, 0-1.5s-0). Preparation for Student Competition in Marketing. Prerequisite: consent of Instructor.

#### **MARK 491 Marketing Competition Part II**

★1.5 (fi 3) (either term, 0-1.5s-0). Completion of Student Competition in Marketing. Prerequisite: MARK 490 and consent of Instructor.

#### **MARK 495 Individual Research Project I**

★3 (fi 6) (either term, 3-0-0). Special study for advanced undergraduates. Prerequisites: MARK 312 or equivalent, consent of Instructor and Associate Dean Undergraduate Program.

#### **MARK 496 Individual Research Project II**

★3 (fi 6) (either term, 3-0-0). Special Study for advanced undergraduates. Prerequisites: MARK 495, consent of the Instructor and Assistant Dean, Undergraduate Program.

#### **MARK 497 Individual Research Project III**

★3 (fi 6) (either term, 3-0-0). Special Study for advanced undergraduates. Prerequisites: MARK 496, consent of the Instructor and Assistant Dean, Undergraduate Program.

## Graduate Courses

#### **MARK 502 Principles of Marketing Management**

★3 (fi 6) (either term, 3-0-0). This course commences with an examination of core marketing concepts, including strategic marketing planning, segmentation and the marketing mix (product, price, place and promotion) and the integration of these concepts into a marketing plan. Specific focus is then provided to developing pragmatic skills regarding marketing effectiveness.

#### **MARK 586 Selected Topics in Marketing**

★1.5 (fi 3) (either term, 3-0-0). Topics in this seminar may vary from year to year and are chosen at the discretion of the Instructor.

#### **MARK 612 Marketing Research**

★3 (fi 6) (either term, 3-0-0). Provides an examination of marketing research methodologies emphasizing the translation of marketing problems into researchable form, research design, data gathering, data analysis, and implementation of research results. Prerequisite: MARK 502. Credit will not be given for both MARK 612 and 620.

#### **MARK 624 Consumer Behaviour**

★3 (fi 6) (either term, 3-0-0). Individual and group influences on consumer decision-making and their implications for marketing strategy. Individual influences examined include personality, information processing strategies, and attitude change. Group influences include reference groups such as family, social class, culture, and sub-culture. Prerequisite: MARK 502. Credit will not be given for both MARK 624 and 620.

#### **MARK 630 Marketing Communications and Branding**

★3 (fi 6) (either term, 3-0-0). This course introduces the student to the management of marketing communications with an emphasis on the evolving nature of marketing communication tools. It also introduces the techniques used in the creation, nurturing and leveraging of brand assets in an environment where consumer and cultural influences strongly interact with strategic marketing decisions to impact brand meaning and value. Prerequisite: MARK 502.

#### **MARK 644 International Marketing**

★3 (fi 6) (either term, 3-0-0). Topics in international marketing, including the importance of international marketing to Canadian business, comparative marketing systems, evaluation of socioeconomic influences on international marketing, and marketing strategies as they relate to firm size. Prerequisite: MARK 502.

#### **MARK 650 Marketing in Electronic Environments**

★3 (fi 6) (either term, 3-0-0). This course equips students with a conceptual understanding of the marketing-related issues that are of importance to e-commerce

managers and a set of skills that will enable them to develop successful marketing strategies for digital marketplaces. In a major group project, students have the opportunity to apply the knowledge and skills acquired in the course to a real-world electronic-marketing challenge. Prerequisite: MARK 502.

#### **MARK 660 Retail Marketing Management**

★3 (fi 6) (either term, 3-0-0). This course introduces students to the critical concepts, strategies and tactics in retail marketing today. Building from a general framework for understanding retail marketing strategy, the course examines competition, geodemographic segmentation, multi-channel retailing, retail buying and category management, personalization and customization, pricing dynamics, customer lifetime value, customer relationship management, and retention and relationship marketing. Prerequisite: MARK 502.

#### **MARK 664 Product Management and Pricing**

★3 (fi 6) (either term, 3-0-0). Development, management and pricing of interrelated goods and services. New product development, pricing strategies for new products, managing a product portfolio, bundling of goods and services and pricing the bundles, and tailoring price and product to different segments. Prerequisites: MARK 502, and BUEC 502 or 503.

#### **MARK 686 Selected Topics in Marketing**

★3 (fi 6) (either term, 3-0-0).

#### **MARK 710 Research Methodology in Marketing**

★3 (fi 6) (either term, 3-0-0). The nature of scientific inquiry and its relevance and application to research in marketing. The development and testing of marketing theory. Marketing measurement methodology. Prerequisites: Registration in the Business PhD Program or permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students. Students may not receive credit for both MARK 701 and 710.

#### **MARK 720 Buyer Behaviour**

★3 (fi 6) (either term, 3-0-0). This course is concerned with the impact of environmental factors on consumers, as well as the impact of marketing on society. In particular, this course will provide an intensive examination of external factors including situational variables and sociocultural influences on consumer behaviour. Macro issues relevant to the impact of marketing on society will also be considered, with a focus on issues relevant to mass communication and public policy. Prerequisites: Registration in the Business PhD Program or permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

#### **MARK 725 Human Judgment And Decision Making**

★3 (fi 6) (either term, 3-0-0). This course will familiarize students with theories of cognitive information processing and affective processes as they relate to consumer judgments and decisions. More specifically, the cognitive component of this course will provide an intensive examination of memory, perception, attitude formation, and behavioural decision theory. The affect component of the course will deal with factors influencing affect formation as well as the impact of affect on attitudes and decision making. Research methods underlying each of these streams of information will be examined. Prerequisites: Registration in the Business PhD Program or permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

#### **MARK 740 Marketing Models**

★3 (fi 6) (either term, 3-0-0). This course describes theoretical and empirical models used to analyze marketing management issues in the areas of product introduction and positioning, pricing, advertising, and distribution channels. The theoretical structure in the course comes from microeconomics of firm and consumer decision making, with special consideration of competitive issues analyzed with game theory and some applications of control theory. The empirical work draws from conjoint analysis, choice modeling, and multivariate techniques. Prerequisites: Registration in the Business PhD Program or permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

#### **MARK 750 Marketing Theory**

★3 (fi 6) (either term, 3-0-0). Recent and classic contributions to marketing theory development. The course addresses conceptual development and current practice in marketing decision-making. Topics critically examined include marketing orientation, competitive interaction, product development and introduction, channel relationship management, customer relationship management, advertising and promotion, pricing and revenues, and sales, service and quality. Prerequisites: Registration in the Business PhD Program or permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

#### **MARK 797 Current Research in Marketing**

★3 (fi 6) (either term, 3-0-0). An overview of recently published research in marketing with an emphasis on the research interests of enrolled students not adequately covered in other marketing doctoral courses. Prerequisites: Registration in the Business PhD Program or permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

#### **MARK 799 Individual Research**

★3 (fi 6) (either term, 3-0-0). Special studies for advanced students. Prerequisites:

Registration in the Business PhD Program or permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

### MARK 830 Marketing

★3 (fi 6) (second term, 3-0-0). Understanding the role of marketing in determining the direction of an organization; the customer-focused organization; opportunity identification; forecasting demand; marketing segmentation; market planning, and implementation. Restricted to executive MBA students only.

## 231.181 Master of Internetworking, MINT

Departments of Computing Science and Electrical and Computer Engineering  
Faculty of Science

### Graduate Courses

#### MINT 700 The Physical Layer

★3 (fi 6) (variable, 36 hours). Communication media, including copper, optical fiber and wireless. Modulation and coding standards. Framing. Error control techniques. MAN and WAN physical layers, including PDH, SONET/SDH, aATM, cable modems, xDSL, AMPS, GSM, GPRS, etc. Offered jointly by the Department of Electrical and Computer Engineering and the Department of Computing Science.

#### MINT 702 Data Communication Protocols

★3 (fi 6) (variable, 36 hours). Structure of communication protocols, with an emphasis on the data link layer. SDLC and HDLC. Medium access control techniques. AAA. Local area, metropolitan area and wireless standards: Ethernet, 802.11 and Bluetooth. Offered jointly by the Department of Electrical and Computer Engineering and the Department of Computing Science.

#### MINT 704 The Internet Protocol Suite

★3 (fi 6) (variable, 36 hours). Rationale and organization of the Internet protocols. IP, UDP, TCP, ICMP, ARP, RARP, Mobile-IP. Addressing and routing; intradomain routing protocols. Transport layer congestion control and flow control. IP over everything. Rationale and organization of the Internet protocols. IP, UDP, TCP, ICMP, ARP, RARP, Mobile-IP. Addressing and routing; intradomain routing protocols. Transport layer congestion control and flow control. IP over everything. Offered jointly by the Department of Electrical and Computer Engineering and the Department of Computing Science.

#### MINT 706 Internet Application and Programming

★3 (fi 6) (variable, 36 hours). Concepts of Internet Applications. Sockets, client-server programming, proxies and gateways, performance, application programming, basic security, example application protocols: SMTP, HTTP, and how to implement them. Possible source code inspection exercises covering wget/HTTP. Offered jointly by the Department of Electrical and Computer Engineering and the Department of Computing Science.

#### MINT 708 Internet Laboratory

★3 (fi 6) (variable, 36 hours). Demonstration of network principles. Practical aspects of network design and implementations. Offered jointly by the Department of Electrical and Computer Engineering and the Department of Computing Science.

#### MINT 709 Internet Project

★6 (fi 12) (variable, 60 hours). Capstone project involving the design or analysis of a significant internetwork or internetworking component. Offered jointly by the Department of Electrical and Computer Engineering and the Department of Computing Science.

#### MINT 712 Internet Security

★3 (fi 6) (variable, 36 hours). Security: vulnerabilities of Internet protocols, penetration techniques and defenses, intrusion detection systems. Cryptography: Public and private key cryptography, key negotiation, certificates. E-commerce security standards for both protocols and hosts. Offered jointly by the Department of Electrical and Computer Engineering and the Department of Computing Science.

#### MINT 714 High Performance Server Programming

★3 (fi 6) (variable, 36 hours). Server architecture. Multi-threaded and high-performance servers. Distributed databases. Transaction consistency. Load sharing and balancing. High availability, RAID. Case studies. Offered jointly by the Department of Electrical and Computer Engineering and the Department of Computing Science.

#### MINT 715 Advanced Routing and Network Management

★3 (fi 6) (variable, 36 hours). Distance vector, link state and hybrid protocols. Intradomain vs. inter-domain protocols. Multi-protocol routing and route redistribution. Network management protocols and procedures: autodiscovery, performance monitoring, fault isolation. Offered by the Department of Electrical and Computer Engineering and the Department of Computing Science.

#### MINT 717 Internet Project Management

★3 (fi 6) (variable, 36 hours). Phases of implementing a new network. Phases of a network hardware or software upgrade. Risk management. Management tools including PERT, CPM, etc. Process mapping. Offered jointly by the Department of Electrical and Computer Engineering and the Department of Computing Science.

#### MINT 718 Optical Network Engineering

★3 (fi 6) (variable, 36 hours). MINT 718 addresses the theory and practice of high-capacity optical access and transport networks. Experience is gained designing and characterizing optical links, configuring various forms of transport protection and restoration (linear 1+1, UPSR and BLSR rings), and designing gigabit passive optical (GPON) access networks. Offered jointly by the Department of Electrical and Computer Engineering and the Department of Computing Science.

#### MINT 719 Special Topics in Internet Technology

★3 (fi 6) (variable, 36 hours). Intended to enable individual students to study special internet topics under the supervision of a faculty member. Approval must be obtained from the program coordinator. Offered jointly by the Department of Electrical and Computer Engineering and the Department of Computing Science.

## 231.182 Materials Engineering, MAT E

Department of Chemical and Materials Engineering  
Faculty of Engineering

The following courses were renumbered effective 2007 - 2008:

Old	New	Old	New
MAT E 251	MAT E 201	MAT E 441	MAT E 468
MAT E 252	MAT E 202	MAT E 442	MAT E 469
MAT E 440	MAT E 470	MAT E 480	MAT E 471

### Undergraduate Courses

#### MAT E 201 Materials Science I

★3 (fi 6) (either term or Spring/Summer, 3-0-0). An introduction to the science of materials from the standpoint of the relationships between atomic, molecular and crystal structure to material properties. Atomic bonding, crystal structure and crystal imperfections. Structures of metallic, non-metallic and composite materials. Diffusion, electrochemical and corrosion properties; strengthening mechanisms, mechanical properties and failure; electrical conductors, semiconductors, and dielectrics; thermal, magnetic, and optical properties. Credit may not be obtained in this course if previous credit has been obtained in MAT E 251 or 353. Prerequisite: CHEM 105 or consent of Department.

#### MAT E 202 Materials Science II

★3.8 (fi 6) (either term or Spring/Summer, 3-0-3/2). An introduction to the science of materials relating their mechanical, thermal, electronic and chemical properties to atomic, molecular and crystal structure. Ceramic and metallic crystals, glasses, polymers and composite materials. Multi-phase materials, strengthening processes. Laboratories include mechanical properties of metals and polymers, microstructure, heat treatment of steel, corrosion. Credit may not be obtained in this course if previous credit has been obtained in MATE E 252. Prerequisite: CHEM 105 or consent of Department.

#### MAT E 211 Characterization of Materials

★3.9 (fi 6) (second term, 3-1s-3/4). Techniques for characterization of materials. Elements of crystallography. Optical microscopy and image analysis, diffraction techniques, electron microscopy, surface science techniques, wet chemical techniques, non-destructive characterization, emerging techniques. Prerequisite: MAT E 202 or consent of Department.

#### MAT E 221 Powder Fabrication and Processing

★3.5 (fi 6) (second term, 3-1s-0). Characteristics of particles including size, shape, textures, surface area and surface charges, etc. Top-down and bottom-up techniques of particle synthesis. Powder fabrication techniques for minerals, metals and ceramics. Particle separation techniques based on size and type. Stability of particulate dispersions, Consolidation. Prerequisite: MAT E 202 or consent of Department.

#### MAT E 301 Materials Engineering Thermodynamics

★3 (fi 6) (first term, 3-0-0). Fundamentals of thermodynamics in materials engineering. Review of thermodynamic functions. First, second and third laws. Reaction equilibria, stability diagrams. Solution thermodynamics applied to materials processes. Phase relations, free energy-composition diagrams. Electrochemistry. Experimental methods and estimation of thermodynamic data. Credit may not be obtained in this course if previous credit has been obtained in MAT E 340. Prerequisite: CH E 243.

#### MAT E 335 Phase Transformations I

★3.5 (fi 6) (first term, 3-1s-0). Solid state diffusion, diffusion mechanisms and mathematics of diffusion. Binary and ternary phase diagrams. Solid state transformations are addressed with applications in ceramics, metals and alloys. Prerequisite: MAT E 211, Corequisite: MAT E 301.

**MAT E 336 Phase Transformations II**

★3.5 (fi 6) (second term, 3-1s-0). Thermodynamics and kinetics of solid-vapour and solid-liquid transformations in materials science and engineering. Applications to chemical vapor deposition (CVD), physical vapor deposition (PVD), sputtering and solidification processing. Prerequisite: MAT E 335.

**MAT E 341 Applied Electrochemistry**

★3.5 (fi 6) (second term, 3-1s-0). Electrochemical reactions, equilibrium electrode potentials, cell potentials and Pourbaix diagrams. Electrochemical reaction kinetics, Butler-Volmer Model, polarization and Tafel equations. Metal recovery from solutions, electroplating, electroless plating. Corrosion. Batteries, fuel cells. Prerequisite: MAT E 301 or CH E 343.

**MAT E 345 Corrosion and Oxidation**

★3 (fi 6) (either term, 3-0-0). Electrochemical thermodynamics and construction of Pourbaix Diagrams, electrochemical kinetics including mixed potential theory, origin and electrochemical manifestation of passivity, galvanic corrosion and pitting corrosion; NACE standards. Prerequisite: MAT E 201 or 202. Credit may not be obtained in this course if previous credit has been obtained in MAT E 341 and 474.

**MAT E 351 Mechanical Properties**

★3.5 (fi 6) (second term, 3-1s-0). Stress/strain relationships and tensile testing. Dislocation theory, twinning and plastic deformation. Strengthening mechanisms. Fundamentals of fracture, failure mechanisms, fracture mechanics and fracture testing. Prerequisites: CIV E 270, MAT E 211, and MAT E 335.

**MAT E 361 Materials Engineering Laboratory I**

★2.3 (fi 4) (first term, 1-1s-3/2). Experimental data processing and report writing. Materials characterization. Materials testing. Particle size reduction and separation. Prerequisites: MAT E 211, 221. Corequisite: STAT 235.

**MAT E 362 Materials Engineering Laboratory II**

★2.3 (fi 4) (second term, 1-1s-3/2). Technical report writing. Advanced materials characterization and testing. Stability of particulate dispersions. Prerequisites: MAT E 361.

**MAT E 461 Materials Engineering Laboratory III**

★3.5 (fi 4) (second term, 1-1s-4). Advanced technical report writing. Integration of materials characterization and testing techniques for problem solving. Integration of materials processing techniques for process development. Prerequisite: MAT E 362.

**MAT E 464 Materials Process Engineering Design**

★4.5 (fi 6) (first term, 3-0-3). Engineering design concepts in materials processing. Cost estimation. Project planning and scheduling. Plant safety and hazards analysis. Selected project design examples. Credit may not be obtained in this course if previous credit has been obtained in MAT E 365. Prerequisites: CME 265 and MAT E 301. Corequisites: CH E 314 and ENG M 310 or 401.

**MAT E 465 Materials Design Project**

★4 (fi 6) (either term, 2-1s-3). Team or individual materials design projects. Selection and optimization of physical/mechanical properties and fabrication processes for chosen components or structures. Credit may not be obtained in this course if previous credit has been obtained in MAT E 443. Prerequisites: MAT E 336, 341, and 351.

**MAT E 466 Special Topics in Materials Engineering**

★3 (fi 6) (either term, 3-0-0). An advanced treatment of selected Materials Engineering topics of current interest. Prerequisite: Consent of Department.

**MAT E 468 Materials Research Project I**

★2 (fi 2) (either term, 0-0-4). Research on current topics in materials engineering including structure, properties, processing or mineral processing. Literature survey on a specific topic and submission of a detailed research proposal. Credit may not be obtained in this course if previous credit has been obtained in MAT E 441. Requires a minimum GPA of 2.7 and consent of instructor. Note: In order to obtain degree credits, credits in both MAT E 468 and 469 must be obtained.

**MAT E 469 Materials Research Project II**

★4.5 (fi 6) (either term, 0-0-9). Execute research according to research proposal prepared in MAT E 458. Write research report. Credit may not be obtained in this course if previous credit has been obtained in MAT E 442. Prerequisite: MAT E 468. Note: In order to obtain degree credits, credits in both MAT E 468 and MAT E 469 must be obtained.

**MAT E 470 Process Dynamics**

★3.5 (fi 6) (either term, 3-1s-0). The study of diffusion, mass transfer and reaction kinetics in materials process engineering. The fundamental equations governing mass transfer are applied to study the rate of metallurgical processes. The use of dimensional analysis in scale-up of reactors and mixing in batch and continuous processes is also presented. Credit may not be obtained in this course if previous credit has been obtained in MAT E 440. Prerequisites: MAT E 301 and CH E 312. Corequisite: CH E 314.

**MAT E 471 Ceramics**

★3 (fi 6) (first term, 3-0-0). Structure, processing, characterization, properties and application of ceramic materials and glass. Ceramic raw materials. Crystal

chemistry and physics. Glassy state. Crystal defects, nonstoichiometry, diffusion, phase diagrams. Powder preparation, ceramic fabrication. Characterization of ceramic powders and components. Thermal, mechanical and electrical properties. Traditional and recent applications. Credit may not be obtained in this course if previous credit has been obtained in MAT E 480. Prerequisites: MAT E 221, 341 or consent of Instructor.

**MAT E 473 Shaping and Treating of Materials**

★3.5 (fi 6) (either term, 3-1s-0). Heat treating of metals and alloys, annealing, age hardening, steel processing and sintering. Forming processes. Machining, Joining (welding, brazing and soldering). Polymer and ceramic processing. Prerequisites: MAT E 336 and 351.

**MAT E 474 Performance of Materials**

★3.5 (fi 6) (either term, 3-1s-0). Behaviour of materials in service, such as corrosion and oxidation, wear and tribology, failure analysis and surface engineering. Case studies will be used to illustrate principles. Prerequisites: MAT E 336 and 341.

**MAT E 476 Microalloyed Steels**

★3 (fi 6) (second term, 3-0-0). The physical metallurgy and processing of microalloyed steels and the associated microstructure/processing/property relationship. Usage of microalloyed steels in pipelines including design, forming and welding. Credit cannot be obtained in this course if previous credit has been obtained in MAT E 489. Prerequisite: consent of Instructor.

**MAT E 490 Introduction to Nanotechnology**

★3 (fi 6) (either term, 3-0-0). Nano dimensions; band theory; Fermi Dirac statistics; energy diagrams.

**MAT E 491 Functional Properties**

★3.5 (fi 6) (first term, 3-1s-0). Band theory of solids. Dielectric materials, insulators, capacitance, piezoelectrics and pyroelectrics, electro-optical ceramics, ionic conductors. Semiconductors, doping, p/n junctions. Superconductivity, low and high TC materials, processing. Shape memory alloys. Magnetic and optical properties. Property measurement. Prerequisite: MAT E 335.

**MAT E 494 Nanostructured Materials**

★4.3 (fi 6) (second term, 3-1s-3/2). Types of materials and scaling. Ultrafine powders and comminution. Nanocomposites. Thin films and coatings. MEMS. Fullerenes and nanotubes. Processing, sol-gel, vacuum deposition, self-assembly, consolidation. Properties and characterization. Prerequisites: MAT E 201 or 202 and CH E 343 or MAT E 301 or MAT E 340.

**MAT E 495 Nanomaterials and Biomedical Applications**

★3.5 (fi 6) (either term, 3-1s-0). Survey of nanostructured materials, including processing techniques, properties (mechanical, physical and chemical), characterization, and characterization tools. Introduction to biomedical applications of nanomaterials for diagnosis, therapy and medical implants. Credit may not be obtained in this course if previous credit has been obtained in MAT E 458. Prerequisite: CH E 243 or equivalent, or consent of instructor

**Graduate Courses****MAT E 601 Research Techniques in Materials Engineering**

★3.5 (fi 6) (either term, 2-0-3). Statistical analysis, electron diffraction, crystal growth, diffuse scattering of x-rays, electron emission, high speed strain measurements, internal friction and radioactive tracers. Zone refining, high pressure and vacuum processes.

**MAT E 615 Quality Control of Weldments**

★3.8 (fi 6) (either term, 3-0-3/2). Quality assurance schemes and audits; destructive and non-destructive testing methods; fabrication code requirements and fitness-for-purpose criteria; welding procedures; statistical methods; case studies. Prerequisites: MAT E 610 and 611 or consent of Instructor.

**MAT E 630 Special Topics in Process Metallurgy**

★3 (fi 6) (either term, 3-0-0). Topics of current interest related to process metallurgy, such as process analysis, mathematical modelling and simulation, metal extraction from secondary sources, iron and steel making, physical chemistry of molten systems and production of industrial minerals.

**MAT E 633 Surface Chemistry in Minerals and Materials Processing**

★5 (fi 6) (either term, 3-1s-3). Fundamentals of surface and interfacial phenomena; physical chemistry of surfaces and interfaces; surface and interface energy and their origin; wetting, adhesion and surface forces in material processing; role and mechanisms of surfactant adsorption and self-assembly in materials engineering; techniques for surfactant adsorption and self-assembly in materials engineering; techniques for surface characterization. The course includes an experimental research project of 3 hours per week. Credit cannot be obtained in this course if credit has already been obtained in MAT E 433.

**MAT E 640 Advanced Materials Thermodynamics**

★3 (fi 6) (either term, 3-0-0). Advanced topics in core fundamentals of materials thermodynamics. Thermodynamic laws, statistical thermodynamics, reaction equilibria, phase diagrams, solutions, changing standard states, electrochemistry, and thermodynamics of surfaces. Prerequisite: MAT E 301 or consent of Instructor.



**MAT E 645 Electrochemical Processes**

★3 (fi 6) (either term, 3-0-0). Aqueous, molten and solid electrolytes; thermodynamics, structure, transport properties. Applications of conductivity measurements. Electrodes: types, reactions, potential. Electrochemical cells. Applications of EMF measurements. Electrical double layer, electrode kinetics, overpotential. Chlor-alkali industry, electrometallurgy, electrolysis of water, electroplating. Electrochemical energy conversion: primary and secondary batteries, fuel cells. High temperature applications. Prerequisite: Consent of Instructor.

**MAT E 653 Stress Corrosion Cracking**

★3 (fi 6) (either term, 3-0-0). The role of corrodents, stresses and microstructure in the phenomena of stress corrosion cracking; dissolution models and mechanical models proposed as mechanisms. Stress corrosion of high-strength steels, stainless steels and the principal nonferrous metals. Stress corrosion testing and methods of preventing stress corrosion cracking. Prerequisite: MAT E 345 or consent of Instructor. Credit cannot be obtained in this course if credit has already been obtained in MAT E 455.

**MAT E 654 Electrochemical Theory of Corrosion**

★3 (fi 6) (either term, 3-0-0). Principles and applications of electrochemical corrosion theory in basic and applied research. Equilibrium thermodynamics and electrode kinetics. Passivation and breakdown of passivity. The study of galvanic corrosion; alloy evaluation. Corrosion testing methods and electrochemical measurement of corrosion rates. Prerequisite: MAT E 345 or consent of Instructor.

**MAT E 660 Crystallography and Diffraction in Materials Science**

★3 (fi 6) (either term, 3-0-0). Advanced concepts of geometric crystallography and the crystal structure of materials, the advanced theory of X-ray diffraction and the advanced experimental practice of X-ray diffraction methods of materials analysis. This course will concentrate on methods and techniques that are useful for the analysis of metals, ceramics, polymers, and semiconductors. Prerequisite: Consent of Instructor.

**MAT E 662 Fracture of Materials**

★3 (fi 6) (either term, 3-0-0). Theoretical strength of solids, Griffith crack theory, mechanisms of brittle and ductile fracture, the ductile to brittle transition, fatigue and creep fracture, environmental effects on fracture. Prerequisites: MAT E 358 or consent of Instructor. Credit cannot be obtained in this course if credit has already been obtained in MAT E 462.

**MAT E 663 Wear and Protection of Engineering Materials**

★4.5 (fi 6) (either term, 3-0-3). The materials aspects of wear and tribology. Wear mechanisms, tribology behavior of materials, characterization techniques, wear protection. Prerequisite: MAT E 358 or consent of Instructor. Not open to students with credit in MAT E 463.

**MAT E 664 Diffusion and Diffusion-Controlled Processes in Metallurgy and Materials**

★3 (fi 6) (either term, 3-0-0). Fundamentals of diffusion, diffusion in dilute alloys, diffusion in a concentration gradient, diffusion in non-metals, high diffusivity paths, thermal diffusion. Applications to materials: sintering, superplasticity, creep, metal oxides and non-stoichiometry.

**MAT E 665 Materials Applications of Transmission Electron Microscopy**

★4.5 (fi 6) (either term, 3-0-3). Fundamental principles of electron scattering and of the transmission electron microscope, space group theory and application to crystal structure determination, electron diffraction theory, crystallography of precipitation and of defects, TEM imaging theory and application to materials analysis, analytical electron spectrometry. Prerequisite: Graduate student standing or consent of Instructor.

**MAT E 666 Materials Applications of Scanning Electron Microscopy**

★3 (fi 6) (either term, 3-0-0). Principles and design of the scanning electron microscope, electron beam-specimen interactions, image formation, x-ray microanalysis in the scanning electron microscope, specimen preparation, application to materials analysis. Prerequisite: Consent of Instructor.

**MAT E 673 Welding Metallurgy**

★3 (fi 6) (either term, 3-0-0). Weld thermal cycles; fusion zone solidification; phase transformations, heat affected zone phenomena; cracking during welding; ferrous and non-ferrous weldments.

**MAT E 676 Special Topics in Physical Metallurgy**

★3 (fi 6) (either term, 3-0-0). Subjects of current interest such as kinetics of heterogeneous nucleation and phase transformations in solids, grain boundary phenomena, internal friction, physics and chemistry of friction and wear.

**MAT E 680 Advanced Ceramics**

★3 (fi 6) (either term, 3-0-0). Important ceramic materials and products, processing, typical properties. Structure: binary and ternary compounds, crystalline silicates, glass. Point defects, nonstoichiometry, defect reactions, dislocations. Diffusion, electrochemical transport, examples. Thermal and mechanical properties, thermal shock resistance, electrical conduction. Applications: solid electrolytes, energy conversion systems, refractories, electronics. Prerequisites: Consent of Instructor. Credit cannot be obtained in this course if credit has already been obtained in MAT E 481.

**MAT E 689 Advanced Processing of Microalloyed Steels**

★3.5 (fi 6) (either term, 3-1s-0). Advanced processing and metallurgy of microalloyed steels for pipelines. Steelmaking, casting, microstructural development during thermomechanical processing, pipe fabrication, mechanical and chemical properties and in service performance. Prerequisites: Consent of Instructor. Not open to students with credit in MAT E 489.

**MAT E 738 Process Metallurgy**

★3 (fi 6) (either term, 3-0-0).

**MAT E 778 Physical Metallurgy**

★3 (fi 6) (either term, 3-0-0).

**MAT E 900 Directed Research**

★6 (fi 12) (variable, unassigned). An engineering project for students registered in a Master of Engineering program.

**231.183 Mathematical Physics, MA PH**

Departments of Mathematical and Statistical Sciences; Physics  
Faculty of Science

**Undergraduate Courses**

**Note:** Permission to enrol in any mathematical physics course will not normally be granted unless the stated prerequisites have been met. However, students may enrol in a mathematical physics course if their department and the course instructor agree that their background and academic standing warrant the waiver of the stated prerequisites.

**O MA PH 343 Classical Mechanics I**

★3 (fi 6) (first term, 3-0-0). Principles of mechanics; non-inertial frames; Lagrange's equations and Hamilton's principle; dynamics of oscillating systems; rigid body kinematics and dynamics; Hamiltonian methods and canonical transformations. Prerequisite: PHYS 244, MATH 215 or 317.

**O MA PH 451 Mathematical Methods of Physics I**

★3 (fi 6) (either term, 3-0-0). Application to problems in physics of method of steepest descent, Fourier and Laplace transforms; boundary-value problems, integral equations, and Green's functions. Prerequisites: MATH 311 or 411, and 337, or equivalents.

**O MA PH 468 Introduction to Relativity**

★3 (fi 6) (second term, 3-0-0). Special relativity; principle of equivalence; Einstein field equations; stationary and static fields; Schwarzschild metric, experimental tests; black holes; linearized equations; gravitational collapse; cosmology. Prerequisite: PHYS 351 or MATH 446 or equivalent.

**Graduate Courses**

**Note:** The following undergraduate courses may be taken for graduate credit: MA PH 343, 451, 468.

**231.184 Mathematics, MATH**

Department of Mathematical and Statistical Sciences  
Faculty of Science

**Notes**

- (1) MATH 100, 101, 102, 201, 209, 300, 309 are open to Engineering students only.
- (2) See Mathematical Physics (MA PH) listing for courses offered jointly by the Department of Physics and the Department of Mathematical and Statistical Sciences.
- (3) Students who might take a calculus course as part of their program at the University of Alberta are encouraged to take Math 31, or equivalent, as part of their high school program.

**Undergraduate Courses****MATH 100 Calculus I**

★4 (fi 6) (either term, 3-0-2). Review of numbers, inequalities, functions, analytic geometry; limits, continuity; derivatives and applications, Taylor polynomials; log, exp, and inverse trig functions. Integration, fundamental theorem of calculus substitution, trapezoidal and Simpson's rules. Prerequisites: Pure Mathematics 30 or Mathematics 30-1 or equivalent, and Mathematics 31. Notes: (1) This course may not be taken for credit if credit has already been obtained in MATH 113, 114, 117 or SCI 100. (2) Students in all sections of this course will write a common final examination. (3) Restricted to Engineering students. Non-Engineering students who take this course will receive ★3.0.

**MATH 101 Calculus II**

★3.5 (fi 6) (either term, 3-0-1). Area between curves, techniques of integration. Applications of integration to planar areas and lengths, volumes and masses.

First order ordinary differential equations: separable, linear, direction fields, Euler's method, applications. Infinite series, power series, Taylor expansions with remainder terms. Polar coordinates. Rectangular, spherical and cylindrical coordinates in 3-dimensional space. Parametric curves in the plane and space: graphing, arc length, curvature; normal binormal, tangent plane in 3-dimensional space. Volumes and surface areas of rotation. Prerequisite: MATH 100. Notes: (1) This course may not be taken for credit if credit has already been obtained in either MATH 115, 118 or SCI 100. (2) Students in all sections of this course will write a common final examination. (3) Restricted to Engineering students. Non-Engineering students who take this course will receive ★3.0.

#### **MATH 102 Applied Linear Algebra**

★3.5 (fi 6) (either term, 3-0-1). Vectors and matrices, solution of linear equations, equations of lines and planes, determinants, matrix algebra, orthogonality and applications (Gram-Schmidt), eigenvalues and eigenvectors and applications, complex numbers. Prerequisite or corequisite MATH 100. Notes: (1) This course may not be taken for credit if credit has already been obtained in MATH 120 or 125 or 127. (2) Students in all sections of this course will write a common final examination. (3) Restricted to Engineering students. Non-Engineering students who take this course will receive ★3.0.

#### **MATH 113 Elementary Calculus I**

★3 (fi 6) (either term, 3-0-1). Review of analytic geometry. Differentiation and integration of simple functions. Applications. Prerequisite: Pure Mathematics 30 or Mathematics 30-1 or equivalent. Students who have taken Mathematics 31 are advised to take MATH 114. See Note (3) at the beginning of the Mathematic course listings. This course may not be taken for credit if credit has already been obtained in MATH 100, 114, 117 or SCI 100.

#### **MATH 114 Elementary Calculus I**

★3 (fi 6) (either term, 3-0-0). The course description is the same as for MATH 113. Prerequisites: Pure Mathematics 30 or Mathematics 30-1, Mathematics 31 or equivalent. This course may not be taken for credit if credit has been obtained in MATH 100, 113, 117 or SCI 100.

#### **MATH 115 Elementary Calculus II**

★3 (fi 6) (either term, 3-0-0). Differentiation and integration of trigonometric, exponential and logarithmic functions. Indeterminate forms and improper integrals. Techniques of integration. Application. Prerequisite: MATH 113 or 114, or equivalent. Note: This course may not be taken for credit if credit has already been obtained in either of MATH 101, 118 or SCI 100.

#### **MATH 117 Honors Calculus I**

★3 (fi 6) (first term, 4-0-0). Functions, continuity, and the derivative. Applications of the derivative. Extended limits and L'Hospital's rule. Prerequisite: Pure Mathematics 30 and 31 or their equivalents. Notes: This course is designed for students with at least a 80 percent grade in Pure Mathematics 30 or Mathematics 30-1 and Mathematics 31. Other students may be admitted with the consent of the Department. This course may not be taken for credit if credit has already been obtained in any of MATH 100, 113, 114 or SCI 100. Engineering students will receive a weight of 4.0 units for this course.

#### **MATH 118 Honors Calculus II**

★3 (fi 6) (second term, 4-0-0). Integration and the Fundamental Theorem. Techniques and applications of integration. Derivatives and integrals of the exponential, and trigonometric functions. Introduction to infinite series. Introduction to partial derivatives. Prerequisite: MATH 117 or its equivalent. Students with MATH 113 or 114 will be admitted with the consent of Department. Note: This course may not be taken for credit if credit has already been obtained in MATH 101, 115 or SCI 100. Engineering students will receive a weight of 4.0 units for this course.

#### **MATH 120 Basic Linear Algebra I**

★3 (fi 6) (either term, 3-0-0). Systems of linear equations. Vectors in  $n$ -space, vector equations of lines and planes. Matrix algebra, inverses and invertibility. Introduction to linear transformations. Subspaces of  $n$ -space. Determinants. Introduction to eigenvalues and eigenvectors. The dot product and orthogonality. Applications in a variety of fields, numerical methods. Prerequisite: Pure Mathematics 30 or Mathematics 30-1. Notes: (1) See also course description for MATH 125. (2) This course cannot be taken for credit if credit has already been obtained in any of MATH 102, 125 or 127. (3) Students planning to transfer into Engineering should take MATH 125 rather than MATH 120. (4) May contain Alternate Delivery sections; see Section 200.

#### **MATH 125 Linear Algebra I**

★3 (fi 6) (either term, 3-0-0). Systems of linear equations. Vectors in  $n$ -space, vector equations of lines and planes. Matrix algebra, inverses and invertibility. Introduction to linear transformations. Subspaces of  $n$ -space. Determinants. Introduction to eigenvalues and eigenvectors. The dot product and orthogonality. Applications in a variety of fields, numerical methods. Prerequisites: Pure Mathematics 30 or Mathematics 30-1. Notes: (1) This course is an enriched version of the basic linear algebra course MATH 120. It covers the same basic topics as MATH 120. However, some of these basic topics will be covered in more depth than in MATH 120. Also the instructor will discuss some additional applications and/or discuss some of the applications in more depth. MATH 125 is recommended for all students with at least 80% in Pure Mathematics 30. It is also recommended for students

who plan to take further courses in algebra. (2) This course cannot be taken for credit if credit has already been obtained in MATH 102, 120 or 127.

#### **MATH 127 Honors Linear Algebra I**

★3 (fi 6) (first term, 3-0-0). Systems of linear equations; vectors in Euclidean  $n$ -space; span and linear independence in Euclidean  $n$ -space; dot and cross product; orthogonality; lines and planes; matrix arithmetic; determinants; introduction to eigenvectors and eigenvalues; introduction to linear transformations; complex numbers; vector space axioms; subspaces and quotients. Prerequisite: Pure Mathematics 30 or Mathematics 30-1. Note: This course may not be taken for credit if credit has already been obtained for Math 102, 120 or 125.

#### **MATH 153 Elementary Theory of Interest**

★3 (fi 6) (either term, 3-0-0). Simple and compound interest, simple and general annuities certain; variable annuities and perpetuities, amortization schedules, sinking funds, applications. Prerequisite: Pure Mathematics 30 or Mathematics 30-1. Notes: (1) This course may not be taken for credit if credit has already been obtained in MATH 253. (2) May not be used for credit in any Honors or Specialization degrees offered by the Department of Mathematical and Statistical Sciences.

#### **MATH 160 Higher Arithmetic**

★3 (fi 6) (either term, 3-0-0). Elementary Number Theory, Numeration Systems, Number Systems and Elementary Probability Theory. Math Fair. Prerequisite: Pure Mathematics 30 or Mathematics 30-1 or consent of Department. Note: This course is restricted to Elementary Education students.

#### **MATH 164 Higher Algebra**

★3 (fi 6) (either term, 3-0-0). Polynomial functions, factorization, theory of equations, inequalities, convexity and concavity, extremal problems, additional topics. Restricted to students in Open Studies as part of the EPSB Teacher Upgrade Program.

#### **MATH 201 Differential Equations**

★3.5 (fi 6) (either term or Spring/Summer, 3-0-1). First-order equations; second-order linear equations: reduction of order, variation of parameters; Laplace transform; linear systems; power series; solution by series; separation of variables for PDEs. Prerequisite or corequisite: MATH 209 or 214. Notes: (1) Open only to Engineering students and Science students in the following programs: Specialization Physics, Specialization Geophysics or Specialization Computing Science. (2) This course may not be taken for credit if credit has already been obtained in any of MATH 205, 334, or 336. (3) Students in all sections of this course will write a common final examination. Non-Engineering students who take this course will receive ★3.0.

#### **MATH 209 Calculus III**

★3.5 (fi 6) (either term, 3-0-1). Partial differentiation, derivatives of integrals. Multiple integration using rectangular, cylindrical, and spherical coordinates. Vector Field Theory. Prerequisite: MATH 101. Prerequisite or corequisite: MATH 102. Notes: (1) Students in all sections of this course will write a common final examination. (2) Restricted to Engineering students. Non-Engineering students who take this course will receive ★3.0.

#### **MATH 214 Intermediate Calculus I**

★3 (fi 6) (either term, 3-0-0). Infinite Series. Plane curves and polar coordinates. Three dimensional analytic geometry. Partial derivatives. This course may not be taken for credit if credit has already been obtained in MATH 209 or MATH 217. Prerequisite: MATH 115 or equivalent.

#### **MATH 215 Intermediate Calculus II**

★3 (fi 6) (second term, 3-0-0). First order and second order linear differential equations with constant coefficients. Curves, tangent vectors, arc length, integration in two and three dimensions, polar cylindrical and spherical coordinates, line and surface integrals. Green's divergence and Stokes' theorems. Note: This course may not be taken for credit if credit has already been obtained in MATH 209 or 317. Prerequisite: MATH 214 or equivalent.

#### **MATH 217 Honors Advanced Calculus I**

★3 (fi 6) (first term, 4-0-0). Axiomatic development of the real number system. Topology of  $R^n$ . Sequences, limits and continuity. Multi-variable calculus: differentiation and integration, including integration in spherical and polar coordinates. The differential and the chain rule. Taylor's Formula, maxima and minima. Introduction to vector field theory. Prerequisites: MATH 118 (or MATH 101, 115 or SCI 100 with consent of Department) and any linear algebra course. Engineering students will receive a weight of 4.0 units for this course.

#### **MATH 222 Introduction to Discrete Mathematics**

★3 (fi 6) (either term, 3-0-0). A problem-solving approach to discrete mathematics, covering secret codes, public-key codes, error-correcting codes, enumeration, recurrence relations, induction, graph theory, graph algorithms and parallel algorithms. Prerequisite: Any 100-level mathematics course or SCI 100, MATH 120, 125 or 127 recommended.

#### **MATH 225 Linear Algebra II**

★3 (fi 6) (either term, 3-0-0). Vector spaces. Inner product spaces. Examples of  $n$ -space and the space of continuous functions. Gram-Schmidt process, QR factorization of a matrix and least squares. Linear transformations, change of basis, similarity and diagonalization. Orthogonal diagonalization, quadratic forms. Applications in a variety of fields, numerical methods. Prerequisites: A 100-level

linear algebra course, and one of Mathematics 31 or a 100-level calculus course. Note: This course cannot be taken for credit if credit has already been obtained in MATH 227.

**O MATH 227 Honors Linear Algebra II**

★3 (fi 6) (second term, 3-0-0). Review of vector space axioms, subspaces and quotients; span; linear independence; Gram-Schmidt process; projections; methods of least squares; linear transformations and their matrix representations with respect to arbitrary bases; change of basis; eigenvectors and eigenvalues; triangularization and diagonalization; canonical forms (Schur, Jordan, spectral theorem). Prerequisite: MATH 127 or consent of the department. Note: This course may not be taken for credit if credit has already been obtained for MATH 225.

**O MATH 228 Algebra: Introduction to Ring Theory**

★3 (fi 6) (either term, 3-0-0). Integers. Mathematical induction. Equivalence relations. Commutative rings, including the integers mod  $n$ , complex numbers and polynomials. The Chinese remainder theorem. Fields and integral domains. Euclidean domains, principal ideal domains and unique factorization. Quotient rings and homomorphisms. Construction of finite fields. Applications such as public domain encryption, Latin squares and designs, polynomial error detecting codes, and/or addition and multiplication of large integers. Prerequisite: Any linear algebra course. Credit for MATH 228 cannot be obtained if credit for MATH 326 has been already obtained.

**O MATH 241 Geometry**

★3 (fi 6) (either term, 3-0-0). Basic Euclidean geometry, congruence, parallelism, area, and similarity. Sound axiomatic development with emphasis on problem solving. Constructions and loci, inequalities, maxima and minima, circles, isometries, and additional topics. Prerequisites: Any 100-level Mathematics course or SCI 100.

**O MATH 243 Transformation Geometry**

★3 (fi 6) (second term, 3-0-0). Transformation geometry, isometry and homothety, applications in Euclidean geometry; the algebra of transformations, the Classification Theorem, frieze patterns and wall-paper groups. Prerequisite: MATH 241

**O MATH 253 Theory of Interest**

★3 (fi 6) (either term, 3-0-0). Accumulation and amount functions, effective, nominal, simple, and compound rates, force of interest and discount, simple and general annuities certain, variable annuities and perpetuities, amortization schedules and sinking funds, bonds and other securities, applications, installment loans, depreciation, depletion, capitalized cost. Prerequisite: MATH 115 or equivalent. Corequisite: MATH 214.

**MATH 260 Topics in Mathematics**

★3 (fi 6) (second term, 3-0-0). Problem solving in different areas of mathematics. Note: This course is intended for Education students and is not open to Science students. Prerequisite: MATH 160 or teaching experience at the elementary or junior high school level.

**MATH 300 Advanced Boundary Value Problems I**

★3 (fi 6) (either term, 3-0-0). Derivation of the classical partial differential equations of applied mathematics, solutions using separation of variables. Fourier expansions and their applications to boundary value problems. Introduction to Fourier Transform. Emphasis on building an appropriate mathematical model from a physical problem, solving the mathematical problem, and carefully interpreting the mathematical results in the context of the original physical problem. Prerequisites: MATH 201 and 209 or equivalents. Notes: (1) Open only to students in Engineering, Specialization Computing Science, Specialization Physics, and Specialization Geophysics. (2) This course may not be taken for credit if credit has already been obtained in MATH 337.

**O MATH 309 Mathematical Methods for Electrical Engineers**

★3 (fi 6) (first term, 3-0-0). Complex numbers, analytic functions, Cauchy-Riemann equation, Cauchy Theorem, power series and Laurent expansions, residues, inverse Laplace transform. Complex inner product spaces, orthogonal expansions, Gram-Schmidt orthogonalization completeness, Fourier expansions applied signals, Parseval's relation and Bessel's inequality. Prerequisite MATH 209. This course may not be taken for credit if credit has already been obtained in MATH 311 or 411.

**O MATH 311 Theory of Functions of a Complex Variable**

★3 (fi 6) (either term, 3-0-0). Complex numbers. Complex series. Functions of a complex variable. Cauchy's theorem and contour integration. Residue Theorem and its applications. Prerequisite or corequisite: MATH 209 or 215.

**O MATH 314 Analysis I**

★3 (fi 6) (first term, 3-0-0). Construction of real numbers, Heine-Borel and related theorems, differentiation and Riemann integral of functions, topological concepts in metric spaces, sequences, continuous maps, contraction maps, and applications. Prerequisite: MATH 209 or 215 or equivalent.

**O MATH 317 Honors Advanced Calculus II**

★3 (fi 6) (second term, 4-0-0). Implicit function theorem. Transformations of multiple integrals. Line integrals, theorems of Green, Gauss and Stokes. Sequences and series of functions. Uniform convergence. Prerequisite: MATH 217.

**O MATH 322 Graph Theory**

★3 (fi 6) (first term, 3-0-0). Graphs, paths and cycles, trees, planarity and duality, coloring problems, digraphs, matching problems, matroid theory. Prerequisite: MATH 120 or 125 or equivalent and any 200-level MATH course. MATH 222 recommended.

**O MATH 324 Elementary Number Theory**

★3 (fi 6) (first term, 3-0-0). Divisibility, prime numbers, congruences, quadratic residues, quadratic reciprocity, arithmetic functions and diophantine equations; sums of squares. Prerequisites: MATH 228 (or 128 or 223).

**O MATH 325 Linear Algebra III**

★3 (fi 6) (second term, 3-0-0). Hermitian and unitary matrices, spectral theorem. Jordan canonical form. Cayley-Hamilton Theorem. Bilinear forms, positive-definiteness, Sylvester's Law of inertia, geometric lattices. Numerical methods. Application to discrete system evolution, matrix exponentials and differential equations. Prerequisites: MATH 225 or 227.

**O MATH 326 Rings and Modules**

★3 (fi 6) (either term, 3-0-0). Rings, fields, polynomials, algebras. Homomorphisms, ideals, quotients. Ring extensions, field extensions, construction of finite fields. Integral domains: Euclidean, principal ideal, unique factorization. Chain conditions. Introduction to modules. Modules over a principal ideal domain, finitely generated abelian groups, matrix canonical forms. Prerequisite MATH 227, or both MATH 225 and 228.

**O MATH 328 Algebra: Introduction to Group Theory**

★3 (fi 6) (either term, 3-0-0). Groups, subgroups, homomorphisms. Symmetry groups. Matrix groups. Permutations, symmetric group, Cayley's Theorem. Group actions. Cosets and Lagrange's Theorem. Normal subgroups, quotient groups, isomorphism theorems. Direct and semidirect products. Finite Abelian groups. Prerequisite: MATH 227 or 228. This course may not be taken for credit if credit has already been obtained in MATH 229.

**O MATH 334 Introduction to Differential Equations**

★3 (fi 6) (either term, 3-0-0). First order equations, linear equations of higher order. Power series solution. Laplace transform methods. Introduction to special functions. Introduction to linear systems. Prerequisites: MATH 225 or 227 and one of MATH 209, 214 or 217. Corequisite: MATH 215 or 317. Note: This course may not be taken for credit if credit has already been obtained in MATH 201.

**O MATH 337 Introduction to Partial Differential Equations**

★3 (fi 6) (second term, 3-0-0). Boundary value problems of classical Math Physics, orthogonal expansions, classical special functions. Advanced transform techniques. Note: This course may not be taken for credit if credit has already been obtained in either MATH 300 or equivalent. Prerequisite: MATH 334 or 336.

**O MATH 341 Geometry of Convex Sets**

★3 (fi 6) (second term, 3-0-0). Combinatorial geometry and topology, convex sets, sets with constant width, Helly-type problems, extremal problems. Prerequisite: MATH 120 or 125 or equivalent, MATH 222 or MATH 241.

**O MATH 343 Projective and Inversive Geometries**

★3 (fi 6) (second term, 3-0-0). Projective geometry, Poncelet-Steiner constructions, inverse geometry, Mohr-Mascheroni constructions, Principle of Duality, conic sections. Prerequisite: MATH 241.

**O MATH 347 Set Theory**

★3 (fi 6) (first term, 3-0-0). Axioms for set theory, transfinite induction, cardinal and ordinal numbers, applications. Primarily intended for students enrolled in an honors or specialization program in mathematics. Prerequisite: One of MATH 215, 217, 228, 328.

**MATH 348 Differential Geometry of Curves and Surfaces**

★3 (fi 6) (first term, 3-0-0). Frenet-Serret theory of curves in the plane and in 3-space, examples; local theory of surfaces in 3-space: first and second fundamental forms, Gauss map and Gauss curvature, geodesics and parallel transport, theorem egregium, mean curvature and minimal surfaces. Prerequisites: One of MATH 102, 125 or 127 and one of MATH 209, 215 or 217.

**O MATH 356 Introduction to Mathematical Finance I**

★3 (fi 6) (first term, 3-0-0). Simple Market Model: one-step binomial model, basic notions and assumptions. Risk-Free Assets: simple interest, zero-coupon bonds, money market account. Risky Assets: dynamic of stock prices, binomial tree model, trinomial tree model. Discrete time market model: stock and money market model, extended models. Portfolio management: risk, two securities, capital asset pricing model. Prerequisite: MATH 253 and STAT 265 or consent of the Department.

**O MATH 357 Introduction to Mathematical Finance II**

★3 (fi 6) (second term, 3-0-0). Forward and futures contracts: forward and futures prices, hedging with futures. Options: put-call parity, bounds on option prices, time value of options. Option pricing: European and American options in the binomial tree model, Black-Scholes formula. Financial engineering: hedging option positions, hedging business risk. Variable interest rates: maturity-independent yields, general term structure. Stochastic interest rates: arbitrage pricing of bonds, interest rate derivative securities. Prerequisite: MATH 356 or consent of the Department.



**MATH 363 History of Mathematics**

★3 (fi 6) (second term, 3-0-0). Topics or trends, as selected by the instructor, in ancient (including all cultures), classical or modern mathematics will be covered from an historical point of view. May be offered in alternate years. Prerequisites: MATH 101 or 115 or 118 or SCI 100, MATH 102 or 120 or 125 and any 200-level MATH course.

**MATH 371 Mathematical Modeling in the Life Sciences**

★3 (fi 6) (second term, 3-0-0). Model development, computation, and analysis for problems in the life sciences. Models include differential equations, difference equations and stochastic formulations. Model evaluation and prediction. Applications are chosen from epidemiology, ecology, population biology, physiology and medicine. Prerequisites: Ordinary Differential Equations (MATH 201 or 334), Linear Algebra (MATH 102, 120 or 125). No previous computing experience is needed.

**MATH 372 Mathematical Modelling I**

★3 (fi 6) (either term, 3-0-0). This course is designed to develop the students' problem-solving abilities along heuristic lines and to illustrate the processes of Applied Mathematics. Students will be encouraged to recognize and formulate problems in mathematical terms, solve the resulting mathematical problems and interpret the solution in real world terms. Typical problems considered include nonlinear programming, optimization problems, diffusion models. Prerequisite: MATH 120 or 125 or equivalent; MATH 215.

**MATH 373 Mathematical Programming and Optimization I**

★3 (fi 6) (first term, 3-0-0). Introduction to optimization. Problem formulation. Linear programming. The simplex method and its variants (revised Simplex method, dual simplex method). Extreme points of polyhedral sets. Theory of linear inequalities (Farkas Lemma). Complementary slackness and duality. Post-optimality analysis. Interior point methods. Applications (elementary games, transportation problems, networks, etc.). Pre- or corequisites: MATH 120 or 125 or equivalent; any 200-level MATH course.

**MATH 374 Mathematical Programming and Optimization II**

★3 (fi 6) (second term, 3-0-0). Maximizing and minimizing functions of several variables (with or without constraints). Optimality conditions (necessary, sufficient, Karush-Kuhn-Tucker conditions). Iterative methods for unconstrained optimization. Penalty methods for constrained optimization. Trust region methods. Convex sets, convex functions, convex programming and dual convex programs. Dynamic programming. Applications. Prerequisites: MATH 215 or 217 and MATH 373.

**MATH 381 Numerical Methods I**

★3 (fi 6) (either term, 3-0-1). Approximation of functions by Taylor series, Newton's formulae, Lagrange and Hermite interpolation. Splines. Orthogonal polynomials and least-squares approximation of functions. Direct and iterative methods for solving linear systems. Methods for solving non-linear equations and systems of non-linear equations. Introduction to computer programming. Prerequisite: MATH 214 or equivalent, MATH 120, 125 or equivalent. Note: Credit can be obtained for at most one of MATH 280, 381, CMPUT 340. Note: Extra classes may be held for students lacking a background in one of the major programming languages such as Fortran, C, C++ or Matlab.

**MATH 400 Industrial Internship Practicum**

★3 (fi 6) (first term, 0-3s-0). Required by all students who have just completed a Mathematical Sciences Industrial Internship Program. Must be completed during the first academic term following return to full-time studies. Note: A grade of F to A+ will be determined by the student's job performance as evaluated by the employer, by the student's performance in the completion of an internship practicum report, and by the student's ability to learn from the experience of the Internship as demonstrated in an oral presentation. Prerequisite: WKEXP 953.

**MATH 411 Honors Complex Variables**

★3 (fi 6) (first term, 3-0-0). Complex number system. Analytic functions. Cauchy's Integral theorem and formula. Applications including the maximum modulus principle, Taylor expansion and Laurent expansion. Harmonic functions. The residue theorem with applications; calculus of residues, argument principle, and Rouché's theorem. Basics of analytic continuation. Additional topics at the instructor's discretion such as: Normal families, The Riemann mapping Theorem, Picard's Theorem. Note: This course is primarily for Honors students in Mathematics or Physics. Offered in alternate years. It may be offered in intervening years if demand is sufficient. Prerequisite: MATH 314 or 317.

**MATH 414 Analysis II**

★3 (fi 6) (second term, 3-0-0). Differentiation of maps in  $R^n$ , implicit function and mapping theorems, sequences of functions, Riemann-Stieltjes integration, additional topics at the discretion of the instructor. Prerequisite: MATH 314.

**MATH 417 Honors Real Variables I**

★3 (fi 6) (first term, 3-0-0). Elements of set theory, cardinality, brief construction of real numbers.  $N$ -dimensional Lebesgue measure and Lebesgue integral. Differentiability, Riemann-Stieltjes integral and functions of bounded variation. Prerequisite: MATH 317 or equivalent.

**MATH 418 Honors Real Variables II**

★3 (fi 6) (second term, 3-0-0). Differentiation and integration. Elementary metric

space theory. Banach space. Hilbert space. Baire Category. Lp spaces. Trigonometric series. Prerequisite: MATH 417.

**MATH 421 Combinatorics**

★3 (fi 6) (second term, 3-0-0). Permutations and combinations, Binomial Theorem, Principle of Inclusion-Exclusion, recurrence relations, generating functions, orthogonal Latin squares, balanced incomplete block designs, Steiner triple systems, perfect difference sets, Boolean algebra and Finite State Machines. Prerequisites: MATH 228 (or 223 or 128); any 300-level MATH course, MATH 322 recommended.

**MATH 422 Coding Theory**

★3 (fi 6) (second term, 3-0-0). Elements of group theory, cosets, Lagrange's theorem, binary group codes, polynomials, finite field theory, error correcting codes. Prerequisites: MATH 228 (or 223, or 128), any 300-level MATH course.

**MATH 424 Algebra: Groups and Fields**

★3 (fi 6) (first term, 3-0-0). Field extensions. Groups of automorphisms of fields. Galois theory. Finite fields and applications. Solvable groups, the insolubility of the quintic equation. Ruler and compass construction. Prerequisite: MATH 328 MATH 225 recommended. Note: (1) This course cannot be taken for credit if credit has already been obtained in MATH 427 or 329.

**MATH 428 Algebra: Advanced Ring Theory**

★3 (fi 6) (second term, 3-0-0). Topics in ring theory selected by the Instructor. The topics will be chosen to illustrate the use of ring theory in another area of mathematics such as the theory of numbers, algebraic geometry, representations of groups or computational algebra. Note: This course will normally be offered in alternate years beginning in 2000-2001. Prerequisite: MATH 325 (or 427) or consent of Department.

**MATH 429 Algebra: Advanced Group Theory**

★3 (fi 6) (second term, 3-0-0). The Sylow theorems,  $p$ -groups. Groups of small order. Simple groups and composition series. Additional topics in group theory. Note This course will normally be offered in alternate years beginning in 2001-2002. Prerequisite: MATH 328.

**MATH 432 Intermediate Differential Equations**

★3 (fi 6) (second term, 3-0-0). Elementary existence and uniqueness theorems. Systems of equations, stability, perturbation theory. Introduction to numerical methods. Introduction to phase plane analysis. Prerequisite: MATH 334 or 336.

**MATH 436 Intermediate Partial Differential Equations I**

★3 (fi 6) (first term, 3-0-0). Partial differential equations as physical models. Introduction to basic generalized functions. Theory of linear and quasi-linear first-order equations: general solution, initialvalue problem, generalized solutions and propagation of singularities, characteristic surfaces, shock formation. Theory of fully nonlinear first order equations: complete solution and the initial value problem. Hamilton-Jacobi equation and its applications. Second order linear equations in  $n$  dimensions: classification, canonical form, characteristic surfaces and shock formation, initial and boundary value problem. Prerequisite: MATH 337.

**MATH 438 Intermediate Partial Differential Equations II**

★3 (fi 6) (second term, 3-0-0). Second order equations in  $n$  dimension: classification, canonical form, characteristic surfaces. Laplace equation as a representative of the elliptic equation: the mean value theorem, fundamental solutions and Green functions, the boundary value problems. Wave equation as a representative of hyperbolic equations: initial value problems, the d'Alembert formula, the method of descent, propagation of singularities, Duhamel's principle. Heat equation as a representative of parabolic equations: initial value problems. Introduction to integral transforms: Fourier, Laplace, Hankel transforms. Prerequisite: MATH 337.

**MATH 446 Tensor Analysis**

★3 (fi 6) (first term, 3-0-0). Algebra of tensors, covariant differentiation in flat space, affine geometry, Riemannian geometry, Lie differentiation, subspaces, differential forms. Prerequisites: MATH 225 (or 227); MATH 217.

**MATH 447 Elementary Topology**

★3 (fi 6) (second term, 3-0-0). Set Theory, metric spaces and general topology. Compactness, connectedness. Urysohn's Lemma and Tietze's Theorem. Baire Category Theorem. The Tychonoff Theorem. Homotopy and covering spaces. Primarily intended for third and fourth year students with a good background in Mathematics. Prerequisite: MATH 347 (or 217 and any 300-level MATH course). Offered in alternate years. It may be offered in intervening years if demand is sufficient.

**MATH 448 Elementary Differential Geometry I**

★3 (fi 6) (first term, 3-0-0). Local and global geometry of curves in 3-space; surfaces in 3-space: quadrics, surfaces of revolution, ruled surfaces, minimal surfaces, Gaussian curvature, theorema egregium, geodesics, complete surfaces, Gauss-Bonnet Theorem. Prerequisites: MATH 225 (or 121 or 227); MATH 217; any 300-level MATH course. Offered in alternate years. It may be offered in intervening years if demand is sufficient.

**MATH 472 Mathematical Modelling II**

★3 (fi 6) (second term, 3-0-0). This course is a continuation of MATH 372, but with more emphasis on individual student projects (a term paper may be required)

decided in consultation with the instructor and consideration of a student's present interest and mathematical/scientific background. Prerequisite: MATH 372.

#### **0 MATH 481 Numerical Methods II**

★3 (*fi 6*) (second term, 3-0-1). Numerical differentiation and integration. Numerical solution of initial value problems for systems of ordinary differential equations. Numerical solution of boundary value problems for ordinary and partial differential equations. Weighted residual methods and introduction to the finite element method. Prerequisite: MATH 381. Pre- or corequisite: MATH 334. Credit can be obtained for at most one of MATH 380, 481, 486.

#### **0 MATH 496 Honors Seminar**

★3 (*fi 6*) (either term, 3-0-0). This course is intended to give students experience with independent reading, and to improve their ability to present and explain mathematical ideas. The course is compulsory for all fourth year Honors students in BSc and BA Mathematics and BSc Applied Mathematics. Normally offered in alternate years. Prerequisite: MATH 317.

#### **0 MATH 497 Reading in Mathematics**

★3 (*fi 6*) (either term, 3-0-0). This course is designed to give credit to mature and able students for reading in areas not covered by courses, under the supervision of a staff member. A student, or group of students, wishing to use this course should find a staff member willing to supervise the proposed reading program. A detailed description of the material to be covered should be submitted to the Chair of the Department Honors Committee. (This should include a description of testing methods to be used.) The program will require the approval of both the Honors Committee, and the Chair of the Department. The students' mastery of the material of the course will be tested by a written or oral examination. This course may be taken in Fall or Winter and may be taken any number of times, subject always to the approval mentioned above. Prerequisite: Any 300-level MATH course.

#### **MATH 499 Research Project**

★3 (*fi 6*) (either term, 0-1s-6). This course provides students in Specialization and Honors programs an opportunity to pursue research in mathematics under the direction of a member of the Department. Course requirements include at least one oral presentation and a written final report. Students interested in taking this course should contact the course coordinator two months in advance. Credit for this course may be obtained more than once. Prerequisites: a 300-level MATH course and consent of the course coordinator.

## Graduate Courses

#### **MATH 506 Complex Variables**

★3 (*fi 6*) (either term, 3-0-0). A review and some extensions of single variable complex analysis. Complex linearity and holomorphicity in several variables, Hartog's theorem, Weierstrass preparation theorem, Riemann extension theorem, Weierstrass division theorem, analytic Nullstellensatz, implicit and inverse function theorems, complex manifolds and analytic subvarieties, meromorphic maps. Prerequisite: MATH 411.

#### **MATH 512 Algebraic Number Theory**

★3 (*fi 6*) (either term, 3-0-0). Valuations and their extensions, ramifications; integral dependence, algebraic number fields, ideals and divisors, class number. Prerequisite: MATH 427.

#### **MATH 515 Mathematical Finance I**

★3 (*fi 6*) (either term, 3-0-0). Probability tools for discrete financial analysis; Conditional probabilities/expectations. Filtrations, adapted and predictable processes. Martingales, submartingales and supermartingales in discrete-time. Doob-Meyer decomposition for supermartingales. Predictable representation. Discrete-time financial modes: Arbitrage, complete and incomplete markets. Self-financing property, value and gain processes. Valuation of contingent claims. Binomial model: Model specifications, Perfect hedging. Utility functions and consumption/investment problems. European and American options in discrete time. Futures and forward contracts in discrete time. Transition to the continuous-time framework. Prerequisite: MATH 417 or STAT 571.

#### **MATH 516 Linear Analysis**

★3 (*fi 6*) (either term, 3-0-0). Banach spaces, Hahn-Banach theorem, Banach-Steinhaus theorem, Banach open mapping and closed graph theorems in Banach spaces. Hilbert spaces and orthonormal bases. Spectral theory of compact normal operators. Examples. Basic fixed point theorems and applications. Prerequisite: MATH 418 or consent of Department.

#### **MATH 518 Functional Analysis**

★3 (*fi 6*) (either term, 3-0-0). Locally convex spaces, weak topologies and duality in Banach spaces, weak compactness in Banach spaces, structure of classical Banach spaces, local structures, infinite-dimensional geometry of Banach spaces and applications. Prerequisite: MATH 516. Corequisite: MATH 447 or consent of Department.

#### **MATH 519 Introduction to Operator Algebras**

★3 (*fi 6*) (either term, 3-0-0). Banach algebras and spectral theory, compact and Fredholm operators, the spectral theorem for bounded normal operators, operator algebras, representations of C\*-algebras, elementary von Neumann

algebra theory, and other topics. Prerequisite: MATH 516. Corequisite: MATH 447 or consent of Department.

#### **MATH 520 Mathematical Finance II**

★3 (*fi 6*) (either term, 3-0-0). Probability tools: Brownian motion, diffusion processes and continuous martingales, Ito formula and stochastic differential equation, change of probability measures. Financial markets in continuous-time: Arbitrage, completeness, self-financing strategies. Black Scholes model. Option pricing and hedging in complete markets: European and American options. Consumption-investment problem in complete markets. Introduction to models of term structure of interest rates. Prerequisite: Math 515.

#### **MATH 521 Differential Manifolds**

★3 (*fi 6*) (either term, 3-0-0). Finite dimensional manifolds/submanifolds; tangent bundle, differential, inverse, and implicit function theorems, partitions of unity; imbeddings, immersions, submersions; vector fields and associated flows; Lie derivative, Lie bracket; tensor analysis, differential forms, orientation, integration, Stokes' theorem; basics of smooth bundle theory, Riemannian metrics; notion of a Lie group with basic examples, smooth Lie group actions, principal bundles. Prerequisite: MATH 446 or 448.

#### **MATH 524 Ordinary Differential Equations IIA**

★3 (*fi 6*) (either term, 3-0-0). Existence theorems, uniqueness theorems; linear systems (basic theory); stability (basic theory); nonlinear systems (local theory); nonlinear systems (global theory); bifurcations. Prerequisite: MATH 334 or equivalent.

#### **MATH 525 Ordinary Differential Equations IIB**

★3 (*fi 6*) (either term, 3-0-0). Asymptotics; boundary value problems; Poincare-Bendixson theory. Additional material will be chosen from among the following topics at the option of the instructor: separation; dichotomies; comparison and oscillation theory; bifurcation theory; nonautonomous systems; dynamical systems; functional differential equations; contingent equations; differential equations in Banach spaces. Prerequisite: MATH 524 or equivalent.

#### **MATH 527 Intermediate Partial Differential Equations**

★3 (*fi 6*) (either term, 3-0-0). Notions; Elliptic PDE's; Parabolic PDE's; Hyperbolic PDE's; Nonlinear Integrable PDE's. Prerequisite: MATH 436 or equivalent; pre- or corequisite: MATH 518.

#### **MATH 530 Algebraic Topology**

★3 (*fi 6*) (either term, 3-0-0). Particular background from point set topology (pasting and quotienting constructions); homotopy relation between maps and spaces; fundamental group; Seifert VanKampen theorem; covering spaces. Additional topics at the discretion of the instructor. Prerequisites: MATH 227, 317 and 447 or consent of Department.

#### **MATH 535 Numerical Methods I**

★3 (*fi 6*) (first term, 3-0-0). Direct and iterative methods for solving linear systems, iterative methods for nonlinear systems, polynomial and spline interpolations, least square approximation, numerical differentiation and integration, initial value problems for ODE's (one-step, multistep methods, stiff ODE's). Prerequisite: 400-level MATH course. Students are required to have knowledge of advanced Calculus and introductory knowledge in Analysis and Linear Algebra and some computer programming. Note 1: Restricted to graduate students only. Note 2: May not be taken for credit if credit has already been obtained in MATH 381, 481 or 486 or equivalent.

#### **MATH 536 Numerical Solutions of Partial Differential Equations I**

★3 (*fi 6*) (either term, 3-0-0). Finite difference and finite element methods for boundary-value problems of elliptic equations. Numerical algorithms for large systems of linear algebraic equations: direct, classical relaxation, multigrid and preconditioned conjugate gradient methods. Algorithms for vector/parallel computers and the domain decomposition method. Prerequisites: MATH 337, 436 or equivalent and some computer programming.

#### **MATH 538 Techniques of Applied Mathematics**

★3 (*fi 6*) (either term, 3-0-0). Continuation of asymptotic expansion of integrals. Perturbation theory, asymptotic matching, perturbative eigenvalue problems. Boundary layer theory. WKB theory. Prerequisite: MATH 438.

#### **MATH 542 Fourier Analysis**

★3 (*fi 6*) (either term, 3-0-0). Review, theory and extension of Fourier series for square integrable functions; orthonormal systems, Bessel's inequality, completeness, Parseval's identity, Riesz-Fischer Theorem. Extension to Fourier series for functions in other Lebesgue classes; Fejer means, conjugate series, Dirichlet, Fejer and Poisson kernels. Norm convergence; remarks on pointwise convergence. Fourier transforms and series in several dimensions; inverse transform, Plancherel formula, Poisson Formula, maximal functions, Riesz-Thorin Theorem and applications. Elementary distribution theory; D, D', S, S' and some elementary results, Fourier transforms of tempered distributions. Examination of some earlier results with tempered distributions instead of functions and getting familiar with basic concepts. Prerequisite: MATH 418.

#### **MATH 543 Measure Theory**

★3 (*fi 6*) (either term, 3-0-0). Abstract measures. Integration. Lp spaces. Radon-

Nikodym theorem. Hahn and Lebesgue decomposition theorems. Product measures. Fubini's theorem. Prerequisite: MATH 418.

### MATH 556 Introduction to Fluid Mechanics

★3 (fi 6) (first term, 3-0-0). Fundamentals including continuum hypothesis surface tension, classical thermodynamics, and transport phenomena. Introduction to Cartesian tensors. Kinematics of flow including Lagrangian and Eulerian descriptions, streamline, path line, streak line, vorticity and circulation. Derivation of the conservation laws for mass, momentum, and energy and a detailed description of the Boussinesq approximation. Conservation laws in a rotating frame. Vortex lines and tubes, role of viscosity in vortices, Kelvin's circulation theorem, the vorticity equation in nonrotating and rotating frames. Irrotational flow including its relevance, velocity potential, sources and sinks, and flow past various shapes. Gravity waves in deep and shallow water with and without surface tension in both the linear and nonlinear contexts. Dynamic similarity and Buckingham's Pi Theorem. Prerequisites: One of MATH 311, 411 and MATH 436 or consent of Instructor.

### MATH 570 Mathematical Biology

★3 (fi 6) (either term, 3-0-0). Mathematical modeling in the biological and medical sciences. Students will learn how to apply mathematical methods and theory to a variety of different biological problems. Topics will be taken from: (i) continuous and discrete dynamical systems describing interacting and structured populations, resource management, biological control, reaction kinetics, biological oscillators and switches, the dynamics of infectious diseases and genetics and (ii) models of spatial processes in biology including random walks, pattern formation in morphogenesis and ecology, applications of traveling waves to population dynamics, epidemiology, chemical reactions, and models for neural patterns. Prerequisites: MATH 524 and 527 or consent of Instructor.

### MATH 581 Group Theory

★3 (fi 6) (either term, 3-0-0). Sylow theory, free groups, soluble/nilpotent groups; Bilinear forms, classical groups; Character theory of finite groups. Prerequisite: MATH 429 or consent of the Department.

### MATH 582 Rings and Modules

★3 (fi 6) (either term, 3-0-0). Introduction to valuations; Free and projective modules, direct sums and products; Tensor products, central simple algebras; Aeriin-Wedderburn theory; Commutative Noetherian rings including Nullstellensatz. Topics from homological algebra and category theory which may vary from year to year. Prerequisite: MATH 428 or consent of the Department.

### MATH 600 Reading in Mathematics

★3 (fi 6) (either term, 3-0-0). Students registered in this course are supervised by individual staff members in areas of interest of the staff members. Students will be allowed to take this course only in exceptional circumstances and with the permission of the Chairman of the Department. This course shall not be counted against the minimum course requirement for graduate students.

### MATH 615 Mathematical Models for the Term Structure of Interest Rates

★3 (fi 6) (either term, 3-0-0). The models of Vasicek and Cox-Ingersoll-Ross. The Heath-Jarrow-Morton model of forward rates. The short-rate process; single-factor and affine models. Estimation methods: Exponential splines. Nelson-Siegel Term Premia and the expectation hypothesis. Prerequisites: MATH 515, STAT 672.

### MATH 617 Topics in Functional Analysis I

★3 (fi 6) (either term, 3-0-0).

### MATH 618 Topics in Functional Analysis II

★3 (fi 6) (either term, 3-0-0).

### MATH 623 Topics in Differential Geometry and Mechanics

★3 (fi 6) (either term, 3-0-0).

### MATH 625 Advanced Mathematical Finance

★3 (fi 6) (either term, 3-0-0). Multi-asset complete market models with random coefficients: hedging, pricing, portfolio optimization and equilibrium. Incomplete market models: hedging, pricing and portfolio optimization. Market models with transaction costs and constraints. Prerequisites: MATH 517 or consent of the Department.

### MATH 630 Topics in Algebraic Topology

★3 (fi 6) (either term, 3-0-0).

### MATH 641 Banach Space Theory

★3 (fi 6) (either term, 3-0-0). Prerequisite: MATH 519.

### MATH 642 Abstract Harmonic Analysis

★3 (fi 6) (either term, 3-0-0). Prerequisite: MATH 519.

### MATH 643 Topics in Analysis

★3 (fi 6) (either term, 3-0-0).

### MATH 650 Seminar in Algebra

★1 (fi 2) (either term, 0-2s-0). Credit for this course may be obtained more than once.

### MATH 651 Seminar in Analysis

★1 (fi 2) (either term, 0-2s-0). Credit for this course may be obtained more than once.

### MATH 652 Seminar in Differential Equations

★1 (fi 2) (either term, 0-2s-0). Credit for this course may be obtained more than once.

### MATH 653 Seminar in Functional Analysis

★1 (fi 2) (either term, 0-2s-0). Credit for this course may be obtained more than once.

### MATH 654 Seminar in Nonlinear Waves/Fluid Mechanics

★1 (fi 2) (either term, 0-2s-0). Credit for this course may be obtained more than once.

### MATH 655 Topics in Fluid Dynamics

★3 (fi 6) (either term, 3-0-0).

### MATH 656 Seminar in Mathematical Biology

★1 (fi 2) (either term, 0-2s-0). Credit for this seminar course can be obtained more than once.

### MATH 659 Research Seminar in Mathematics

★1 (fi 2) (either term, 0-2s-0). Credit for this course may be obtained more than once.

### MATH 663 Topics in Applied Mathematics I

★3 (fi 6) (either term, 3-0-0).

### MATH 664 Topics in Applied Mathematics II

★3 (fi 6) (either term, 3-0-0).

### MATH 667 Topics in Differential Equations I

★3 (fi 6) (either term, 3-0-0).

### MATH 676 Topics in Geometry I

★3 (fi 6) (either term, 3-0-0).

### MATH 677 Topics in Geometry II

★3 (fi 6) (either term, 3-0-0).

### MATH 681 Topics in Algebra

★3 (fi 6) (either term, 3-0-0).

### MATH 682 Topics in Algebra

★3 (fi 6) (either term, 3-0-0).

### MATH 900 Directed Research Project

★6 (fi 12) (variable, unassigned). Open only to students taking the MSc thesis option in mathematics.

## 231.185 Mathématiques, MATHQ

Faculté Saint-Jean

### Cours de 1er cycle

#### MATHQ 100 Calcul élémentaire I

★3 (fi 6) (premier semestre, 3-0-2). Les nombres, inéquations, fonctions, géométrie analytique, limite, continuité, dérivées et applications, polynôme de Taylor, fonctions exponentielles et logarithmiques, fonctions trigonométriques inverses et hyperboliques, différentielle et calculs approximatifs. Intégration et théorème fondamental du calcul intégral. Méthode des trapèzes et méthode de Simpson. Préalable(s): Mathématiques pures 30 or Mathématiques 30-1, et Mathématiques 31. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MATH 117, MATHQ 113 ou 114.

#### MATHQ 101 Calcul élémentaire II

★3 (fi 6) (l'un ou l'autre semestre, 3-0-1). Techniques d'intégration et applications du calcul d'intégrales: calcul de longueurs, aires, volumes et masses, intégrales impropres, équations différentielles ordinaires d'ordre un; séparables, linéaires, méthode d'Euler, applications. Séries infinies, séries de Taylor, séries de puissances et critère de convergence d'une série. Coordonnées polaires, rectangulaires, sphériques et cylindriques dans l'espace de trois dimensions, courbes paramétriques dans le plan et l'espace. Volume et aire d'une surface de révolution. Préalable(s): MATHQ 100. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MATHQ 115 ou MATH 118.

#### MATHQ 102 Algèbre linéaire appliquée

★3 (fi 6) (deuxième semestre, 3-0-1). Vecteurs et matrices; solution d'équations linéaires; équations de lignes et de plans; déterminants; algèbre matricielle; orthogonalité de Gram-Schmidt et applications; valeurs propres, vecteurs propres et applications; nombres complexes. Préalable(s) ou concomitant(s): MATHQ 100. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MATHQ 120, MATH 125 ou 127.

#### MATHQ 113 Calcul élémentaire

★3 (fi 6) (l'un ou l'autre semestre, 3-0-1). Revue de la géométrie analytique,



différentiation et intégration des fonctions simples, applications. Préalable(s): Mathématiques pures 30 or Mathématiques 30-1, ou l'équivalent. Les étudiants ayant complété Mathématiques 31 devront normalement suivre MATHQ 100 ou MATH 114. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MATHQ 100, MATH 114 ou 117.

#### **MATHQ 115 Calcul élémentaire II**

★3 (fi 6) (deuxième semestre, 3-0-0). Différentiation et intégration des fonctions trigonométriques, exponentielles et logarithmiques. Formes indéterminées et intégrales impropres. Techniques d'intégration. Applications. Préalable(s): MATHQ 113, 114 ou l'équivalent.

#### **MATHQ 120 Algèbre linéaire I**

★3 (fi 6) (premier semestre, 3-0-0). Vecteurs et algèbre matricielle. Déterminantes. Système d'équations linéaires. Espaces vectoriels. Valeurs propres et vecteurs propres. Applications. Préalable(s): Mathématiques pures 30 or Mathématiques 30-1, ou l'équivalent. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MATH 102, 125 ou 127.

#### **MATHQ 160 Mathématiques pour enseignants**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Les concepts étudiés ont pour but d'aider l'enseignant à formuler une idée intuitive des concepts qu'il doit enseigner aux élèves. Nous aborderons les statistiques et les probabilités, les suites et les séries, les fonctions trigonométriques, les fonctions du deuxième degré, les polynômes. Note: Ce cours est réservé aux étudiants du BEd Élémentaire. Préalable(s): Mathématiques pures 30 or Mathématiques 30-1, ou l'approbation du Vice-doyen aux affaires académiques.

#### **MATHQ 201 Equations différentielles**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-1). Equations du premier ordre; équations linéaires du deuxième ordre; réduction d'ordre, variation des paramètres; transformation de Laplace; systèmes linéaires; séries de puissance; solutions par séries; séparation des variables pour les équations ou dérivées partielles. Préalable(s) ou concomitant(s): MATH 209 ou MATHQ 214. Note: Ce cours est accessible seulement aux étudiants en génie et aux étudiants en sciences dans les programmes suivants: spécialisation physique, spécialisation géophysique, spécialisation sciences informatiques, ou spécialisation géographie (météorologie). Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MATH 205, 334 ou 336.

#### **MATHQ 209 Calcul III**

★3.5 (fi 6) (l'un ou l'autre semestre, 3-0-1). Dérivées partielles, dérivées d'intégrales. Intégration multiple avec les coordonnées rectangulaires, cylindriques et sphériques. Champs de vecteurs. Préalable: MATHQ 101. Préalable ou concomitant: MATHQ 102. Note: (1) Normalement pour les étudiants de la Faculty of Engineering. (2) Les étudiants de la Faculty of Engineering auront ★3.5.

#### **MATHQ 214 Calcul intermédiaire I**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Séries infinies. Courbes planes et coordonnées polaires. Géométrie analytique à trois dimensions. Dérivées partielles. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MATHQ 209 ou MATH 217. Préalable: MATHQ 115 ou l'équivalent.

#### **MATHQ 215 Calcul intermédiaire II**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Équations différentielles d'ordre un et deux avec des coefficients constants. Courbes, vecteurs tangents, longueur d'arc, intégration en deux et trois dimensions, coordonnées polaires cylindriques et sphériques, intégrales de lignes et de surfaces. Théorèmes de Green, de Stokes et théorème de la divergence. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MATHQ 209 ou MATH 317. Préalable: MATHQ 214 ou l'équivalent.

#### **MATHQ 222 Introduction aux mathématiques discrètes**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Approche appliquée des mathématiques discrètes, couvrant les codes secrets, la cryptographie à clef publique, codes correcteurs d'erreurs, relations de récurrences, induction, théorie des graphes, algorithmes pour les graphes et algorithmes parallèles. Préalable(s): ★3 de niveau 100 en mathématiques.

#### **MATHQ 225 Algèbre linéaire II**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Espaces vectoriels. Espaces avec produit scalaire. Exemples d'espace à  $n$  dimensions, espace des fonctions continues. Procédé de Gram-Schmidt, factorisation QR, méthode des moindres carrés. Transformations linéaires, changements de base, transformations de similarité et diagonalisation. Diagonalisation orthogonale, formes quadratiques. Applications à une variété de champs, méthodes numériques. Préalable: MATHQ 120 ou MATH 125 ou un autre cours d'algèbre linéaire, Mathématiques 31 ou un autre cours de calcul. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MATH 121 ou 227.

#### **MATHQ 228 Algèbre: introduction à la théorie des anneaux**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Nombres entiers. Induction mathématique. Relations d'équivalence. Anneaux commutatifs, incluant les entiers modulo  $n$ , les nombres complexes et les polynômes. Le théorème du reste chinois. Champ et domaine intégral. Domaine euclidien, domaine idéal principal, factorisation unique. Les anneaux quotients et homomorphismes. Construction de champs

finis. Applications telles que le chiffrement dans le domaine public, carrés latin et designs, codes polynomiaux et détection d'erreur, ou addition et multiplication de grands nombres entiers. Préalable: MATHQ 120 ou MATH 125 ou autre cours d'algèbre linéaire. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MATH 128 ou 223.

#### **MATHQ 241 Géométrie**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Géométrie euclidienne de base, congruence, parallélisme, aire et similarité. Développement axiomatique avec emphase sur la résolution de problèmes. Constructions et lieux géométriques, inégalités, maxima et minima, cercles, isométries, et autres sujets. Préalable: un cours de MATHQ de niveau 100.

#### **MATHQ 243 Géométrie des transformations**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Géométrie des transformations, isométrie et homothétie, applications en géométrie euclidienne; algèbres des transformations, théorème de classification, formes de frise et groupes de pavage. Préalable: MATHQ 241.

#### **MATHQ 334 Introduction aux équations différentielles**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Équations du premier ordre, équations linéaires d'ordre élevé. Solution par séries de puissance. Méthodes de transformée de Laplace. Introduction aux fonctions spéciales. Introduction aux systèmes linéaires. Préalables: MATHQ 120 ou MATH 125 ou l'équivalent. Concomitant: MATHQ 215 ou MATH 317. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MATHQ 201 ou MATH 336.

#### **MATHQ 337 Introduction aux équations aux dérivées partielles**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Problèmes à conditions aux limites de la physique mathématique, expansions orthogonales, fonctions spéciales classiques. Techniques avancées de transformées. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MATH 300 ou l'équivalent. Préalable: MATHQ 334 ou MATHQ 336.

#### **MATHQ 363 Histoire des Mathématiques**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Les thèmes choisis par l'instructeur seront puisés dans les mathématiques anciennes (incluant toutes les cultures), classiques ou modernes et examinés d'un point de vue historique. Préalable(s): deux cours de MATHQ de niveau 100 ou l'approbation du Vice-doyen aux affaires académiques.

## 231.186 Mechanical Engineering, MEC E

Department of Mechanical Engineering  
Faculty of Engineering

### Undergraduate Courses

#### **MEC E 200 Introduction to Mechanical Engineering**

★2 (fi 4) (either term, 1-2s-0). Introduction to the profession of mechanical engineering with special emphasis of industries in Alberta, including coverage of elements of ethics, equity, concepts of sustainable development and environmental stewardship, public and worker safety and health considerations including the context of the Alberta Occupational Health and Safety Act. Selected guest speakers on design problems in mechanical engineering. Communication skills including written and oral presentations.

#### **MEC E 230 Introduction to Thermosciences**

★3.5 (fi 6) (either term, 3-1s-0). Introduction to modes of heat transfer. Onedimensional heat conduction. Heat transfer from surfaces. Introduction to fluid mechanics. Fluid properties. Fluid statics. Use of control volumes. Internal flows. Prerequisites: MATH 101, EN PH 131.

#### **MEC E 250 Engineering Mechanics II**

★3.5 (fi 6) (either term, 3-1s-0). Moments of inertia. Kinematics and kinetics of rigid body motion, energy and momentum methods, impact, mechanical vibrations. Prerequisites: ENGG 130, EN PH 131 and MATH 101. There is a consolidated exam.

#### **MEC E 260 Mechanical Design I**

★3.5 (fi 6) (either term, 2-0-3). Design morphology, analysis and design of components, computer-aided design introduction, design project. Corequisite: MEC E 265 and CIV E 270.

#### **MEC E 265 Engineering Graphics and CAD**

★3.5 (fi 6) (either term, 2-0-3). Engineering drawing and sketching, conventional drafting, computer-aided drawing in 2D and 3D, solid modelling, and computer-aided design.

#### **MEC E 300 Mechanical Measurements**

★3.5 (fi 6) (either term, 3-1s-0). Characterization and behavior of measuring systems. Statistics and analysis of measurement data; measurement techniques applied to fundamental mechanical engineering phenomena. Prerequisites: CIV E 270, E E 239, STAT 235. Corequisite: MEC E 330.

#### **MEC E 301 Mechanical Engineering Laboratory I**

★2.5 (fi 6) (either term, 1-0-3). Laboratory experiments in mechanical engineering

measurement techniques, treatment of measurement data, introduction to engineering report writing. Corequisite: MEC E 300.

#### **MEC E 330 Fluid Mechanics I**

★3.5 (*fi 6*) (either term, 3-0-1). Basic equations, hydrostatics, Bernoulli equations, momentum theories, similitude fluid metering, fluid friction, fluid friction in pipes, external flow, boundary layers. Note: Students who have taken MEC E 230 must take MEC E 331. Credit can only be obtained for one of MEC E 330 and MEC E 331. Prerequisites: MEC E 250, MATH 209. Corequisite: CH E 243.

#### **MEC E 331 Fluid Mechanics I**

★3.5 (*fi 6*) (either term, 3-0-1). External flow, boundary layers, momentum theories, similitude, fluid metering, fluid friction, fluid friction in pipes, pipe networks. Prerequisites: MEC E 230, MEC E 250, MATH 209. Corequisite: CH E 243.

#### **MEC E 340 Applied Thermodynamics**

★3.5 (*fi 6*) (either term, 3-0-1). Review of thermodynamic principles. Applications to gas compressors, vapour and gas power cycles, heat pump cycles. Availability analysis. Psychrometrics. Combustion analysis. Prerequisite: CH E 243.

#### **MEC E 350 Engineering Mechanics III**

★3.5 (*fi 6*) (either term, 3-0-1). Dynamics of rigid bodies moving in three dimensions. Spatial kinematics of rigid bodies, Euler angles, tensor of inertia and the Newton-Euler equations of motion for rigid bodies. Prerequisite: MEC E 250.

#### **MEC E 360 Mechanical Design II**

★3.8 (*fi 6*) (either term, 3-0-1.5). Design procedures, theories of failure, material selection, design for fatigue, creep and relaxation, selection of gears and bearings, development and application of computer-aided design software. Prerequisite: MEC E 260 and 265, MAT E 202 and CIV E 270.

#### **MEC E 362 Mechanics of Machines**

★3.8 (*fi 6*) (either term, 3-0-1.5). Velocities and acceleration in plane mechanisms, balancing of rotating and reciprocating machinery, gears and gear trains. Prerequisite: MEC E 250.

#### **MEC E 364 Manufacturing Processes**

★3.5 (*fi 6*) (either term, 2-0-3). Primary manufacturing processes including casting, forming, machining, powdered metallurgy and surface technology, interactions between design, materials (metals, polymers, ceramics, composites) and processes, selected field trips and laboratory activities. Prerequisite: MEC E 260.

#### **MEC E 370 Heat Transfer**

★3.5 (*fi 6*) (either term, 3-1s-0). Mechanisms of heat transfer, steady and unsteady heat conduction, numerical analysis, thermal radiation, free and forced convection, heat exchanger analysis and heat transfer with change of phase. Note: Students who have taken MEC E 230 must take MEC E 371. Credit can only be obtained for one of MEC E 370 and MEC E 371. Prerequisites: CH E 243. Corequisites: MATH 300 and MEC E 330.

#### **MEC E 371 Heat Transfer**

★3.5 (*fi 6*) (either term, 3-1s-0). Mechanisms of heat transfer, steady and unsteady heat conduction, numerical analysis, thermal radiation, free and forced convection, heat exchanger analysis and heat transfer with change of phase and mass transfer. Prerequisites: MEC E 230, CH E 243. Corequisites: MATH 300 and MEC E 331.

#### **MEC E 380 Advanced Strength of Materials I**

★3.5 (*fi 6*) (either term, 3-1s-0). Stress, strain, stress-strain relation, time-independent and time-dependent behavior, virtual work and energy theorems, deformations, indeterminate systems, matrix methods. Prerequisite: MEC E 260 and CIV E 270.

#### **MEC E 390 Numerical Methods of Mechanical Engineers**

★3.5 (*fi 6*) (either term, 3-0-1). Application of numerical methods to mechanical engineering problems; topics include sources and definitions of error, root finding, solutions of linear and non-linear systems of equations, regression, interpolaton, numerical integration and differentiation, solution of initial value and boundary value ordinary differential equations. Applications include dynamics, solid mechanics, heat transfer and fluid flow. Prerequisites: MATH 102 and 201.

#### **MEC E 403 Mechanical Engineering Laboratory II**

★2.5 (*fi 6*) (either term, 1-0-3). Selected laboratory experiments in applied mechanics and thermosciences. Note: Credit cannot be obtained in both MEC E 303 and 403. Prerequisites: MEC E 300 and 301.

#### **MEC E 409 Experimental Design Project I**

★4 (*fi 6*) (either term, 2-0-4). Selected group projects in experimental measurement and mechanical design. Two to four person groups develop planning, design, testing and report writing skills on projects in applied mechanics, thermosciences and engineering management. Prerequisites: MEC E 301 and ENG M 310 or 401.

#### **MEC E 415 Busting Myths with Analysis**

★3 (*fi 6*) (either term, 3-0-0). Engineering analysis is used to examine the veracity of commonly held science and technology myths. Prerequisites: MEC E 330, 340, 370, 380, 390, MATH 300.

#### **MEC E 420 Feedback Control Design of Dynamic Systems**

★3.8 (*fi 6*) (either term, 3-0-3/2). Design of linear feedback control systems for command-following error, stability, and dynamic response specifications.

PID, Root-locus, frequency response and design techniques. An introduction to structural design limitations. Examples emphasizing Mechanical Engineering systems. Some use of computer aided design with MATLAB/Simulink. Controls Lab - control of mechanical systems. Prerequisites: MEC E 390 or equivalent and consent of Instructor. Credit can only be granted for one of MEC E 420, E E 469, CH E 448.

#### **MEC E 430 Fluid Mechanics II**

★3 (*fi 6*) (either term, 3-0-0). Navier-Stokes equations, introductory computational fluid dynamics, boundary layers, compressible fluid flow (variable area ducts, normal and oblique shock waves, Prandtl-Meyer expansions, adiabatic and isothermal pipe flow), two phase flow. Prerequisite: MEC E 330.

#### **MEC E 439 Principles of Turbomachines**

★3 (*fi 6*) (either term, 3-0-0). Use of turbomachines in ground based and flight applications, thermodynamic cycles for gas turbines and cogeneration, performance predictions of propellers, compressors and turbines, air-breathing combustion and emissions. Prerequisites: MEC E 330, 340, 370, and 430.

#### **MEC E 443 Energy Conversion**

★3 (*fi 6*) (either term, 3-0-0). Sources, flow and overall efficiency of use of various energy forms in society, thermodynamic analysis of energy conversion devices such as thermoelectric and magnetohydrodynamic generators, solar and fuel cells, energy from fission and fusion reactors. Prerequisite: MEC E 340.

#### **MEC E 451 Vibrations and Sound**

★3.5 (*fi 6*) (either term, 3-0-1). Free and forced vibration of single degree of freedom systems with and without damping, vibration isolation, free vibration of multi degrees of freedom systems, vibration absorption, beam vibrations, sound waves, sound sources, subjective aspects of noise. Prerequisites: MEC E 250 and MATH 300.

#### **MEC E 460 Design Project**

★4 (*fi 6*) (either term, 2-0-4). Feasibility study and detailed design of a project which requires students to exercise creative ability, to make assumptions and decisions based on synthesis of technical knowledge, and in general, devise new designs, rather than analyse existing ones. Prerequisites: MEC E 200, 330, 340, 360, 362, 370, 380. Corequisite: ENG M 310 (or ENG M 401).

#### **MEC E 463 Thermo-Fluids Systems Design**

★4 (*fi 6*) (either term, 3-0-2). Design and optimization of thermo-fluid systems, heating and ventilating equipment and load calculations, system design, piping networks, heat exchanger analysis and design, computer-aided design projects. Prerequisites: MEC E 330, 340, and 370.

#### **MEC E 464 Design for Manufacture**

★4 (*fi 2*) (either term, 1-2s-4). Design of machine components for ease of manufacture. Application of measurement, inspection, and reverse engineering techniques. Preparation of working drawings for manufacturing. Introduction to machining operations, including hands-on machine shop practice. Evaluation of design performance. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisites: MEC E 260, 265, 300, and 301.

#### **MEC E 466 Building Systems Design**

★4 (*fi 6*) (either term, 3-0-2). Design and analysis of building systems for maintaining the indoor environment. Design of heating, ventilation and air conditioning systems through load calculations, equipment selection and specification. Prerequisites: MEC E 340, 370 or consent of Instructor.

#### **MEC E 468 Numerical Simulation in Mechanical Engineering Design**

★4.5 (*fi 6*) (either term, 3-0-3). Computer modelling in mechanical engineering. Simulation of mechanisms. Stress analysis and heat transfer using commercial software. Emphasis is on numerical model design including testing and verification methods, and the critical interpretation of the computed results. Credit cannot be obtained in both MEC E 468 and 568. Prerequisites: MEC E 265, 362, 370, 380, 390, or consent of instructor.

#### **MEC E 469 Experimental Design Project II**

★2.5 (*fi 5*) (either term, 1-0-3). Advanced project in experimental measurement and mechanical designs in applied mechanics, thermosciences and engineering management. Prerequisite: MEC E 409.

#### **MEC E 480 Advanced Strength of Materials II**

★3 (*fi 6*) (either term, 3-0-0). Special topics for beams, torsion, pressure vessels, plane stress and strain, stability, fracture mechanics. Prerequisites: MEC E 360, 380, MATH 300.

#### **MEC E 494 Introduction to Research**

★0.5 (*fi 1*) (first term, 0-1s-0). Introduction to methods of mechanical engineering research. Organizational seminars for the research project in the following term. Prerequisites: MEC E 330, 380, and consent of Department.

#### **MEC E 495 Research Project**

★3 (*fi 6*) (second term, 0-0-6). Mechanical Engineering undergraduate research project with a faculty member. Prerequisites: MEC E 494 and consent of Department.

## Graduate Courses

**Note:** The courses ENG M 620, MEC E 630, 640, 670, 680 and 681 normally will be offered annually. Other courses will be offered on a lecture basis when there is sufficient enrolment; otherwise they will be offered on a guided reading basis.

### MEC E 537 Aerodynamics

★3 (fi 6) (either term, 3-0-0). Boundary layer flow, vorticity, circulation and aerodynamic lift, wing theory, aeronautical applications. Prerequisite: MEC E 330 or equivalent.

### MEC E 539 Applied Computational Fluid Dynamics

★4.5 (fi 6) (either term, 3-0-3). Grid generation, time-marching methods, control volume formulations, shock capture, artificial dissipation, upwind flux-limiting, space-marching multigrid acceleration. Hands-on experience with commercial CFD codes to illustrate practical implementations and performance of theory. Prerequisites: MEC E 390, and 330 or equivalent.

### MEC E 541 Combustion Engines

★3 (fi 6) (either term, 3-0-0). History of basic cycles, combustion theory including ignition flame propagation and engine knock, cycle analysis with deviations from ideal cycles and performance characteristics, fuels, design and operation of carburation and injection processes, exhaust emissions measurements. Identification of design parameters and their effect on emissions. Prerequisite: MEC E 340.

### MEC E 551 Mechanics and Control of Robot Manipulators

★3.5 (fi 6) (either term, 3-1s-0). History and classification of robot manipulators, kinematics and dynamics, Singularity and Jacobian analysis, path/trajectory planning, open-loop and feedback control of robot manipulators. Some computer simulation and design using MATLAB/Simulink. Prerequisites: MEC E 250, 390 or consent of Instructor.

### MEC E 553 Acoustics and Noise Control

★3 (fi 6) (either term, 3-0-0). Acoustic waves, sound transmission through walls and structures, acoustics of large and small rooms, mechanisms of sound absorption. Design of silencers. Prerequisites: MEC E 330 and 451.

### MEC E 563 Finite Element Method for Mechanical Engineering

★4.5 (fi 6) (either term, 3-0-3). Application of finite element methods to mechanical engineering problems; topics include direct stiffness methods, assembly, constraints, solution techniques, post-processing, element types and the Galerkin procedure. Applications include beam truss and frame analysis, plane strain and stress problems, heat transfer and dynamic analysis Prerequisites: MATH 300, MEC E 360, 390 (or equivalents).

### MEC E 564 Design and Simulation of Micro-Electromechanical Systems (MEMS)

★3 (fi 6) (either term, 3-0-0). Overview of micro-systems, common micro-systems and their working principles, mechanical modeling and simulation of MEMS, scaling laws in miniaturization, material for MEMS and micro-systems, mechanical design of micro devices, mechanical packaging of micro devices, overview on micro-systems fabrication processes. Corequisite: MEC E 563 or equivalent.

### MEC E 569 Mechanics and Design of Composite Materials

★3 (fi 6) (either term, 3-0-0). Introduction to composite materials. Mechanical characterization and strength theories of a lamina. Micro-mechanical analysis of a lamina. Macro-mechanical analysis of laminates. Failure analysis and design of laminates. Prerequisite: MEC E 380.

### MEC E 585 Biomechanical Modelling of Human Tissues and Systems

★3 (fi 6) (either term, 3-0-0). Biomechanics; mechanical characterization of biological tissues using elastic and viscoelastic models. Rheology of blood and flow properties. Static and dynamic analyses of selected physiological systems. Application of biomaterials in external and internal prostheses. Prerequisites: BME 210, BME 211, MEC E 300, 330, 362 and MEC E 380 or consent of Instructor.

### MEC E 606 Photonics Measurement Systems in Fluid Mechanics

★3 (fi 6) (either term, 3-0-0). Fundamentals of optics and optoelectronics for applications in measurement systems used in fluid mechanics including PIV, PLIF, LDA, and particle sizing. Design and development of measurement systems. Prerequisites: Consent of instructor.

### MEC E 615 Control Methods Applied to Partial Differential Equations

★3 (fi 6) (either term, 3-0-0). Introduction to control methods applied to systems governed by partial differential equations. The focus will be on fluid and solid mechanics applications with boundary actuation.

### MEC E 620 Combustion

★3 (fi 6) (either term, 3-0-0). Chemical reactions, chemical equilibrium and flame temperatures. Flame propagation and explosion theories. Detonations. Air pollution from combustion sources.

### MEC E 630 Fluid Dynamics

★3 (fi 6) (either term, 3-0-0). Kinematics of fluid motion, fundamental fluid equations and concepts, laminar boundary layers, potential flow, stability and transition, introduction to turbulence.

### MEC E 631 Microfluidics and Nanofluidics

★3 (fi 6) (either term, 3-0-0). Micro-scale fluid mechanics; gas flows; thermal

effects; liquid flows; lubrication theory; Experimental methods in micro-flows; Fabrication techniques for microfluidics; Numerical methods; Fluids in nanochannels. Prerequisites: Consent of Instructor.

### MEC E 632 Turbulent Fluid Dynamics

★3 (fi 6) (either term, 3-0-0). Governing equations of turbulent flow. Statistical and phenomenological theories of turbulent transport of momentum, heat and mass in wall-bounded and free flows. Computational techniques, empirical data and applications. Prerequisite: MEC E 630 or equivalent or consent of Instructor.

### MEC E 633 Particle Engineering

★3 (fi 6) (either term, 3-0-0). Microparticle terminology and definitions, synthesis of structured microparticles, analytical methods for micro- and nanoparticles, applications of particle engineering.

### MEC E 634 Aerosol Science and Technology

★3 (fi 6) (either term, 3-0-0). Introduction to aerosol science. Particle size statistics. Particle motion: Stokes law, Brownian motion, and thermophoresis. Particle coagulation, condensation, evaporation, and nucleation. Particle electrical and optical properties. Aerosol measurement techniques.

### MEC E 635 Mechanics of Respiratory Drug Delivery

★3 (fi 6) (either term, 3-0-0). Introduction to pharmaceutical aerosol delivery to the lung. Particle size distributions. Motion of a single aerosol particle in a fluid. Particle size changes due to evaporation or condensation. Fluid dynamics and particle deposition in the respiratory tract. Jet nebulizers. Dry powder inhalers. Metered dose propellant inhalers. Prerequisite: MEC E 330 or equivalent or consent of Instructor.

### MEC E 636 Environmental Fluid Mechanics

★3 (fi 6) (either term, 3-0-0). Transport of passive and active scalars. Plumes and environmental convection with applications to air pollution. Gravity currents and intrusions. Surface gravity waves. Flow in porous media. Darcy's law with applications to groundwater flow and oil recovery. Turbulent boundary layers in the natural environment. Prerequisite: MEC E 630 or MATH 556 or consent of Instructor.

### MEC E 637 Colloidal Hydrodynamics

★3 (fi 6) (either term, 3-0-0). Colloidal Systems; Colloidal Interactions; Hydrodynamics; Analysis of Complex Fluid flows; Thin Films; Flow in Porous Media; Microfluidics; Selected applications: Coagulation, flocculation and particle deposition; Sedimentation; Separation technologies such as deep bed filtration, membrane filtration, and chromatography; Microfluidic applications involving complex fluids; Colloid applications involving complex fluids; Colloid facilitated transport. Prerequisite/Corequisite; MEC E 430, 630, or approval of instructor.

### MEC E 638 Vortex Flows

★3 (fi 6) (either term, 3-0-0). Vortex dynamics approach to large-scale structures in turbulent flows. Vortex motion equations, conservation laws, and modelling using discrete vortices. Prerequisite: a senior undergraduate course in fluid mechanics or consent of Instructor.

### MEC E 639 Computational Fluid Dynamics

★3 (fi 6) (either term, 3-0-0). Computational fluid dynamics methods for incompressible and compressible fluids. Application to aeronautical and internal flows, finite difference, finite volume, and spectral methods. Prerequisite: CH E 674 or equivalent or consent of Instructor.

### MEC E 640 Analytical Thermodynamics

★3 (fi 6) (either term, 3-0-0). Postulatory approach to thermodynamics, equilibrium and maximum entropy principles, fundamental equations, Legendre transformation, Maxwell relations, calculation of property changes, thermodynamics of elastic systems, rubber elasticity, and surface thermodynamics. Prerequisite: MEC E 340 or consent of Instructor.

### MEC E 643 Renewable Energy Engineering and Sustainability

★3 (fi 6) (either term, 3-0-0). Principles of renewable energy systems such as solar, wind, tidal, biomass, geothermal, and fuel cells. Environmental aspects of implementation of renewable energy e.g. hydro and nuclear energy sources. Energy conservation and conventional fossil fuel sources. New technologies and trends in renewable energy. Concept of sustainability and sustainable design for energy systems. Elementary economics of implementation of renewable energy sources and related policy and social issues. Prerequisites: consent of instructor.

### MEC E 645 Transport and Kinetic Processes in Electrochemical Systems

★3 (fi 6) (either term, 3-0-0). Introduction to the thermodynamics of electrochemical systems such as batteries and fuel cells. Analysis of the main physical process in electrochemical systems: electrode kinetics, mass transport, and charge transport. Introduction to fuel cells and fuel cell systems.

### MEC E 650 Analytical Dynamics

★3 (fi 6) (either term, 3-0-0). Principle of virtual work; Lagrange's equations of motion for holonomic and non-holonomic systems; Hamilton's principle; application to gyroscopes, stabilizers, etc.

### MEC E 651 Advanced Robotics: Analysis and Control

★3 (fi 6) (either term, 3-0-0). Introduction to advanced robotics including mobile robots, redundant manipulators, walking robots, aerial and marine autonomous



vehicles. Kinematic and dynamic models for advanced robots. Linear and nonlinear control theory overview with applications to advanced robots.

**MEC E 653 Signal Processing of Time and Spectral Series**

★3 (fi 6) (either term, 3-0-0). Practical application of processing techniques to the measurement, filtering and analysis of mechanical system signals; topics include: signal classification, A/D conversion, spectral analysis, digital filtering and real-time signal processing.

**MEC E 655 Dynamics of Structures**

★3 (fi 6) (either term, 3-0-0). Behavior of elastic structures subjected to dynamic loads. Vibrations of buildings and bridges excited by machinery, earthquakes, wind and traffic.

**MEC E 656 Wave Propagation in Structures**

★3 (fi 6) (either term, 3-0-0). Introduction to advanced structures, dynamic elasticity equations and concepts, wave propagation in flexural structures, active control of wave propagation and vibration.

**MEC E 662 Introduction to Polymer Microfabrication**

★3 (fi 6) (either term, 3-0-0). Microfabrication technologies, MEMS and microfluidics using polymers and plastics, introduction to soft-lithography, choosing polymers for microfabricated products, functional polymers and composites, characterization and testing of microstructured polymers, packaging and bonding of polymers.

**MEC E 663 Theory and Applications of Finite Element Method**

★3 (fi 6) (either term, 3-0-0). Introduction of the basic theory and applications of the finite element method. Applications will focus on linear partial differential equations in solid mechanics, fluid mechanics and thermal science.

**MEC E 664 Advanced Design and Simulation of Micro and Nano Electromechanical Sensors (MEMS/NEMS)**

★3 (fi 6) (either term, 3-0-0). Advanced topics dealing with MEMS technologies, transduction mechanisms, and microfabricated sensors and actuators. Sensors for acceleration, rotation rate, pressure, and different micro actuators. MEMS in microfluidics and biomedical applications. Chemical, gas, and biosensors. Prerequisite: MEC E 563 and consent of Instructor. Not open to students with credit in MEC E 564.

**MEC E 667 Life Cycle Assessment**

★3 (fi 6) (either term, 3-0-0). Introduction to the concept of Life Cycle Assessment (LCA). History and development of LCA methodologies and standards. Stages of LCA analysis: goal definition, scoping, inventory assessment, impact analysis, improvement analysis, reporting. Sources of data, boundary selection and uncertainty. Relationship between LCA, Design for Environment, and other environmental management tools. Credit cannot be obtained in both MEC E 567 and 667. Prerequisites: STAT 235 or equivalent, or consent of department.

**MEC E 671 Heat Conduction**

★3 (fi 6) (either term, 3-0-0). Formulation of the basic governing equations in rectangular, cylindrical and spherical coordinates. Consideration of linear and nonlinear problems. Topics include: conduction with energy generation, transpiration cooling, conduction in non-stationary systems, phase transformation, and heat transfer in living tissue. Exact analytic solutions. Application of the integral method and perturbation solutions. Prerequisites: MEC E 370 and MATH 300, or equivalent.

**MEC E 673 Heat Convection**

★3 (fi 6) (either term, 3-0-0). Conservation equations for mass, momentum and energy. Laminar and turbulent convection boundary layers. Free and forced convection. Convection with phase change. Heat convection in porous media. Microchannel heat transfer. Approximate solutions. Prerequisites: MEC E 370, 330, and MATH 300, or equivalent.

**MEC E 680 Continuum Mechanics**

★3 (fi 6) (either term, 3-0-0). Introduction to cartesian tensor algebra and calculus; analysis of finite deformation and kinematics of motion; transport theorems and balance laws; analysis of stress; continuum thermodynamics, constitutive equations and material symmetry with application to solids and fluids.

**MEC E 681 Elasticity**

★3 (fi 6) (either term, 3-0-0). Extension, torsion and flexure of beams; two-dimensional problems; complex variable methods; integral transform methods; variational methods.

**MEC E 682 Nanomechanics**

★3 (fi 6) (either term, 3-0-0). Surface forces, van der Waals forces, electrostatic forces, Poisson-Boltzmann equation, capillary forces, adhesion contact mechanics, surface energy, tip-surface interaction, adhesion of micro-cantilevers, microbeam arrays, carbon nanotubes, dissipation in MEMS/NEMS, fluid flow with slip, mechanical models for cells, biomembranes, cellular filaments, microtubules, molecular dynamics (MD) simulation. Prerequisite: MEC E 380 or consent of instructor.

**MEC E 683 Statistical Mechanics with Applications**

★3 (fi 6) (either term, 3-0-0). Review of classical mechanics and thermodynamics concepts; introduction to principles of statistical mechanics; concepts of ensembles and ensemble average; probability function and partition function in different

ensembles; calculation of thermodynamic quantities from statistical mechanics; applications to polymer elasticity, cell mechanics, fracture mechanics and theories of electrolytic solutions; Monte-Carlo and Molecular Dynamics simulations in different ensembles. Prerequisites: Consent of instructor.

**MEC E 685 Macro Fracture Mechanics**

★3 (fi 6) (either term, 3-0-0). Basic concepts of linear and nonlinear fracture mechanics: linear and nonlinear stationary crack-tip stress, strain and displacement fields; energy balance and energy release rates; fracture resistance concepts-static and dynamic fracture toughness; criteria for crack growth; fracture control methodology and applications.

**MEC E 687 Introduction to Impact Dynamics of Materials**

★3 (fi 6) (either term, 3-0-0). Elastic waves, plastic waves, shock waves and stress wave propagation in solids. Low velocity impact on fibre composite materials and failure criteria. High velocity impact mechanisms and fracture criteria. Impact penetration mechanics. Dynamic deformation and fracture of materials. Prerequisite: MEC E 480 or consent of Instructor.

**MEC E 688 Mechanics of Biological Tissues**

★3 (fi 6) (either term, 3-0-0). Advanced topics dealing with modeling of biological solids such as bone, soft tissues, cartilage, ligament, and tendon; constitutive behaviour and modelling; linear and non-linear approaches; viscoelastic and quasilinear viscoelasticity models; experimental techniques and theoretical predictions. Prerequisite: Consent of instructor.

**MEC E 689 Advanced Continuum Mechanics**

★3 (fi 6) (either term, 3-0-0). Development of the balance laws and constitutive theory of the thermodynamic and electromagnetic deformable media. Entropy production, entropy inequalities, internal constraints and material symmetry for viscous fluids and nonlinear solids. Maxwell's equations and their extension to electromagnetic interactions in materials and coupling with mechanical and thermal effects are introduced at a general level. Prerequisite: MEC E 680 or consent of Instructor.

**MEC E 690 Analytical Techniques in Engineering**

★3 (fi 6) (either term, 3-0-0). Application of mathematical techniques to the solution of ordinary and partial differential equations arising in engineering problems. In particular, separation of variables, method of characteristics, transform methods, solution by complex variables, and variational methods will be considered. Prerequisite: MATH 300 or equivalent.

**MEC E 692 Fundamentals of Engineering Numerical Analysis**

★3 (fi 6) (either term, 3-0-0). Interpolation, numerical differentiation (finite differences), numerical integration, numerical solution of ordinary differential equations, numerical solution of partial differential equations, discrete transform methods.

**MEC E 700 Special Advanced Topics in Mechanical Engineering**

★3 (fi 6) (either term, 3-0-0).

**MEC E 728 Advanced Topics in Applied Thermodynamics I**

★3 (fi 6) (either term, 3-0-0).

**MEC E 729 Advanced Topics in Applied Thermodynamics II**

★3 (fi 6) (either term, 3-0-0). Combustion, refrigeration.

**MEC E 738 Advanced Topics in Fluid Dynamics I**

★3 (fi 6) (either term, 3-0-0).

**MEC E 739 Advanced Topics in Fluid Dynamics II**

★3 (fi 6) (either term, 3-0-0). Aerodynamics, rarefied gas dynamics, turbulence, hydro and thermo stability.

**MEC E 748 Advanced Topics in Thermodynamics I**

★3 (fi 6) (either term, 3-0-0).

**MEC E 749 Advanced Topics in Thermodynamics II**

★3 (fi 6) (either term, 3-0-0). Energy conversion, general thermodynamics, irreversible thermodynamics.

**MEC E 758 Advanced Topics in Dynamics I**

★3 (fi 6) (either term, 3-0-0).

**MEC E 759 Advanced Topics in Dynamics II**

★3 (fi 6) (either term, 3-0-0). Wave propagation, orbital dynamics.

**MEC E 778 Advanced Topics in Heat Transfer I**

★3 (fi 6) (either term, 3-0-0).

**MEC E 779 Advanced Topics in Heat Transfer II**

★3 (fi 6) (either term, 3-0-0). Conduction, convection, radiation.

**MEC E 789 Advanced Topics in Solid Mechanics II**

★3 (fi 6) (either term, 3-0-0). Elasticity plasticity, viscoelasticity, shells.

**MEC E 900 Directed Research Project**

★6 (fi 12) (variable, unassigned). Detailed Engineering report in the student's major area of interest.

**MEC E 910 Directed Research Project**

★3 (fi 6) (variable, unassigned). Detailed Engineering Report in the student's major area of interest.

## 231.187 Medical Genetics, MDGEN

Department of Medical Genetics  
Faculty of Medicine and Dentistry

### Graduate Courses

#### MDGEN 601 Selected Topics in Medical Genetics

★3 (fi 6) (either term, 0-3s-0). A directed reading and seminar course based on papers taken from the recent literature of medical genetics. The course consists of lectures on a specific topic in medical genetics and oral presentations of the current literature by students. Selected topics vary so that students may take the same course but examining a different topic for additional credit. Prerequisite: consent of the Department of Medical Genetics.

#### MDGEN 602 Special Topics in Medical Genetics

★1 (fi 2) (either term, 0-1s-0). This course is designed as a journal club and discussion group in which topics in medical genetics are discussed. Students will critically discuss papers and give oral presentations to the class. Specific topics will include research in genomics, disease gene cloning, chromosome structure, and clinical aspects of medical genetics. Prerequisite: consent of the Department of Medical Genetics.

#### MDGEN 605 Directed Reading in Medical Genetics

★3 (fi 6) (either term, 3-0-0). Reading and study of a specific topic related to the student's MSc or PhD Program in the Department of Medical Genetics under the direction of one or more faculty members. Prerequisite: consent of Department.

## 231.188 Medical Laboratory Science, MLSCI

Division of Medical Laboratory Science  
Faculty of Medicine and Dentistry

### Notes

- (1) See also INT D 409 and 491 for courses offered by more than one Department or Faculty and which may be taken as options or as a course in this discipline.
- (2) MLSCI 320, 330, 340, 350, 360, and 370 are to be taken as a unit over a 37-week period. They are open to students of Medical Laboratory Science only or by special permission of the Division.

### Undergraduate Courses

#### MLSCI 200 Transition to Clinical Practice

★3 (fi 6) (two term, clinical rotation). Self development of requisite skills and abilities for medical laboratory professionals. There will be emphasis on client centered approaches, preanalytical issues, quality assurance systems, sample procurement, and other laboratory skills.

#### MLSCI 230 Hematology

★3 (fi 6) (first term, 3-0-6). An introduction to the theory and practise of hematology, this course will include the morphology, structure, and function of red cells, white cells, and platelets, malignant and benign conditions that affect each cell type, and tests to distinguish among disease states including anemia and leukemia. Restricted to Medical Laboratory Science students.

#### MLSCI 231 Hematology

★3 (fi 6) (first term, 3-0-0). This course is designed for students who are excused from the laboratory component of the normal MLSCI course. An introduction to the theory and practise of hematology, this course will include the morphology, structure, and function of red cells, white cells, and platelets, malignant and benign conditions that affect each cell type, and tests to distinguish among disease states including anemia and leukaemia. Prerequisite: RT (CSMLS) certification or consent of Department. Credit granted for only one of MLSCI 230 or 231.

#### MLSCI 235 Hemostasis

★1 (fi 2) (second term, 3-0-6 in 4 weeks). Four weeks. This course will present the theory and practice of hemostasis. Topics include the vascular, platelet, clotting factor, fibrinolytic, and inhibitor systems: coagulation disorders; tests that identify factor deficiencies, monitor anticoagulant therapy, and assess thrombolytic states; disorders of hemostasis. Prerequisite: MLSCI 230 or consent of Department. Restricted to Medical Laboratory Science students.

#### MLSCI 236 Hemostasis

★1 (fi 2) (second term, 3-0-0 in 4 weeks). Four weeks. This course is designed for students who are excused from the laboratory component of the normal MLSCI course. This course will present the theory and practice of hemostasis. Topics include the vascular, platelet, clotting factor, fibrinolytic and inhibitor systems: coagulation disorders; tests that identify factor deficiencies, monitor anticoagulant therapy, and assess thrombolytic states; disorders of hemostasis. Prerequisite: MLSCI 230 or consent of Department. Restricted to Medical Laboratory Science students.

#### MLSCI 242 Pathogenic Microbiology I

★3 (fi 6) (first term, 3-0-4). As an introduction to clinical immunology and

bacteriology, this course considers the most common and notorious pathogenic bacteria and the fundamentals of the human immune response that are critical to our health. The lecture portion of the course will focus on microbial pathogenic mechanisms and ways these pathogens get established and avoid destruction by the immune response. The laboratory portion of the course will focus on diagnostic procedures, such as isolation and characterization of these pathogenic microorganisms. Restricted to Medical Laboratory Science students. May not be taken for credit if credit already received in MMID 240 or MMI 240 or MLSCI 240.

#### MLSCI 243 Pathogenic Microbiology II

★3 (fi 6) (second term, 3-0-4). Continuation to the introduction to Pathogenic Microbiology I, this course considers the most common and notorious pathogenic anaerobic bacteria, viruses, fungi, and parasites in human disease. The lecture portion of the course will focus on pathogenic mechanisms and ways these pathogens get established and avoid destruction by the immune response. The course will also cover the mechanisms of antimicrobial action. The laboratory portion of the course will focus on diagnostic procedures, such as isolation and characterization of these pathogens. Prerequisite: MLSCI 242. Restricted to Medical Laboratory Science students. May not be taken for credit if credit already received in MMID 240 or MMI 240 or MLSCI 240.

#### MLSCI 244 Pathogenic Microbiology I

★3 (fi 6) (first term, 3-0-0). As an introduction to clinical immunology and bacteriology, this course considers the most common and notorious pathogenic bacteria and the fundamentals of the human immune response that are critical to our health. The lecture portion of the course will focus on microbial pathogenic mechanisms and ways these pathogens get established and avoid destruction by the immune response. Prerequisite: CSMLS general certification or consent of the department. May not be taken for credit if credit already obtained in MMID 241 or MMI 241 or MLSCI 241.

#### MLSCI 245 Pathogenic Microbiology II

★3 (fi 6) (second term, 3-0-0). Continuation to the introduction to Pathogenic Microbiology I, this course considers the most common and notorious pathogenic anaerobic bacteria, viruses, fungi, and parasites in human disease. The lecture portion of the course will focus on pathogenic mechanisms and ways these pathogens get established and avoid destruction by the immune response. The course will also cover the mechanisms of antimicrobial action. Prerequisite: MLSCI 244 and CSMLS general certification or consent of the department. May not be taken for credit if credit already received in MMID 241 or MMI 241 or MLSCI 241.

#### MLSCI 250 Human Histology and Histotechnology

★3 (fi 6) (either term, 3-0-4). This course is primarily designed to provide an understanding of human histology and of the techniques used in its study. It will also include, in part, basic pathology (including the nature of malignant disease) and the application of histological and histochemical techniques to demonstrate the diagnostic features of human disease processes. The goal of the course is for students to understand the structure and functions of the cell, and the components and functions of organ systems. The course will also teach students to recognize human tissues at the light and electron microscopical levels. Lectures will be used to illustrate basic principles, and the ability to recognize tissues and organ systems will be acquired in the laboratory. Students will be expected to acquire a detailed knowledge of the subject both from a theoretical and practical level. Restricted to Medical Laboratory Science students or consent of Department.

#### MLSCI 262 Clinical Biochemistry

★3 (fi 6) (first term, 3-0-3). This course considers how the analysis of samples from the body for various constituents can give insight into pathological processes. Included are the principles for tests routinely carried out in a clinical biochemistry laboratory, and the biological understanding of test results. Specific subjects considered are carbohydrates, renal function, blood proteins and electrolytes, and acid-base balance. Restricted to Medical Laboratory Science students.

#### MLSCI 263 Clinical Biochemistry

★3 (fi 6) (second term, 3-0-3). This course considers how the analysis of samples from the body for various constituents can give insight into pathological processes. Included are the principles for tests routinely carried out in a clinical biochemistry laboratory, and the biological understanding of test results. Specific subjects considered are clinical enzymology, heme catabolism, liver function toxicology and therapeutic drug monitoring principles of immunoassays, blood lipids porphyrins, endocrinology, gastric and GI function, fetal-placental function, and biochemical tumor markers. Restricted to Medical Laboratory Science students.

#### MLSCI 264 Clinical Biochemistry

★3 (fi 6) (first term, 3-0-0). This course considers how the analysis of samples from the body for various constituents can give insight into pathological processes. Included are the principles for tests routinely carried out in a clinical biochemistry laboratory, and the biological understanding of test results. Specific subjects considered are carbohydrates, renal function, blood proteins and electrolytes, and acid-base balance. Prerequisites for non-Medical Laboratory Science students only: CHEM 101, 161, 163 and BIOL 107. Credit granted for only one of MLSCI 262 or 264.

**MLSCI 265 Clinical Biochemistry**

★3 (fi 6) (second term, 3-0-0). This course considers how the analysis of samples from the body for various constituents can give insight into pathological processes. Included are the principles for tests routinely carried out in a clinical biochemistry laboratory, and the biological understanding of test results. Specific subjects considered are clinical enzymology, heme catabolism, liver function, toxicology and therapeutic drug monitoring, principles of immunoassays, blood lipids, porphyrins, endocrinology, gastric and GI function, fetal-placental function, and biochemical tumor markers. Prerequisites for non-Medical Laboratory Science students only: MLSCI 264. Credit granted for only one of MLSCI 263 or 265.

**MLSCI 270 Transfusion Science**

★2 (fi 4) (second term, 3-0-6 in 9 weeks). Nine weeks. This course will present the theory and practice of transfusion science. Topics covered include the genetics of blood groups pretransfusion testing, blood donation and component therapy, adverse effects of transfusion, hemolytic disease of the newborn, and autoimmune hemolytic anemia. Prerequisite: MLSCI 230 or consent of Department. Restricted to Medical Laboratory Science students.

**MLSCI 271 Transfusion Science**

★2 (fi 4) (second term, 3-0-0 in 9 weeks). Nine weeks. This course is designed for students who are excused from the laboratory component of the normal MLSCI course. This course will present the theory and practice of transfusion science. Topics covered include the genetics of blood groups, or pretransfusion testing, blood donation and component therapy, adverse effects of transfusion, hemolytic disease of the newborn, and autoimmune hemolytic anemia. Prerequisite: MLSCI 230 or consent of Department. Restricted to Medical Laboratory Science students.

**MLSCI 320 Analysis and Communication of Biomedical Information**

★3 (fi 6) (two term, 1-0-2). Lectures, seminars, and assignments address the following components of writing a literature review: library searches, critical analysis, organizing, writing and editing. Speaking skills are developed through oral presentation of case studies. Prerequisite: consent of Division.

**MLSCI 330 Clinical Hematology**

★5 (fi 10) (two term, clinical rotation). As a part of a clinical laboratory education for Medical Laboratory Science students, this course will provide experience in a modern hospital hematology laboratory along with weekly tutorials followed by comprehensive theoretical and practical examinations.

**MLSCI 340 Clinical Microbiology**

★5 (fi 10) (two term, clinical rotation). As a part of a clinical laboratory education for Medical Laboratory Science students, this course will provide experience in a modern hospital microbiology laboratory along with weekly tutorials followed by comprehensive theoretical and practical examinations.

**MLSCI 350 Histopathology**

★3 (fi 6) (two term, clinical rotation). As a part of a clinical laboratory education for Medical Laboratory Science students, this course will provide experience in a modern hospital histopathology laboratory along with weekly tutorials followed by comprehensive theoretical and practical examinations.

**MLSCI 360 Clinical Biochemistry**

★5 (fi 10) (two term, clinical rotation). As a part of a clinical laboratory education for Medical Laboratory Science students, this course will provide experience in a modern hospital clinical biochemistry laboratory along with weekly tutorials followed by comprehensive theoretical and practical examinations.

**MLSCI 370 Transfusion Science**

★3 (fi 6) (two term, clinical rotation). As a part of a clinical laboratory education for Medical Laboratory Science students, this course will provide experience in a modern hospital transfusion service laboratory, along with weekly tutorials, followed by comprehensive theoretical and practical examinations.

**MLSCI 410 Introduction to Clinical Laboratory Management**

★1 (fi 2) (either term, 3-0-0 in 4 weeks). An introduction to the principles of management as they apply to clinical laboratories. Subject matter will include healthcare funding and allocation of funds, the management process in small and large clinical laboratories, performance appraisals, ethics and setting priorities for laboratory services. Prerequisite: consent of Division.

**MLSCI 430 Advanced Hematology**

★3 (fi 6) (second term, 3-0-0). This course is designed to enhance the student's ability to assimilate new and specialized knowledge in an evolving hematology discipline. As such, the course content will change from year to year. Consent of Division is required for non-Medical Laboratory Science students.

**MLSCI 460 Clinical Biochemistry**

★3 (fi 6) (second term, 3-0-0). Advanced lectures on specialized topics including diagnostic enzymology, blood lipids, transplantation biochemistry, hormone receptors and protein purification. Other topics will be considered through studies of case reports. A term paper is a requirement for this course. Prerequisite: BIOCH 200 and 330 or equivalents and consent of Division.

**MLSCI 466 Applied Toxicology**

★3 (fi 6) (first term, 3-0-0). A consideration of the protocols and their rationale used in a large toxicology laboratory. Topics include analytical, environmental,

regulatory, and inhalation toxicology; clinical and forensic toxicology; and doping related to sports. Prerequisites: BIOCH 200 and 330 or equivalents and consent of Division.

**MLSCI 475 Clinical Immunology**

★3 (fi 6) (either term, 3-0-0). The application of basic immunology concepts to disease and transplantation, and their monitoring by the clinical laboratory. Topics include the cellular and humoral immune responses, human immune development, immunology and cancer, immune deficiency, autoimmune disease, immunopathology, and transplant immunology. Prerequisite: IMIN 370 or equivalent and consent of Division.

**MLSCI 480 Molecular Genetic Approaches to the Study and Diagnosis of Disease**

★3 (fi 6) (first term, 3-0-0). Emphasis on the application of techniques of molecular genetics to the practice of Medicine. General subject areas include: organization of the genome, techniques of molecular genetics and their application to medicine, molecular genetics and oncology, and ethical issues involving these techniques as applied to medicine. Prerequisites: Genetics and BIOCH 200 and 330 or equivalents and consent of Division.

**MLSCI 481 Techniques in Molecular Biology**

★3 (fi 6) (either term, 1-0-5). A laboratory course emphasizing introductory and advanced techniques in molecular biology. Isolation of RNA, Northern blotting, construction of cDNA, amplification of DNA by the polymerase chain reaction, analysis of DNA by restriction digestion, transfection of eukaryotic cells for protein expression and Western blot analysis. Corequisite: MLSCI 480 or consent of Department. This course is designed for senior undergraduate students. Credit may only be obtained in one of MLSCI 481 or LABMP 581.

## 231.189 Medical Microbiology and Immunology, MMI

Department of Medical Microbiology and Immunology  
Faculty of Medicine and Dentistry

**Note:** See also the IMIN listings for the following courses offered by more than one department or faculty which may be taken as options or as a course in this discipline, specifically: IMIN 200, 324, 371, 372, and 452 (courses in immunology and infection); and INT D 409 and 491 (research project courses for medical laboratory science students).

### Undergraduate Courses

**0 MMI 133 Medical Microbiology for Health Care Professionals**

★3 (fi 6) (first term, 3-0-0). Introductory course in medical microbiology designed for students enrolled in health care related programs. The course begins with basic information on microorganisms (bacteria, viruses, fungi, parasites and prions), the immune system, infection control, transmission of infection, epidemiology, antimicrobials, disinfection and sterilization. The later part of the course concentrates on infectious diseases caused by pathogenic microorganisms.

**0 MMI 351 Bacterial Pathogenesis**

★3 (fi 6) (second term, 3-0-0). Medically important bacteria, how they cause disease and the body's immune response to bacteria. Lectures will systematically discuss the organisms and describe their distinctive as well as their common features of structure and pathogenicity. Prerequisites: MICRB 265 and IMIN 200. May not be taken for credit if credit already obtained in MLSCI 240 or 241.

**MMI 352 Microbial Pathogenesis**

★3 (fi 6) (second term, 0-0-4). This laboratory course will emphasize development of skills and knowledge for the safe handling of infectious microorganisms and will examine some of the molecular mechanisms of microbial virulence. Prerequisite or corequisite: MMI 351 or MLSCI 240 or 241 or consent of the Department.

**MMI 391 Current Methods in Molecular Biology**

★3 (fi 6) (first term, 0-0-8). This laboratory course will introduce the student to common techniques in molecular biology. Through a series of experiments, students will clone and express the genes for bioluminescence from the light-emitting bacterium *Vibrio fischeri*. Technical skills will include: preparation and quantification of genomic and plasmid DNAs, screening a genomic library, restriction mapping, amplification of DNA fragments using the polymerase chain reaction, Southern blotting, expression and purification of proteins, and detection of proteins by Western blotting. Prerequisites: IMIN 200 and departmental consent. Priority given to Honors students in the IMIN program. Credit may be obtained for only one of BIOL 391, IMIN 391 or MMI 391.

**0 MMI 405 Mechanisms of Pathogenicity I**

★3 (fi 6) (first term, 3-3s-0). Selected topics regarding the production of disease by bacterial pathogens, with special emphasis on the biochemical, immunological and physiological properties of the host and microbe that account for the pathological process. Contemporary concepts will be introduced by means of lectures and



student seminars. Prerequisites: BIOCH 200 and MMI 351 or MLSCI 240 or 241 or consent of Department.

#### **0 MMI 415 Advanced Viral Pathogenesis**

★3 (*fi 6*) (second term, 3-0-0). Mechanisms of viral pathogenesis, with an emphasis on how different viruses modulate the innate and adaptive immune systems to their advantage to avoid detection and elimination and the relevance of viruses in oncogenesis. Prerequisites: BIOCH 200, IMIN 324 and IMIN 371, or consent of Department.

#### **0 MMI 426 Medical Parasitology**

★3 (*fi 6*) (first term, 3-0-3). A survey of the protozoan and metazoan parasites of man. Emphasis will be placed on biology, epidemiology, clinical presentation and methods for detection and identification, as well as global impact of parasitic diseases in today's world. Prerequisite: MLSCI 240 or 241 or IMIN 200, consent of Department.

#### **0 MMI 427 Fungi Affecting Human and Animal Health**

★3 (*fi 6*) (first term, 3-0-3). Human health implications of allergenic, toxigenic and pathogenic fungi will be considered. Topics include pathogenicity, epidemiology, occupational and environmental risks of exposure to fungi or their metabolites, immune responses, diversity and ecology of fungi involved, aspects of clinical presentation, and principal tests and results expected for diagnosis of infection. The laboratory component consists of web-based exercises and assignments. Prerequisites: Introductory course in medical microbiology (MLSCI 240 or 241 or MMI 351) or mycology (BOT 306) or microbiology (MICRB 265) or consent of Department.

#### **0 MMI 445 Clinical Microbiology and Human Health**

★3 (*fi 6*) (second term, 3-0-0). This course will focus on the interactions between clinically relevant microorganisms and the host. Topics include important issues and contemporary problems in clinical microbiology regarding infectious diseases relevant to health care. Aspects that will be studied are: pathogenesis, epidemiology, immune responses, treatment and infection control. Recent advances in vaccines, laboratory diagnosis and techniques will be included. Prerequisites: MMI 133 or MLSCI 240 or IMIN 200 or MICRO 265 or consent of department.

#### **MMI 498 Research Project in Infection and Immunity**

★3 (*fi 6*) (either term, 0-0-6). Directed research on a specific topic in medical microbiology or immunology in the laboratory of an academic staff member associated with MMI. Can be taken for credit more than once. An oral presentation on the research project is required for completion of the course. Pre- or corequisites: IMIN 324 or 371 or 452 or MMI 351 and/or consent of Department.

#### **MMI 499 Independent Research in Infection and Immunity**

★6 (*fi 12*) (two term, 0-0-6). Directed research project on a specific topic in medical microbiology or immunology in the laboratory of an academic staff member associated with MMI. An oral presentation and a written report on the research project is required for completion of the course. Pre- or corequisites: IMIN 324 or 371 or 452 or MMI 351 and/or consent of the Department.

## Graduate Courses

#### **MMI 505 Mechanisms of Pathogenicity I**

★3 (*fi 6*) (first term, 3-3s-0). Selected topics regarding the production of disease by bacterial pathogens, with special emphasis on the biochemical, immunological and physiological properties of the host and microbe that account for the pathological process. Contemporary concepts will be introduced by means of lectures and student seminars. Lectures and seminars are the same as MMI 405, but there will be an additional requirement of a written research proposal. This course may not be taken if credit has already been obtained in MMI 405. Consent of Department required.

#### **MMI 510 Informatics for Molecular Biologists**

★3 (*fi 6*) (second term, 3-0-1). This course will introduce the student to common and advanced methods in bioinformatics. In lectures and hands-on computer sessions, the student will solve realistic biological questions in the areas of sequence analysis, distant homology detection, phylogeny, correlation of sequence to structure, protein structure analysis, and genomics. While the student will obtain a thorough understanding of bioinformatics methods, the focus is on application of methods in the context of molecular biology research rather than on details of algorithms or computer programming. As a final assignment students will write a mini-proposal for a molecular biology research project that incorporates a series of bioinformatics studies to complement and guide the experimental work. May not be taken for credit if credit has already been obtained in IMIN 410. Prerequisites: departmental consent. Priority given to MMI graduate students.

#### **MMI 512 Special Projects**

★3 (*fi 6*) (either term, 0-0-3).

#### **MMI 515 Mechanisms of Pathogenicity II**

★3 (*fi 6*) (second term, 3-0-0). Mechanisms of pathogenesis of globally significant infectious agents, such as protozoa, viruses and other microbes relevant in current endemics, oncogenesis, biological weapons, social and emerging diseases. Lectures are the same as MMI 415, but there will be an additional requirement

of a written/oral presentation on selected topics of emerging diseases. May not be taken for credit if credit has already been obtained in MMI 415. Consent of Department required.

#### **MMI 526 Medical Parasitology**

★3 (*fi 6*) (first term, 3-0-3). A survey of the protozoan and metazoan diseases of man. Emphasis will be placed on biology, epidemiology, clinical presentation and methods for detection and identification as well as global impact of parasitic diseases in today's world. Lectures and laboratories are the same as MMI 426, but there will be an additional requirement for a written literature review/discussion paper on recent developments or controversies in the field of parasitology. This course may not be taken for credit if credit has already been obtained in MMI 426. Consent of Department required.

#### **MMI 552 Advanced Immunology**

★3 (*fi 6*) (second term, 3-1s-0). A lecture course on the detailed mechanisms of the immune system, describing recent discoveries in cellular and molecular immunology. Topics include the mechanism of T-cell receptor selection, antigen processing, activation of B and T lymphocytes, cellular collaboration, negative and positive regulatory mechanisms in immunity, transplantation, cytokine actions and interactions. Interaction between immune systems and pathogens, and immunogenetics. Lectures are the same as IMIN 452, but there will be an additional requirement of a written paper to evaluate a current controversy in immunology. May not be taken for credit if credit has already been obtained for INT D 452 or IMIN 452. Consent of Department required.

#### **MMI 601 Seminar in Medical Microbiology and Immunology**

★3 (*fi 6*) (either term, 0-3s-0). The student will prepare a seminar on an assigned topic in medical microbiology or immunology. Evaluation will focus on presentation, content, discussion of other student seminars, and proficiency in chairing other presentations. Required course. Open to graduate students in Medical Microbiology and Immunology only.

#### **MMI 605 Current Topics in Infection and Immunity**

★3 (*fi 6*) (either term, 0-4s-0). Selected topics in infections and immunity are explored in depth through evaluation of the primary research literature. Emphasis is on the molecular and cellular mechanisms underlying pathogenesis, host resistance, and immune regulation. Information is provided through selected readings and student seminar presentations. The primary objective is to introduce students to current research topics in infection and immunity, and develop their ability to critically evaluate, organize, and present scientific information.

## 231.190 Medicine, MED

Department of Medicine  
Faculty of Medicine and Dentistry

**Note:** Joint Medicine/Dentistry Courses are listed under DMED.

## Undergraduate Courses

### 231.190.1 Faculty of Medicine and Dentistry Courses

#### **MED 400 Two-Week Medical Elective**

★0 (*fi 1*) (either term, 2 weeks). This represents a contract period of registration with variable start and end dates for undergraduate medical students who are undertaking clinical electives. The type of clinical elective is open to any area of specialization. Prerequisite: enrolment in an MD program and approval by the Electives Coordinator of the Faculty of Medicine.

#### **MED 401 Four-Week Medical Elective**

★0 (*fi 1*) (either term, 4 weeks). This represents a contract period of registration with variable start and end dates for undergraduate medical students who are undertaking clinical electives. The type of clinical elective is open to any area of specialization. Prerequisites: enrolment in an MD program and approval by the Electives Coordinator of the Faculty of Medicine.

#### **MED 402 Eight-Week Medical Elective**

★0 (*fi 2*) (either term, 8 weeks). This represents a contract period of registration with variable start and end dates for undergraduate medical students who are undertaking clinical electives. The type of clinical elective is open to any area of specialization. Prerequisites: enrolment in an MD program and approval by the Electives Coordinator of the Faculty of Medicine.

#### **MED 403 Twelve-Week Medical Elective**

★0 (*fi 3*) (either term, 12 weeks). This represents a contract period of registration with variable start and end dates for undergraduate medical students who are undertaking clinical electives. The type of clinical elective is open to any area of specialization. Prerequisites: enrolment in an MD program and approval by the Electives Coordinator of the Faculty of Medicine.

#### **MED 515 Community Health**

★3 (*fi 6*) (either term, 2-4s-0). The Community Health program provides an overview of the field of public health sciences and demonstrates its importance to health care professionals. Content will include an introduction to the various aspects of public

health (including disease and injury prevention, health promotion, determinants of health, disease surveillance, health status measurement, and population health), field experiences in public health operations, health care organizational issues, and evidence based medicine. This course has been specifically designed to emphasize the relevance of public health to everyday clinical practice.

#### **MED 516 Patient-Centred Care, Part 1**

★6 (*fi 12*) (two term, 2-6s-0). A discussion of medical skills which may be generalized across different disease states and different specialties. Topics include epidemiology, evidence-based Medicine, and public health, clinical skills, family issues, ethics, the role of the health-care team, and related areas. Instruction in the role of the health-care team will be carried out in conjunction with INT D 410. Open only to students registered in the MD program.

#### **MED 517 First-Year Elective**

★1 (*fi 2*) (either term, 12 hours). Electives time to be developed by the students in consultation with a Faculty supervisor. Open only to students registered in the MD program.

#### **MED 518 Optional Summer Elective**

★1 (*fi 2*) (variable, variable). An optional elective of variable length, to be developed by the student in consultation with a Faculty supervisor. Open only to students registered in the MD program.

#### **MED 519 Clinical Skills Program**

★3 (*fi 6*) (two term, 2-4s-0). The Clinical Skills Program covers instruction on how to take and record a history and physical examination, as well as to demonstrate appropriate communication skills and professional attributes. These tasks are covered in the Gilbert Scholars Program as well as in material from the blocks and from ancillary pediatric sessions.

#### **MED 520 Pre-Clinical Exam**

★5 (*fi 10*) (second term, 9 hours). Final pre-clinical exam for students registered in the MD program.

#### **MED 521 Gastroenterology and Nutrition**

★5 (*fi 10*) (either term, 6 weeks). An integrated course covering nutrition, gastrointestinal physiology, pathophysiology and anatomy. Related surgical, paediatric and geriatric topics will also be addressed. Open only to students registered in the MD program.

#### **MED 522 Reproductive Medicine and Urology**

★6 (*fi 12*) (either term, 7 weeks). An overview of reproductive medicine in both genders, including discussion of conception, pregnancy and fetal development, birth, reproductive technology and relevant health-related issues in men and women. Also covered will be the physiology, pathophysiology and anatomy of the urinary tract, and management of problems in the genitourinary system. Open only to students registered in the MD program.

#### **MED 524 Neurosciences**

★9 (*fi 18*) (either term, 11 weeks). Fundamental Clinical Neurosciences taught in an integrated fashion. Involves instruction in subject areas related to the head and neck, including Neuroanatomy, Neurophysiology, Neuropathology, Neuropharmacology, Neuroaudiology, Neurology, Neurosurgery, Psychiatry, Rehabilitation Medicine, otorhinolaryngology and Ophthalmology. Open only to students registered in the MD program.

#### **MED 525 Oncology**

★3 (*fi 6*) (either term, 4 weeks). Principles and concepts of clinical oncology. Open only to students registered in the MD program.

#### **MED 526 Patient-Centred Care, Part II**

★6 (*fi 12*) (two term, 2-4s-0). A continuation of MED 516, which involves further discussion of medical skills which may be generalized across different disease states and different specialties. Open only to students registered in the MD program.

#### **MED 527 Second Year Elective**

★1 (*fi 2*) (either term, 12 hours). Elective time to be developed by the student in consultation with a Faculty supervisor. Open only to students registered in the MD program.

#### **MED 528 Optional Summer Elective**

★1 (*fi 2*) (variable, variable). An optional elective of variable length, to be developed by the student in consultation with a Faculty supervisor. Open only to students registered in the MD program.

#### **MED 529 Clinical Skills Program**

★3 (*fi 6*) (two term, 2-4s-0). The Clinical Skills Program covers instruction on how to take and record a history and physical examination, as well as to demonstrate appropriate communication skills and professional attributes. These tasks are covered in the Gilbert Scholars Program as well as in material from the blocks and from ancillary pediatric sessions.

#### **MED 531 Clinical Problems Series**

★1 (*fi 2*) (two term, 36 hours). A series for students registered in the MD program.

#### **MED 532 Link**

★2 (*fi 4*) (first term, 2 weeks). This course serves as a transition between the pre-clinical and clinical years. It will include procedural skills, emergency medicine,

otolaryngology, radiology, a review of history taking and physical exam skills and of the responsibilities of the health care team. Open only to students registered in the MD Program.

#### **MED 540 Exams**

★5 (*fi 10*) (second term, 18 hours). Final exams for students registered in the MD program.

#### **MED 541 Clinical Problems Series**

★1 (*fi 2*) (two term, 36 hours). A series for students registered in the MD Program.

#### **MED 542 Review of Student Internship**

★1 (*fi 2*) (second term, 3 weeks). Lecture and seminar series for students registered in the final year of the MD Program.

#### **MED 543 Integrated Community Clerkship**

★36 (*fi 72*) (two term, 36 weeks). A patient-centred, community clerkship based in select rural and regional Alberta communities. This course uses Family Medicine as the core of the clerkship experience to provide students with experience in continuity of care, in handling undifferentiated problems, in coordinating care for those with chronic disease, and in other key areas of family medicine and generalist specialties. 32 to 36 weeks will be spent in the rural community. The remainder of the second term will be a mix of electives and selectives.

#### **MED 546 Medicine Student Internship**

★8 (*fi 16*) (either term, 8 weeks). Student internship in Medicine for students registered in the MD Program.

#### **MED 547 Clinical Electives**

★3 (*fi 6*) (either term, 3 weeks). Student internship in electives for students registered in the MD program.

#### **MED 555 Geriatrics Student Internship**

★3 (*fi 6*) (either term, 3 weeks). Student internship in Geriatrics for students registered in the MD Program.

#### **MED 556 Medicine Student Internship**

★3 (*fi 6*) (either term, 3 weeks). Student internship in medicine for students registered in the MD program.

#### **MED 557 Clinical Electives**

★16 (*fi 32*) (either term, 10 weeks). Electives for students registered in the MD Program.

#### **MED 558 Emergency Medicine Students Internship**

★3 (*fi 6*) (either term, 3 weeks). Student internship in emergency medicine for students registered in the MD Program.

## Graduate Courses

### 231.190.2 Department of Medicine Courses

#### **MED 501 Clinical Pulmonary Physiology**

★3 (*fi 6*) (second term, 2-0-0). Basic and clinical lectures on: Lung Structure; Pulmonary Blood Flow; Airflow; Gaseous Diffusion; Ventilation/Perfusion Matching; Control of Ventilation; Oxygen Transport; Lung Defense; Mucociliary Transport; ARDS; Asthma; Exercise; Lung Growth; Surfactant; Lung Metabolism; Pulmonary Function Testing. Prerequisites: General courses in Physiology, Physics and Biochemistry or consent of Department.

#### **MED 530 Clinical Exam**

★5 (*fi 10*) (second term, 18 hours). Comprehensive Year 3 examination for students registered in the MD Program.

#### **MED 571 Directed Reading in the Basic Medical Sciences**

★3 (*fi 6*) (either term, 3-0-0). Reading and study of basic medical science topics relevant to the student's chosen field of study under the direction of one or more faculty members. Prerequisite: consent of Department.

#### **MED 573 Directed Reading in Clinical Medicine**

★3 (*fi 6*) (either term, 3-0-0). Reading and study in a field relevant to the student's chosen field of study under the direction of one or more Faculty members. Prerequisite: consent of Department.

#### **MED 574 Health Informatics Research Methods**

★3 (*fi 6*) (either term, 39 hours in 2 weeks). A course to provide background knowledge in health informatics. Each session will consist of a formal lecture, followed by discussion on class assignments. Lectures will consist of Historical Development of Health Informatics Research, Identification of Research Problems, Ethics of Research, Quantitative Methodology, Qualitative Methodology, Blended Methodologies, and Interview Techniques. Prerequisite: Consent of the Department.

#### **MED 575 Nutrition and Metabolism**

★3 (*fi 6*) (two term, 1-1s-0). A seminar and discussion course in advanced nutrition and metabolism that examines current topics in nutrition and features regular seminars on alternate weeks throughout Fall and Winter Terms. A discussion group meets after each seminar. Preference will be given to graduate and postgraduate

students in the area of nutrition and metabolism. Maximum enrolment of 15. Prerequisite: consent of Department.

#### MED 591 Aboriginal Health and Healing

★3 (fi 6) (either term, 16 hours). This course aims to introduce students to Native American belief models in health. Topics which will be examined include the complexity of ceremony and religion, the Nêhiyaw healing principles of specific groups, including particulars of plant medicines, and the principles of healing from the Healer's perspective. The course will examine the influence of traditional healing practices on indigenous populations through different perspectives, including the effects of Aboriginal Residential Schools on the constitution of healing.

#### MED 600 Advanced Clinical Trials

★3 (fi 6) (either term, 3-0-0). A formal lecture course to provide a background knowledge in clinical trials. Each session will consist of a formal lecture, followed by discussion on class assignments. Lectures will consist of Experimental Designs; Patient Recruitment, Randomization, Blinding, Compliance and Generalization; Sample Size Calculations, Statistical Methods; Outcomes Measures; Equivalence Trials; Economic Evaluation and Clinical Trials; Multicentre Clinical Trials; Data: Efficacy and Safety and Working with Industry and Funding Agencies. Prerequisite: consent of Department.

#### MED 650 Fundamentals for Clinical Investigators

★3 (fi 6) (two term, 3/2-0-0). A biweekly lecture course covering the important aspects of becoming a clinical investigator. Each session will include a lecture followed by a full class discussion and take home assignments related to the lecture. The topics include: clinical trial design, bioethics, biostatistics, literature appraisal, grant writing, manuscript writing, slide presentation for oral presentations, teaching enhancement, time management, ethics of industry liaisons, linking basic bench research to the bedside, technology transfer, career opportunities. Prerequisite: consent of Department.

#### MED 671 Current Topics in Biomedical Research

★2 (fi 4) (two term, 0-1s-0). A general seminar course covering recent advances across the field of biomedical research. Research topics will feature the areas of research being investigated by the graduate students and staff of the department. All graduate students are required to participate and to give a research presentation. Other topics will provide for the acquisition of basic skills and knowledge in biomedical research and will include experimental design, critical review of the literature, communication skills, ethics of experimentation, and career development. Note: Restricted to graduate students in the Department of Medicine.

#### MED 700 Fundamentals for Translational Cardiovascular Clinical Investigators (#1)

★6 (fi 12) (two term, 3-0-0). [Strategic Training Fellow in Cardiovascular Research Tomorrow's Research Cardiovascular Health Professionals (TORCH)]. Is a lecture/seminar course designed to provide a comprehensive "hands on" exposure to a variety of research fields including Bio-medical, Clinical, Health Services, Social, Cultural, Environmental and Population Health. This multidisciplinary approach will use seminars, debates, case studies, journal clubs and workshops to develop the skills and knowledge base required to implement collaborative cardiovascular research projects. Seminar topics to include: biostatistics and health economics, congestive heart failure, obesity, new technologies, vascular biology, women's issues in vascular medicine, endothelial dysfunction, and electrophysiology. Prerequisite: Restricted to students who have received consent from TORCH Executive Advisory Committee and the course coordinator.

#### MED 701 Fundamentals for Translational Cardiovascular Clinical Investigations (#2)

★6 (fi 12) (two term, 3-0-0). [Strategic Training Fellow in Cardiovascular Research Tomorrow's Research Cardiovascular Health Professionals (TORCH)]. Is a lecture/seminar course designed to provide a comprehensive "hands on" exposure to a variety of research fields including Bio-medical, Clinical, Health Services, Social, Cultural, Environmental and Population Health. This multidisciplinary approach will use seminars, debates, case studies, journal clubs and workshops to develop the skills and knowledge base required to implement collaborative cardiovascular research projects. Seminar topics to include: stroke, hypertension, congenital heart disease, atherosclerosis, gene therapy, databases, hypertension, stents, MRI principles and the metabolic syndrome. Prerequisite: MED 700.

## Courses Beginning in 2013

#### MED 580 Molecular and Physiological Basis of Heart Disease

★3 (fi 6) (second term, 3-0-0). The fundamental aim of this course is to take a translational aspect to heart disease by exploring the basis of heart structure and function and to understand the molecular and cellular basis for the pathophysiological perturbations in disease states. Students will be exposed to the quantitative and qualitative changes that occur in human heart disease and current potential therapeutic targets. The use of genetically modified animal models of human heart disease will be highlighted. Prerequisite: consent of Department and Undergraduate Exposure to Cardiovascular Physiology.

The most current Course Listing is available on Bear Tracks.

## 231.191 Microbiologie, MICRE

Faculté Saint-Jean

### Cours de 1er cycle

#### MICRE 133 Microbiologie Médicale pour Infirmières

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Cours d'introduction pour les étudiants du BSclnf (bilingue). La première partie du cours se concentre sur les microorganismes, le système immunitaire, l'hygiène en milieu hospitalier, la transmission d'infection, les infections, les antibactériens, la désinfection et la stérilisation. La deuxième partie du cours se concentre sur les organismes pathogènes reliés aux systèmes d'organes et comment ils causent la maladie. Notes: La priorité sera accordée aux étudiants du BSclnf (bilingue). Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MMI 133.

## 231.192 Microbiology (Biological Sciences), MICRB

Department of Biological Sciences  
Faculty of Science

#### Notes

- (1) See the following sections for listings of other Biological Sciences courses: Bioinformatics (BIOIN); Biology (BIOL); Botany (BOT); Entomology (ENT); Genetics (GENET); Zoology (ZOOZ)
- (2) See the following sections for listings of other relevant courses: Interdisciplinary Studies (INT D); Immunology and Infection (IMIN); Marine Science (MA SC); Paleontology (PALEO).

### Undergraduate Courses

#### **O** MICRB 265 General Microbiology

★3 (fi 6) (either term, 3-0-4). This course will focus on the structure and physiology of free-living and pathogenic bacteria. The diversity of their metabolic activities, the interaction of microbes with their environment, symbiotic relationships and cell-to-cell communication are major topics. Lectures and laboratory exercises are coordinated to explore topics in basic microbiology, environmental microbiology, molecular microbiology, and the production of economically or medically important products through microbial biotechnology. Prerequisites: BIOL 107 and CHEM 164 or 261. SCI 100 may be used in lieu of BIOL 107 and CHEM 261.

#### **O** MICRB 311 Microbial Physiology

★3 (fi 6) (first term, 3-0-0). The structure, growth, and metabolic path-ways used by bacteria, yeasts, and molds. Emphasis is placed on the comparative biochemical aspects of microbial life. Prerequisites: MICRB 265 and BIOCH 200 or 205.

#### **O** MICRB 316 Molecular Microbiology

★3 (fi 6) (second term, 3-0-0). Factors that affect prokaryotic gene expression at the levels of replication, transcription, post-transcriptional and post-translational control. Topics will include mobile genetic elements and their effect on chromosome structure and gene expression; alternate sigma factors; protein modification and degradation; RNA structure, processing and decay; and DNA modification and rearrangement in gene control. Prerequisites: GENET 270, MICRB 265 and BIOCH 203/205 or BIOCH 200. Note: MICRB 316 and 516 cannot both be taken for credit.

#### MICRB 343 Analysis of Microbial Macromolecules

★3 (fi 6) (second term, 3-0-0). Description and critical discussion of current techniques used for the isolation and characterization of macromolecular constituents of prokaryotic cells with emphasis on proteins. Prerequisites: MICRB 311 or consent of instructor.

#### MICRB 345 Microbial Laboratory Techniques

★3 (fi 6) (second term, 0-0-8). A series of laboratory projects employing current techniques used in the isolation and characterization of macromolecular constituents of prokaryotic cells. Prerequisite: BIOL 391 (or consent of instructor); Corequisite or Prerequisite: MICRB 343. Credit may not be obtained for both MICRB 344 and 345.

#### MICRB 410 Structure of Microorganisms

★3 (fi 6) (second term, 3-0-0). Cellular structure of prokaryotes with particular emphasis on cell wall active antibiotics and experimental methodologies. Prerequisite: MICRB 311. Note: MICRB 410 and 510 cannot both be taken for credit.

#### MICRB 415 Industrial Microbiology

★3 (fi 6) (first term, 3-0-0). Microbial production of commercially important metabolites and products. Emphasis will be placed on control and regulation of metabolic pathways involved in the production of these microbial products and the use of genetic manipulation to improve production levels. Prerequisites: GENET 270 and MICRB 311.

#### MICRB 450 Fermentation Biotechnology

★3 (fi 6) (first term, 0-0-6). Involves a series of laboratory exercises designed



to give students hands-on experience with the cultivation of various microbes at large scale. Students are responsible for all stages of the cultivation process, from medium preparation through inoculum development to harvesting and downstream processing, and so work at times outside of the scheduled laboratory period is required. Corequisite: MICRB 415 or consent of instructor.

#### **MICRB 470 Advanced Microbial Genetics**

★3 (*fi 6*) (first term, 1-0-3). This advanced course will introduce students to detailed aspects of bacterial genetics. Topics to be covered include genetic mutation, genome organization, DNA movement, and mobile genetic elements such as plasmids, transposons, and bacteriophages. The laboratory component will introduce students to methods involving the use of classical and modern molecular genetics for the characterization of bacterial mutants, as well as approaches for investigating various prokaryotic molecular mechanisms. Prerequisites: MICRB 265, MICRB 316 or GENET 304, and consent of instructor.

#### **MICRB 491 Environmental Microbiology**

★3 (*fi 6*) (first term, 3-0-0). Interactions between microorganisms and the environment. Topics include methods of sampling various environments, methods for monitoring microbial activities, petroleum microbiology, bioremediation, survival of airborne microorganisms, microbial metabolism of selected pollutants. Prerequisite: MICRB 265, corequisite: a 300-level Biological Sciences course or consent of Instructor. Note: Credit can be received in only one of MICRB 391, 491 and 591.

#### **MICRB 492 Laboratory Methods for Environmental Microbiology**

★3 (*fi 6*) (second term, 0-0-6). Laboratory experiments evaluate methods for enumerating bacteria from aquatic environments and introduce methods for monitoring their metabolic activities. Factors that influence petroleum biodegradation and comparisons of methods for sampling airborne microorganisms are also studied. Strong emphasis on statistical analysis of numerical data obtained. Pre- or corequisite: MICRB 491. MICRB 392 and 492 cannot both be taken for credit.

**Note:** For other Immunology courses not listed above, see MMI listing.

## Graduate Courses

### Notes

- (1) All 300- and 400-level courses in the Department of Biological Sciences may be taken for credit (except for BIOL 490, 498 and 499) by graduate students with approval of the student's supervisor or supervisory committee.
- (2) The following courses may be taken as an option in graduate programs in the Department of Biological Sciences with approval of the student's supervisor or supervisory committee: BIOCH 510, 520, 530, 541, 550, 555, 560; CHEM 361, 363, 461; CELL 300, 301; ENCS 510; IMIN 371, 372, 452, 501; MA SC 400, 401, 402, 410, 412, 420, 425, 430, 437, 440, 445, 470, 480; MMI 405, 415; NEURO 472; NU FS 363; PALEO 418, 419; PHARM 601.

#### **MICRB 510 Advanced Topics in Microbial Structure**

★3 (*fi 6*) (second term, 3-0-0). Lecture course on cellular structure of prokaryotes with particular emphasis on experimental methodologies. Oral presentations are required. Prerequisite: consent of instructor. Credit cannot be obtained for both MICRB 410 and 510.

#### **MICRB 514 Advanced Topics in Microbiology**

★3 (*fi 6*) (second term, 3-0-0). Critical reading and discussion of scientific literature. Students will present scientific articles for group discussion and will also prepare a major literature review in their field of study. Topics covered will vary from year to year. Prerequisite: consent of instructor.

#### **MICRB 516 Advanced Molecular Microbiology**

★3 (*fi 6*) (second term, 3-0-0). Lecture course on molecular mechanisms relating to gene expression of prokaryotes based on the current literature. In addition, students will prepare an analytical literature review on a chosen topic relating to this field. Prerequisite: consent of the instructor. Credit cannot be obtained for both MICRB 316 and 516.

#### **MICRB 591 Advanced Environmental Microbiology**

★3 (*fi 6*) (first term, 3-0-0). Interactions between microorganisms and their environment. Topics include methods of sampling various environments, methods for monitoring microbial activities, petroleum microbiology, bioremediation, survival of airborne microorganisms, microbial metabolism of selected pollutants. Lectures and exams are the same as MICRB 491, but preparation of a major term paper and an oral presentation are required. Prerequisite: consent of instructor. Credit cannot be obtained for both MICRB 491 and 591.

#### **MICRB 606 Microbiology Seminar**

★3 (*fi 6*) (either term, 0-3s-0). Intended for all Microbiology and Biotechnology graduate students, except those in their second year who should register for MICRB 607. Credit may be obtained more than once.

#### **MICRB 607 Microbiology Seminar**

★3 (*fi 6*) (either term, 0-3s-0). Graded seminar course intended for second-year graduate students.

The most current Course Listing is available on Bear Tracks.

## 231.193 Middle Eastern and African Studies, MEAS

Office of Interdisciplinary Studies  
Faculty of Arts

### Undergraduate Courses

#### **MEAS 200 Introduction to Middle Eastern and African Studies**

★3 (*fi 6*) (either term, 0-3s-0). Explores conceptual framework and interdisciplinary tools for understanding Middle East and Africa as geographical and intellectual space.

#### **MEAS 300 Themes and Topics I**

★3 (*fi 6*) (either term, 3-0-0).

#### **MEAS 301 Themes and Topics II**

★3 (*fi 6*) (either term, 3-0-0).

#### **MEAS 310 Religion and Politics in the Middle East and North Africa**

★3 (*fi 6*) (either term, 3-0-0). This course examines the complex issues that derive from religion and politics in the formation of modern nation states across the contemporary Middle East and North Africa.

#### **MEAS 320 Muslim Societies in the Middle East and Africa**

★3 (*fi 6*) (either term, 3-0-0). This course takes a comparative approach to understanding development of societies that share Islam as a religion and culture, in the larger context of developing relations with the West. Specific topical, chronological and geographical focus will vary.

#### **MEAS 325 Colonialism and Populism in the Middle East and Africa**

★3 (*fi 6*) (either term, 3-0-0). Comparing the colonial, national liberation, and populist moments in the Middle East and Africa.

#### **MEAS 330 Cultural Representations of Post-coloniality**

★3 (*fi 6*) (either term, 3-0-0). Questioning identity in the post-colonial Middle East and Africa through expressive forms (literature, visual and performing arts, political cartoons, cinema, advertising, and other popular media).

#### **MEAS 400 Topics in the Study of the Middle East and Africa**

★3 (*fi 6*) (either term, 0-3s-0). Explores themes and issues central to what unifies and divides the Middle East and Africa. Exploits interdisciplinarity as a tool to deepen methodological and theoretical understanding.

#### **MEAS 401 Themes and Topics**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: any MEAS 300-level course or permission of Program Coordinator.

#### **MEAS 475 Methodology in Middle Eastern and African Studies**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: consent of the Program Coordinator.

#### **MEAS 480 Directed Reading in Middle Eastern and African Studies**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: consent of Program.

#### **MEAS 499 Honors Essay in Middle Eastern and African Studies**

★6 (*fi 12*) (two term, 0-3s-0). Preparation of the Honors Essay. Prerequisite: MEAS 475

### Graduate Courses

#### **MEAS 500 Topics in Comparative Interdisciplinary Research in Middle Eastern and African Studies**

★3 (*fi 6*) (either term, 0-3s-0). Topics vary by instructor.

#### **MEAS 521 Directed Reading in Middle Eastern and African Studies Research**

★3 (*fi 6*) (either term, 0-3s-0). Topics vary by student need and/or instructor interest. Intended to complement MEAS 500.

## 231.194 Mining Engineering, MIN E

School of Mining and Petroleum Engineering  
Department of Civil and Environmental Engineering  
Faculty of Engineering

**Note:** See also Materials Engineering (MATE); Mining and Petroleum Engineering (MPE); and Petroleum Engineering (PET E) listings.

### Undergraduate Courses

#### **MIN E 295 Introduction to Mining Engineering**

★3.8 (*fi 6*) (either term, 3-0-3/2). Mining concepts and terminology, company operations, stages of mining, unit mining operations, surface and underground mine development and methods, feasibility studies and mine costs, ethics, equity, sustainable development and environmental stewardship, public and worker safety

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and health considerations including the context of the Alberta Occupational Health and Safety Act.

#### MIN E 310 Ore Reserve Estimation

★4.5 (fi 6) (either term, 3-0-3). Conventional and geostatistical methods for construction of orebody models. Contouring techniques for mapping bounding surfaces of stratigraphic layers. Coordinate transforms and geometric techniques. Estimation and simulation methods for characterizing ore grade variability. Ore reserve classification, uncertainty assessment, mine selectivity, and grade control. Corequisites: MATH 209 and EAS 210.

#### MIN E 323 Rock Mechanics

★4.5 (fi 6) (first term, 3-0-3). Mechanical properties of rock masses, field and laboratory determination; classification and index testing; permeability and flow; stresses around underground openings, elastic prototypes and numerical methods; ground support principles and mechanics of common support systems, loads on supports; hydraulic backfill, earth pressures, consolidation theory and practical consequences in mining; mechanics of subsidence and caving; rockburst mechanics; slope stability, rock mechanics instrumentation. Prerequisite: CIV E 270 or consent of Instructor.

#### MIN E 324 Drilling, Blasting, and Explosives

★3 (fi 6) (either term, 3-0-0). Drilling methods, breakage mechanics, performance, and equipment. Explosive characteristics, initiation systems, selection, handling, and loading. Blasting, rock dynamics, design of surface and underground blasts, fragmentation prediction, vibrations and damage control, monitoring. Prerequisite: MIN E 295 or consent of Instructor.

#### MIN E 325 Mine Planning and Design

★4.5 (fi 6) (either term, 3-0-3). Introduction to mine planning and design using standard software tools. Geological and economic block models; open pit mine layout and planning requirements; pit limit optimization; haul road design; pit and waste dump design; long and short-term mine production scheduling; cut-off grade optimization. Prerequisites: MIN E 295, CIV E 265, MIN E 310.

#### MIN E 330 Mine Transport and Plant Engineering

★3.8 (fi 6) (either term, 3-3s/2-0). Covers underground and surface mine transport systems, rail haulage, hoisting, conveying and slurry pipelining. Auxiliary mining services such as electric power distribution, pumping and compressed air power. Seminars will include design problems dealing with the materials taught in the classroom. Oral presentation is required. Prerequisites: MIN E 295 and E E 239 or consent of Instructor.

#### MIN E 402 Mine Design Project I

★4 (fi 6) (first term, 1-0-6). First phase of a full Prefeasibility Study of a commercial mining property. Data collection, preparation of geological model using commercially available software. Calculate reserves and prepare plans and sections. Prepare geotechnical, hydrogeological, hydrological sections and review and identify conceptual mining methods for development in Mine Design Project II, (see MIN E 403). Prepare report. Present report at seminar. Weekly session (one hour) with project supervisor. Prerequisites or corequisites: MIN E 310, MIN E 325, MIN E 413 and MIN E 414 or consent of instructor.

#### MIN E 403 Mine Design Project II

★4 (fi 6) (second term, 1-0-6). Second phase of a full Prefeasibility Study of a commercial mining property. This phase follows on from Phase I (MIN E 402) requiring the development of marketing plans, detailed mine plans and equipment selection, environmental aspects, capital and operating cost estimates and financial and economic analyses. Prepare report. Submit report and present at seminar. Weekly session (one hour) with project supervisor. Prerequisite: MIN E 402.

#### MIN E 407 Principles of Mine Ventilation

★3.8 (fi 6) (either term, 3-0-3/2). Principles and practices of underground total air conditioning. Control of quantity, quality, and temperature-humidity of the underground mines. Design and analyses of mine ventilation networks. Theory and applications of fans to mine ventilation systems. Ventilation planning and overall system design. Prerequisite: CIV E 330 and MIN E 414. Corequisite: MIN E 422.

#### MIN E 408 Mining Enterprise Economics

★3 (fi 6) (either term, 2-0-2). Fundamentals of economic evaluation. Cost estimation, commodity price modelling and revenue forecasts and taxation related to mine development. Economic evaluation of mining ventures, profitability, risks and uncertainty analyses. Commodity markets and mine management strategies. Weekly laboratory/tutorial sessions will address case studies and specific problems. Prerequisites: ENG M 310 or 401, STAT 235 or consent of Instructor.

#### MIN E 413 Surface Mining and Waste Management

★3.8 (fi 6) (first term, 3-0-3/2). Cyclic and continuous surface mining methods. Production and productivity considering the generation of mine specific landform structures. Design for closure with consideration of mining and environmental legislation, waste streams, acid rock drainage, emissions and effluent treatment. Reclamation, restoration and rehabilitation. Prerequisites: MIN E 310, 330, 323, and 325 or consent of Instructor.

#### MIN E 414 Underground Mining Methods

★3.8 (fi 6) (first term, 3-0-3/2). Underground mining methods; Equipment types; specification and operation, mine organization, labor productivity, cost estimating

and cost control. Methods studied include room-and-pillar, sublevel stoping and caving, vertical crater retreat, block caving, selective methods for vein mines, and underground coal mining systems. Prerequisites: MIN E 323, MIN E 324 and MIN E 325 or consent of Instructor.

#### MIN E 420 Mine Equipment Selection and Maintenance

★3 (fi 6) (second term, 3-0-0). Introduction to the principles of equipment selection and maintenance practice. Selected issues of machine and component longevity, wear, service and optimization for both surface and underground equipment. Prerequisites: CIV E 270, MIN E 413, 414 or consent of Instructor.

#### MIN E 422 Environmental Impact of Mining Activities

★2.5 (fi 4) (second term, 2-1s-0). Environmental impact of mining projects and activities. Topics include: environmental impact assessment (EIA) processes, sustainable development, mine closure, reclamation planning, social responsibility of mining, regulations, guidelines, surface subsidence, tailings disposal, erosion and acid rock drainage. Corequisite: MIN E 413.

#### MIN E 428 Mining Field Trip

★2 (fi 4) (Spring/Summer, 0-4s-0). An extended trip to visit surface and underground mines is made every year by students entering third or fourth year Mining Engineering, accompanied by staff. A report on the trip is to be submitted. All Mining students may be required to make other field trips during the sessions. Prerequisite: MIN E 295.

#### MIN E 555 Special Topics in Mining Engineering

★3 (fi 6) (either term, 3-0-0). Research studies and/or projects dealing with selected metal, nonmetal and coal mining subjects. Suitable subjects are chosen in consultation with a mining engineering faculty member. Typical study categories are reserve evaluation, surface and underground mining methods and operations, mine planning, computer simulation of mining operations, mineral processing, ventilation, regulations, mine safety, feasibility studies, economics and management. Prerequisite: consent of Instructor

## Graduate Courses

#### MIN E 612 Principles of Geostatistics

★3.5 (fi 6) (either term, 3-1s-0). Geostatistical methods are presented for characterizing the spatial distribution of regionalized variables. The theory of random variables and multivariate spatial distributions is developed. This class focuses on the quantification of spatial variability with variograms, estimation with kriging, and simulation with Gaussian techniques.

#### MIN E 613 Non-Parametric and Multivariate Geostatistics

★3.5 (fi 6) (either term, 3-1s-0). Cell based methods for geology modeling, including indicator formalism for categorical data and truncated Gaussian simulation. Object based and process-based approaches for fluvial reservoirs. Indicators for continuous variable estimation and simulation. Multivariate geostatistics including models of coregionalization, cokriging, Gaussian cosimulation, Markov-Bayes simulation and multivariate data transformation approaches. Introduction to advanced simulation approaches including direct simulation, simulated annealing and multiple point simulation. Prerequisite: Consent of instructor.

#### MIN E 614 Risk Management with Geostatistics

★3 (fi 6) (either term, 3-1s-0). Advanced methods for the modeling of heterogeneity, quantification of uncertainty and management of risk. The theory and place of historical and advanced methods in geostatistics. Matrix methods, alternative variogram measures, kriging with a trend, dual kriging, spectral simulation, direct simulation and multiple point statistics.

#### MIN E 615 Application of Geostatistics

★3 (fi 6) (either term, 3-1s-0). Public domain and commercial software are reviewed for geostatistical modeling. Special projects in petroleum, mining, environmental and other areas will be undertaken.

#### MIN E 620 Rock Mechanics

★4 (fi 6) (either term, 3-1s-1). Properties of intact rocks and testing methods. Properties of rock masses and rock mass classifications. Rock and rock mass strength criteria. Stresses in rock masses. Analysis of rock mass performance, rock support and stabilization. Empirical, analytical and numerical analysis techniques. Surface and underground rock engineering case studies Prerequisite: Consent of Instructor.

#### MIN E 622 Mining Equipment Design, Benchmarking and Performance

★3.5 (fi 6) (either term, 3-1s-0). A study of selected surface and underground mining equipment designs, enhancements and appropriateness for operation within given mining conditions. Strategies for machine dynamic performance benchmarking and evaluation, as tools for planning, maintenance and operations scheduling are considered for good and poor operating environments. Prerequisite: consent of Instructor.

#### MIN E 623 Rock Slope Stability in Surface Mining

★3.5 (fi 6) (either term, 3-1s-0). Economic, operational and geological factors affecting slope design. Design stages; collection of structural and strength data. Data synthesis, interpretation, design values. Methods of design, deterministic and

probabilistic methods. Bench design. Controlled blasting; stabilization techniques. Monitoring. Spoil pile stability. Prerequisite: MIN E 323 or equivalent.

#### MIN E 630 Advanced Mine Transport

★3.5 (fi 6) (either term, 3-1s-0). Advanced studies in the methods and systems of material movement in mines. In-depth consideration of selection, specifications, and costs of transportation for surface and underground mines. Prerequisites: MIN E 330 and 413, or 414, or consent of Instructor.

#### MIN E 631 Surface Mine Design and Optimization

★3.5 (fi 6) (either term, 3-1s-0). Surface mining methods, mechanics of surface mine layouts design, haul roads design, waste dump design, theory of Lerchs-Grossman's, floating cone, conditional simulation, neural network and heuristic algorithms for surface mine optimization. Large scale applications of these algorithms for designing and optimizing surface mine layouts and subsequent advance mining systems design. Students undertake design projects under Instructor's direction. Prerequisites: MIN E 413 or consent of Instructor.

#### MIN E 632 Mining Equipment Engineering and Management

★3.5 (fi 6) (either term, 3-1s-0). Surface and underground mining equipment engineering and management approaches are investigated. Use of the observational method to equipment management is introduced. Theory and application of planning, operations and maintenance strategies will be discussed with appropriate case studies. Students undertake retrofit and/or hybrid design assignments for selected equipment operational issues. Prerequisite: MIN E 520, MIN E 622 or consent of Instructor.

#### MIN E 640 Simulation of Industrial Systems

★3.5 (fi 6) (either term, 3-1s-0). Formulation of models of engineering problems and industrial systems for experimentation using a general purpose simulation language. Statistical and operational validation of simulation results. Prerequisite: consent of Instructor.

#### MIN E 641 Discrete-Event Simulation

★3.5 (fi 6) (either term, 3-1s-0). Fundamentals of discrete-event simulation modelling and its industrial applications. Theoretical and statistical aspects of simulation, including input analysis, random number generation, experimental design, and variance reduction techniques. Arena Simulation Environment used for explaining simulation concepts.

#### MIN E 650 Special Topics in Mining Engineering

★3 (fi 6) (either term, 3-0-0). Special studies of developments of current interest within the mining industry in exploration, mining methods, mine planning, mine simulation, environment, regulations, economics and management; e.g. tar sands mining, ocean mining, in situ gasification.

#### MIN E 685 Advanced Energy and Mineral Economics

★3 (fi 6) (either term, 3-0-0). Application of advanced statistical and probability theory in mineral resource investment risk and uncertainty analysis in random multivariable states. Numerical modelling of mineral resource stochastic processes using derivative mine valuation concepts. Case studies include application of simulation and numerical modelling packages for mineral resources, coal and oil and gas properties analysis. Prerequisite: consent of Instructor.

#### MIN E 710 Mining

★3 (fi 6) (either term, 3-0-0). Readings and discussion of selected topics in mining engineering.

#### MIN E 900 Directed Research

★3 (fi 6) (either term, unassigned). An engineering project for students registered in a Masters of Engineering program.

#### MIN E 910 Directed Research

★6 (fi 12) (variable, unassigned). An engineering project for students registered in the joint MBA/MEng program.

## 231.195 Modern Languages and Cultural Studies, MLCS

Department of Modern Languages and Cultural Studies  
Faculty of Arts

### Undergraduate Courses

#### MLCS 201 Reading European Cultures

★3 (fi 6) (either term, 3-0-0). Basic questions of culture in Europe, their common denominator, and historical foundations from the Middle Ages to the present.

#### MLCS 204 Forms of Folklore

★3 (fi 6) (either term, 3-0-0).

#### MLCS 205 History of Folklore Studies

★3 (fi 6) (either term, 3-0-0). History, concepts, and practices of Folklore.

#### MLCS 210 Language(s) of Culture

★3 (fi 6) (either term, 3-0-0). Introduction to the major issues within the discipline

of Cultural Studies from an international perspective, and provision of the necessary terminology and theoretical tools for examining general topics and case studies with emphasis on the question of languages.

#### MLCS 215 Contemporary Literature and Film in Central and Eastern Europe

★3 (fi 6) (either term, 3-0-0). Fiction and essays from the 1970-90's.

#### MLCS 231 Language and Power

★3 (fi 6) (either term, 3-0-0). How language, both spoken and written, creates and sustains economic, social, and political power.

#### MLCS 241 Images Across Cultures

★3 (fi 6) (either term, 3-0-0). Introduction to critical theories of the image drawing from different cultural contexts.

#### MLCS 300 Introduction to Translation

★3 (fi 6) (either term, 3-0-0). Translation problems and strategies illustrated with examples from a variety of languages. Prerequisite: ★6 in a foreign language at the 150-level or above.

#### MLCS 305 Carnival

★3 (fi 6) (either term, 3-0-0). Practices throughout the world.

#### MLCS 311 Russia and its Neighbours: Nations in Dialogue and Conflict

★3 (fi 6) (either term, 3-0-0). Cultural and political relations between Russia and the West, with emphasis on the Soviet period since 1945 and after perestroika.

#### MLCS 312 Russian and Non-Russian Cultural and Political Space

★3 (fi 6) (either term, 3-0-0). Cultural and political relations between Russian and non-Russian components of the Imperial and Soviet empires, and between their equivalents in the successor states. Identity, cultural formation, metahistory.

#### MLCS 321 Topics in History of Language: The Origin and Development of Germanic, Romance, Slavic

★3 (fi 6) (either term, 3-0-0). A survey of the historical development of the Germanic, Romance, and Slavic language families from their Proto-Indo-European beginnings to the medieval and early modern era. Prerequisite: ★6 at the 200-level or above in a language taught in Modern Languages and Cultural Studies, or consent of the Department.

#### MLCS 325 Cold War Culture

★3 (fi 6) (either term, 3-0-0). Prerequisite: Consent of the Department.

#### MLCS 341 Images Between Media and Cultures

★3 (fi 6) (either term, 3-0-0). Critical theories of the image applied to a variety of media (including visual art, new technology, film, etc) in different cultural contexts. Prerequisite: MLCS 241 or consent of Department.

#### MLCS 371 Cultural Studies and Applied Linguistics

★3 (fi 6) (either term, 3-0-0). Basic concepts in cultural studies and linguistics applied to the analysis of a specific text genre in different cultures. Prerequisite: ★6 at the 200-level or above in any language other than English.

#### MLCS 380 European Modernism

★3 (fi 6) (either term, 3-0-0). Modernism as a cultural and literary movement in the first decades of the 20th century, examined from transnational and transdisciplinary perspectives. Prerequisite: consent of the Department.

#### MLCS 399 Special Topics

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

#### MLCS 400 The History of Translation

★3 (fi 6) (either term, 3-0-0). A broad historical perspective on the contributions made by translators to the intellectual and cultural history of the world through consideration of the Germanic, Romance and Slavic traditions. The role of the translator and basic principles governing the various traditions are examined to gain insight into different types of translation (religious, literary, technical) and significant moments in the history of translation. Prerequisite: ★6 in a Language Other than English at the 200-level or above or consent of Department.

#### MLCS 405 Contemporary Folklore Scholarship and Canadian Folklore

★3 (fi 6) (either term, 3-0-0).

#### MLCS 431 Mysticism in Literature and the Arts: East and West

★3 (fi 6) (either term, 3-0-0). Exploration of mysticism from a historical perspective that embraces theological and philosophical discourses, as well as psychological approaches. Prerequisite: ★6 at the 300-level or above, of which ★3 must be in Religious Studies (RELIG) or a language taught in Modern Languages and Cultural Studies or consent of the Department.

#### MLCS 441 The Capital City in Language, Literature, and Visual Culture

★3 (fi 6) (either term, 3-0-0). Examines the notion of the capital city as it is represented in different national cultures. Prerequisite: ★6 at the 300-level, of which ★3 must be in a language taught in Modern Languages and Cultural Studies.

#### MLCS 451 Faust and his Brothers

★3 (fi 6) (either term, 3-0-0). Traces the literary formation of the Faust-figure from the late Middle Age chapbook to present depictions of human struggle



with the meaning of life and the quest for fulfillment. International works used to demonstrate the history of a theme and the theory of intertextuality. Prerequisite: consent of the Department.

#### **MLCS 461 The Cultures of the Avant-Garde**

★3 (fi 6) (either term, 3-0-0). The literary and artistic avant-garde in Germanic, Romance and Slavic cultures, circa 1900-1930. Prerequisite: ★6 at the 300-level or above, of which ★3 must be in a language taught in Modern Languages and Cultural Studies.

#### **MLCS 472 Language Use and Cross-Cultural Relations**

★3 (fi 6) (either term, 0-3s-0). Study of social phenomena from a cross-cultural perspective through discourse analysis. Prerequisite: ★6 at the 300-level, of which ★3 must be in a language taught in Modern Languages and Cultural Studies, or consent of Department.

#### **MLCS 473 Cultural Representations, World Media and Ethics**

★3 (fi 6) (either term, 0-3s-0). A discursive approach to the study of cultural representations and ethical issues in world media. Prerequisite: ★6 at the 300-level, of which ★3 must be in a language taught in Modern Languages and Cultural Studies, or consent of Department.

#### **MLCS 474 Applied Linguistics for Community Practice**

★3 (fi 6) (either term, 3-0-0). Prerequisite: Consent of Department.

#### **MLCS 475 X-Rated: Sex on Screen**

★3 (fi 6) (either term, 3-0-0). Considers the representation of the sex act captured on film, video, and other forms of moving pictures. Interrogating notions of acceptability, the popular, high art, exploitation and industry machinery. Prerequisite: Consent of the Department.

#### **MLCS 499 Special Topics**

★3 (fi 6) (either term, 3-0-0).

### Graduate Courses

#### **MLCS 500 History of Translation**

★3 (fi 6) (either term, 3-0-0).

#### **MLCS 507 Topics in Major Contemporary Currents in Literary and Cultural Theory**

★3 (fi 6) (either term, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English. Note: This course is equivalent to C LIT 507 and EASIA 507.

#### **MLCS 531 Mysticism in Literature and the Arts: East and West**

★3 (fi 6) (either term, 3-0-0). Exploration of mysticism from a historical perspective that embraces theological and philosophical discourses, as well as psychological approaches. Prerequisite: consent of Department.

#### **MLCS 541 The Capital City in Language, Literature, and Visual Culture**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

#### **MLCS 555 Teaching Strategies for Postsecondary Language Instructors**

★3 (fi 6) (either term, 3-0-0). Designed to help graduate teaching assistants to develop practical expertise in language instruction at the college and university levels. Prerequisite: consent of Department.

#### **MLCS 561 The Cultures of the Avant-Garde**

★3 (fi 6) (either term, 3-0-0). The literary and artistic avant-garde in Germanic, Romance and Slavic cultures, circa 1900 to 1930. Prerequisite: consent of Department.

#### **MLCS 570 Applied Linguistics**

★3 (fi 6) (either term, 3-0-0). Applied linguistics, including second language acquisition, sociolinguistics, discourse analysis, second language pedagogy, and bilingualism.

#### **MLCS 572 Language Use and Cross-Cultural Relations**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

#### **MLCS 573 Cultural Representations, World Media and Ethics**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

#### **MLCS 574 Applied Linguistics for Community Practice**

★3 (fi 6) (either term, 3-0-0). Prerequisite: Consent of Department.

#### **MLCS 581 Applied Linguistics: Second Language Research**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

#### **MLCS 582 Applied Linguistics: Sociolinguistics**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

#### **MLCS 583 Applied Linguistics: Discourse Analysis**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

#### **MLCS 599 Directed Reading**

★3 (fi 6) (either term, 3-0-0).

#### **MLCS 600 Translation Theories**

★3 (fi 6) (either term, 3-0-0). The multiple ways in which linguistics, literary

criticism, philosophy, cultural theories and feminist theories have informed the practice of translation and contributed to the production of different translation theories. In their presentations and papers, students are encouraged to use examples taken from languages with which they are familiar.

#### **MLCS 601 Special Topics in Translation**

★3 (fi 6) (either term, 3-0-0).

#### **MLCS 610 Practical Workshop in Literary Translation**

★3 (fi 6) (either term, 3-0-0). The practice of literary translation from a variety of foreign languages. Prerequisite: Consent of Department.

#### **MLCS 631 Folklore Theory Studies**

★3 (fi 6) (either term, 3-0-0).

#### **MLCS 632 Folklore Research Methods**

★3 (fi 6) (either term, 3-0-0).

#### **MLCS 698 Topics in Applied Linguistics**

★3 (fi 6) (either term, 3-0-0).

#### **MLCS 699 Topics in Literary and Cultural Studies**

★3 (fi 6) (either term, 3-0-0).

#### **MLCS 900 Directed Research Project**

★6 (fi 12) (variable, unassigned).

#### **MLCS 901 MA Research Project**

★3 (fi 6) (either term, 3-0-0).

## 231.196 Music, MUSIC

Department of Music  
Faculty of Arts

**Note:** The ability to read music is required for all courses numbered 207 and greater except MUSIC 248, 348, 448, and 548.

### Undergraduate Courses

#### **MUSIC 100 Rudiments of Music**

★3 (fi 6) (either term, 3-0-0). Fundamentals of music theory approached through aural and written training. Note: Not available for degree credit to students enrolled in a BMus (all routes) degree program.

#### **O MUSIC 101 Introduction to Western Art Music**

★3 (fi 6) (either term, 3-0-0). A study of music literature with an emphasis on listening and analytical tools. A brief survey of the history of Western music will be included. Not available for degree credit to BMus (all routes) students.

#### **MUSIC 102 Introduction to World Music**

★3 (fi 6) (either term, 3-0-0). Not available to students with credit in MUSIC 165.

#### **O MUSIC 103 Introduction to Popular Music**

★3 (fi 6) (either term, 3-0-0). A survey of popular music's development as a category of musical and cultural practice, an industry and an object of study, during the twentieth century.

#### **MUSIC 122 Second Practical Subject**

★3 (fi 9) (two term, 0.5-0-0). Restricted to BMus (all routes), BMus/BEEd, and BEEd students majoring in secondary music education. Twenty-six half-hour lessons for two terms. Prerequisite: consent of Department.

#### **MUSIC 124 Applied Music**

★3 (fi 9) (either term, 1-0-0). For non-BMus students. Thirteen one-hour lessons for one term. Prerequisite: consent of Department, based on audition.

#### **MUSIC 125 Applied Music**

★6 (fi 15) (two term, 2-0-0). Restricted to BMus (all routes) and BMus/BEEd students.

#### **MUSIC 126 Applied Music**

★3 (fi 9) (two term, 0.5-0-0). For non-BMus students. Twenty-six half-hour lessons for two terms. Prerequisite: consent of Department, based on audition.

#### **MUSIC 127 Applied Music**

★6 (fi 15) (two term, 1-0-0). For non-BMus students. Twenty-six one-hour lessons for two terms. Prerequisite: consent of Department, based on audition.

#### **MUSIC 129 Fundamental Keyboard Skills**

★3 (fi 6) (two term, 0-2L-0). Prerequisite: consent of Department. Restricted to BMus (all routes), BMus/BEEd, and BA (Honors) Music Major students.

#### **MUSIC 132 Second Practical Subject**

★3 (fi 9) (either term, 1-0-0). Restricted to BMus (all routes), BMus/BEEd, and BEEd students majoring in secondary music education. Thirteen one-hour lessons for one term. Prerequisite: consent of Department.

**MUSIC 140 Choral Ensemble**

★3 (fi 6) (two term, 0-4L-0). Concert Choir or Madrigal Singers. Prerequisite: consent of Department, based on audition.

**MUSIC 141 Instrumental Ensemble**

★3 (fi 6) (two term, 0-4L-0). Wind Ensemble, University Symphony Orchestra, or Concert Band. Prerequisite: consent of Department based on audition.

**MUSIC 143 Indian Music Ensemble I**

★3 (fi 6) (two term, 0-4L-0). The classical music of India, through group instruction in singing, tabla (drums), sitar (plucked lute), sarangi (bowed lute), bansuri (flute), harmonium, and ensemble performance. A set of instruments will be available. The ability to read music is not required. Prerequisite: consent of Department.

**MUSIC 144 West African Music Ensemble I**

★3 (fi 6) (two term, 0-4L-0). Polyphonic and polyrhythmic music of West Africa, primarily through ensemble performance of the percussion and vocal music of the Ewe people of Ghana. A set of Ewe percussion instruments will be available. The ability to read music is not required. Prerequisite: consent of Department.

**MUSIC 148 Middle Eastern and North African Music Ensemble I**

★3 (fi 6) (two term, 0-4L-0). The study of Middle Eastern and North African vocal and instrumental music (primarily Arab, Persian, and Turkish musical traditions) through group instruction and ensemble performance. No formal musical training (e.g., the ability to read music or instrumental competency) is required. Some traditional instruments will be available. Prerequisite: consent of the Department.

**MUSIC 149 Jazz Ensembles**

★3 (fi 6) (two term, 0-4L-0). Happnin' Jazz Choir, Jazz Band I, or Jazz Band II. Prerequisite: consent of Department based on audition.

**MUSIC 151 Aural and Keyboard Skills I**

★3 (fi 6) (two term, 0-3L-0). The development of basic musicianship skills through dictation and performance of pitch, rhythmic, and keyboard exercises. Prerequisite: MUSIC 100 or satisfactory completion of Department of Music Theory Placement Exam and Aural Skills Exam for other than BMus students. Corequisite: MUSIC 155 or 156. Restricted to BMus (all routes), BMus/BEEd, BEEd Music Major/Minor, BA (Honors) Music Major, and BA Music Major/Minor students.

**MUSIC 155 Music Theory I**

★3 (fi 6) (either term, 3-0-0). Diatonic harmony and voice leading; elementary analysis. Prerequisite: MUSIC 100 or satisfactory completion of Department of Music Theory Placement Examination. Registration priority given to BMus (all routes), BMus/BEEd, BEEd Music Major/Minor, BA (Honors) Music Major, and BA Music Major/Minor students.

**MUSIC 156 Music Theory II**

★3 (fi 6) (either term, 3-0-0). Chromatic harmony and voice leading; analysis. Prerequisite: MUSIC 155. Registration priority given to BMus (all routes), BMus/BEEd, BEEd Music Major/Minor, BA (Honors) Music Major, and BA Music Major/Minor students.

**MUSIC 192 Contemporary Music**

★3 (fi 6) (two term, 0-4L-0). Performance and coaching experience in a range of 20th century and contemporary repertoires. Prerequisite: consent of the Department based on audition.

**MUSIC 193 Experimental Improvisation Ensemble**

★3 (fi 6) (two term, 0-2L-0). Improvised, experimental music explored through creative exercises, group instruction and performance. No formal training is required. Prerequisite: consent of the Department.

**MUSIC 201 Western Music and Contexts**

★3 (fi 6) (either term, 3-0-0). Study of selected works and their significance in a variety of musical, social, and historical contexts. Prerequisite: MUSIC 101 or equivalent. Not available for degree credit to BMus (all routes) students

**MUSIC 203 Issues in Popular Music Studies**

★3 (fi 6) (either term, 3-0-0). Critical study of popular musics in contemporary society, approached through social and cultural theory. Prerequisite: MUSIC 103 or consent of Department.

**MUSIC 206 History of Jazz**

★3 (fi 6) (either term, 3-0-0). Not available to students with credit in MUSIC 313.

**MUSIC 207 Instruments for Children**

★3 (fi 6) (either term, 3-0-0). Laboratory experience with recorder ensemble, small winds, chording and percussion instruments. Prerequisites: MUSIC 150 or 156, and 151.

**MUSIC 213 Woodwind Techniques**

★3 (fi 6) (either term, 3-1L-0). Introduction to woodwind instruments for music educators. Prerequisite: Music 150 or 156 and 151. Corequisite or prerequisite: Music 121 or 125, or 124 or equivalent. NOTE: Restricted to BMus (all routes), BMus/BEEd Music Major/Minor, and BA (Honors) Music Major students.

**MUSIC 214 Brass Techniques**

★3 (fi 6) (either term, 3-1L-0). Introduction to brass instruments for music educators. Prerequisite: Music 150 or 156 and 151 or equivalent. Corequisite or prerequisite: Music 121 or 125, or 124 or equivalent. NOTE: Restricted to BMus (all routes), BMus/BEEd Music Major/Minor, and BA (Honors) Music Major students.

**MUSIC 215 Percussion Techniques**

★3 (fi 6) (either term, 3-1L-0). Introduction to percussion and rhythm section instruments for music educators. Prerequisite: Music 150 or 156 and 151. Corequisite or prerequisite: Music 121 or 125, or 124 or equivalent. NOTE: Restricted to BMus (all routes), BMus/BEEd Music Major/Minor, and BA (Honors) Music Major students.

**MUSIC 222 Second Practical Subject**

★3 (fi 9) (two term, 0.5-0-0). Restricted to BMus (all routes), BMus/BEEd, and BEEd students majoring in secondary music education. Twenty-six half-hour lessons for two terms. Prerequisite: consent of Department.

**MUSIC 224 Applied Music**

★3 (fi 9) (either term, 1-0-0). For non-BMus students. Thirteen one-hour lessons for one term. Prerequisites: MUSIC 121 or 125, or 124 or equivalent and consent of Department.

**MUSIC 225 Applied Music**

★6 (fi 15) (two term, 2-0-0). Restricted to BMus (all routes) and BMus/BEEd students. Prerequisite: MUSIC 121 or 125, or 124 or equivalent.

**MUSIC 226 Applied Music**

★3 (fi 9) (two term, 0.5-0-0). For non-BMus students. Twenty-six half-hour lessons for two terms. Prerequisite: consent of Department, based on audition.

**MUSIC 227 Applied Music**

★6 (fi 15) (two term, 1-0-0). For non-BMus students. Twenty-six one-hour lessons for two terms. Prerequisite: consent of Department, based on audition.

**MUSIC 230 Choral Techniques and Pedagogy**

★3 (fi 6) (first term, 3-0-0). Prerequisites: MUSIC 150 or 156, and 151, or equivalent. Note: Restricted to BMus (all routes), BMus/BEEd, BEEd Music Major/Minor, and BA (Honors) Music Major students.

**MUSIC 232 Second Practical Subject**

★3 (fi 9) (either term, 1-0-0). Restricted to BMus (all routes), BMus/BEEd, and BEEd students majoring in secondary music education. Thirteen one-hour lessons for one term. Prerequisite: consent of Department.

**MUSIC 239 Vocal and Instrumental Chamber Ensemble**

★3 (fi 6) (two term, 0-2L-0). Prerequisite: consent of Department, based on audition.

**MUSIC 240 Choral Ensemble**

★3 (fi 6) (two term, 0-4L-0). Concert Choir or Madrigal Singers. Prerequisite: consent of Department, based on audition.

**MUSIC 241 Instrumental Ensemble**

★3 (fi 6) (two term, 0-4L-0). Wind Ensemble, University Symphony Orchestra, Concert Band, or Guitar Ensemble. Prerequisite: consent of Department based on audition

**MUSIC 243 Indian Music Ensemble II**

★3 (fi 6) (two term, 0-4L-0). The classical music of India, through group instruction in singing, tabla (drums), sitar (plucked lute), sarangi (bowed lute), bansuri (flute), harmonium, and ensemble performance. A set of instruments will be available. The ability to read music is not required. Prerequisite: consent of Department.

**MUSIC 244 West African Music Ensemble II**

★3 (fi 6) (two term, 0-4L-0). Polyphonic and polyrhythmic music of West Africa, primarily through ensemble performance of the percussion and vocal music of the Ewe people of Ghana. A set of Ewe percussion instruments will be available. The ability to read music is not required. Prerequisite: consent of Department.

**MUSIC 245 Introduction to Music Technologies**

★3 (fi 6) (either term, 0-3L-0). Computer technology with a focus on MIDI, synthesis, and software programs for sequencing, music notation, audio recording and transformation, and music on the Internet. Prerequisites: ability to read music. Registration priority will be given to BMus (all routes), BMus/BEEd, BEEd Music Major/Minor, BA (Honors) Music Major and BA Music Major students.

**MUSIC 246 Opera Workshop**

★3 (fi 6) (two term, 0-4L-0). The coaching and staging of opera literature. Prerequisite: consent of Department, based on audition.

**MUSIC 247 Conducting Ensembles**

★3 (fi 6) (two term, 0-4L-0). Graduate Choral Conductors' Ensemble (Vocal), Graduate Choral Conductors' Ensemble (Instrumental), or Graduate Recital Choir. Prerequisite: Consent of Department, based on audition. Note: Does not fulfill large-ensemble requirements in BMus (all routes) and BMus/BEEd programs.

**MUSIC 248 Middle Eastern and North African Music Ensemble II**

★3 (fi 6) (two term, 0-4L-0). No formal musical training (e.g. the ability to read

music or instrumental competency) is required. Some traditional instruments will be available. Prerequisite: consent of the Department.

### **O** MUSIC 249 Jazz Ensembles

★3 (*fi 6*) (two term, 0-4L-0). Happnin' Jazz Choir, jazz Band I, or Jazz Band II. Prerequisite: consent of Department based on audition.

### **MUSIC 251 Aural and Keyboard Skills II**

★3 (*fi 6*) (two term, 0-3L-0). A continuation of MUSIC 151. Prerequisite: MUSIC 151. Corequisite: MUSIC 255 or 256 or consent of Department.

### **MUSIC 255 Music Theory III**

★3 (*fi 6*) (first term, 3-0-0). Elementary contrapuntal writing; analysis of Baroque and Classical Music. Prerequisites: MUSIC 150 or 155 and 156.

### **MUSIC 256 Music Theory IV**

★3 (*fi 6*) (either term, 3-0-0). Advanced analysis, study of works from the late Classical and Romantic repertoire. Prerequisite: MUSIC 255.

### **MUSIC 259 Introduction to Composition**

★3 (*fi 6*) (first term, 3-0-0). Prerequisites: MUSIC 150 or 156, and 151 or equivalent. Note: Public performance of works completed in the course will be expected. Registration priority given to BMus (all routes), BMus/BEEd, BA (Honors) Music Major, BEEd Music Major/Minor, and BA Music Major students.

### **MUSIC 260 Composition**

★3 (*fi 6*) (second term, 3-0-0). Prerequisite: MUSIC 259. Registration priority given to BMus, BA (Honors) Music Major, BEEd Music Major/Minor, and BA Music Major students.

### **MUSIC 263 Instrumentation and Arranging**

★3 (*fi 6*) (first term, 3-0-0). A study of the technical and expressive characteristics of the standard orchestral instruments. An introduction to historical developments in orchestration is included. Prerequisites: MUSIC 150 or 156 or equivalent. Formerly MUSIC 462.

### **MUSIC 280 Introduction to the Study of Western Music History**

★3 (*fi 6*) (second term, 3-0-0). A study of music history and style to 1600 from the perspective of social, cultural, and philosophical contexts, emphasizing the development of listening, score reading, research, critical thinking, and communication skills. Prerequisite: Music 155 or, for students not in a BMus program, consent of the department. Not available to students with credit in MUSIC 281.

### **MUSIC 283 Western Art Music, 1600-1850**

★3 (*fi 6*) (first term, 3-0-0). A study of music history and style from 1600 to 1850 from social, cultural, and philosophical perspectives with attention to listening, score reading, research, critical thinking, and communication skills. Prerequisite: MUSIC 280. Not available to students with credit in MUSIC 281.

### **MUSIC 284 Western Art Music, 1850-present**

★3 (*fi 6*) (second term, 3-0-0). A study of music history and style from 1850 to present from social, cultural, and philosophical perspectives with attention to listening, score reading, research, critical thinking, and communication skills. Prerequisite: MUSIC 280. Not available to students with credit in MUSIC 282.

### **MUSIC 292 Contemporary Music**

★3 (*fi 6*) (two term, 0-4L-0). Performance and coaching experience in a range of 20th century and contemporary repertoires. Prerequisite: consent of the Department based on audition.

### **MUSIC 293 Experimental Improvisation Ensemble**

★3 (*fi 6*) (two term, 0-2L-0). Improvised, experimental music explored through creative exercises, group instruction and performance. No formal training is required. Prerequisite: consent of the Department.

### **MUSIC 303 Piano Pedagogy I**

★3 (*fi 6*) (first term, 3-0-0). Prerequisites: MUSIC 221, 224, 225, or equivalent.

### **MUSIC 304 Piano Pedagogy II**

★3 (*fi 6*) (second term, 3-0-0). Prerequisite: MUSIC 303.

### **MUSIC 311 Latin America and the Cultures of Popular Music**

★3 (*fi 6*) (either term, 3-0-0). Popular music and its role in the formation of regional and national identities, with a focus on concepts such as high and low cultures, mass culture and mass media, cultural hybridity, diaspora, and creativity. Prerequisite: LA ST 205 or 210, or MUSIC 102 or 170, or consent of Department. Note: not to be taken by students with credit in LA ST 311.

### **MUSIC 314 Canadian Music**

★3 (*fi 6*) (either term, 3-0-0). The history of music in Canada from colonial times to the present. Prerequisite: MUSIC 101 or equivalent. Not available to students with credit in MUSIC 215.

### **MUSIC 315 Introduction to Conducting**

★3 (*fi 6*) (first term, 3-0-0). Development of basic conducting techniques and score reading. Prerequisites: MUSIC 150 or 156, and 151, or equivalent

### **MUSIC 321 Diction for Singers I**

★3 (*fi 6*) (either term, 0-3L-0). The application of the International Phonetic

Alphabet (IPA) to singing in English and German. Prerequisite: MUSIC 125 (Voice) or consent of Department. Not open to students with credit in MUSIC 320.

### **MUSIC 322 Diction for Singers II**

★3 (*fi 6*) (either term, 0-3L-0). The application of the International Phonetic Alphabet (IPA) to singing in French and Italian. Prerequisite: MUSIC 125 (Voice) or consent of Department. Not open to students with credit in MUSIC 320.

### **MUSIC 342 Specialized Ensemble I**

★3 (*fi 6*) (two term, 0-4L-0). Prerequisite: consent of Department, based on audition.

### **O** MUSIC 343 Indian Music Ensemble III

★3 (*fi 6*) (two term, 0-4L-0). The classical music of India, through group instruction in singing, tabla (drums), sitar (plucked lute), sarangi (bowed lute), bansuri (flute), harmonium, and ensemble performance. A set of instruments will be available. The ability to read music is not required. Prerequisite: consent of Department.

### **O** MUSIC 344 West African Music Ensemble III

★3 (*fi 6*) (two term, 0-4L-0). Polyphonic and polyrhythmic music of West Africa, primarily through ensemble performance of the percussion and vocal music of the Ewe people of Ghana. A set of Ewe percussion instruments will be available. The ability to read music is not required. Prerequisite: consent of Department.

### **O** MUSIC 347 Conducting Ensembles

★3 (*fi 6*) (two term, 0-4L-0). Graduate Choral Conductors' Ensemble (Vocal), Graduate Choral Conductors' Ensemble (Instrumental), or Graduate Recital Choir. Department: Consent of Department, based on audition. Note: Does not fulfill large-ensemble requirements in BMus (all routes) and BMus/BEEd programs.

### **O** MUSIC 348 Middle Eastern and North African Music Ensemble III

★3 (*fi 6*) (two term, 0-4L-0). No formal musical training (e.g. the ability to read music or instrumental competency) is required. Some traditional instruments will be available. Prerequisite: consent of the Department.

### **O** MUSIC 349 Jazz Ensembles

★3 (*fi 6*) (either term, 0-4L-0). Happnin' Jazz Choir, Jazz Band I, or Jazz Band II. Prerequisite: consent of Department based on audition.

### **O** MUSIC 365 Introduction to Ethnomusicology

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: MUSIC 101 or 102 or consent of Department for students not in the BMus (all routes) or BMus/BEEd program. Not available to students with credit in MUSIC 265. May require payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

### **MUSIC 392 Contemporary Music**

★3 (*fi 6*) (two term, 0-4L-0). Performance and coaching experience in a range of 20th century and contemporary repertoires. Prerequisite: consent of the Department based on audition.

### **MUSIC 393 Experimental Improvisation Ensemble**

★3 (*fi 6*) (two term, 0-2L-0). Improvised, experimental music explored through creative exercises, group instruction and performance. No formal training is required. Prerequisite: consent of the Department.

### **MUSIC 403 Piano Literature I**

★3 (*fi 6*) (first term, 3-0-0). Prerequisite: consent of Department.

### **MUSIC 404 Piano Literature II**

★3 (*fi 6*) (second term, 3-0-0). Prerequisite: consent of Department.

### **MUSIC 409 Vocal Literature I**

★3 (*fi 6*) (either term, 0-3s-0). An extensive study of art song and concert repertoire composed for solo voice. Course format is seminar- and performance-based. Prerequisite: MUSIC 225 (voice or any instrument) or equivalent.

### **MUSIC 410 Vocal Literature II**

★3 (*fi 6*) (either term, 0-3s-0). A continuation of the study of art song and concert repertoire composed for solo voice. Course format is seminar-and performance-based. Prerequisite: MUSIC 409.

### **MUSIC 413 Studies in the History of Jazz**

★3 (*fi 6*) (either term, 3-0-0).

### **MUSIC 416 Instrumental Conducting**

★3 (*fi 6*) (second term, 3-0-0). Prerequisite: MUSIC 315.

### **MUSIC 417 Choral Conducting and Pedagogy**

★3 (*fi 6*) (second term, 3-0-0). Prerequisite: MUSIC 315.

### **MUSIC 422 Second Practical Subject**

★3 (*fi 9*) (two term, 0.5-0-0). Restricted to BMus (all routes), BMus/BEEd and BEEd students majoring in secondary music education. Twenty-six half-hour lessons for two terms. Prerequisite: consent of Department.

### **MUSIC 424 Applied Music**

★3 (*fi 9*) (either term, 1-0-0). Open only to non-BMus students and students transferring into the BMus Composition and Theory route. Thirteen one-hour lessons for one term. Prerequisites: MUSIC 224 or equivalent and consent of Department.



**MUSIC 425 Applied Music**

★6 (*fi 15*) (two term, 2-0-0). Restricted to BMus (all routes) and BMus/BEEd students. Note: Students intending to enrol in MUSIC 526 are required to have successfully presented a public recital while enrolled in MUSIC 425. Prerequisite: MUSIC 225.

**MUSIC 426 Applied Music**

★3 (*fi 9*) (two term, 0.5-0-0). Open only to non-BMus students and students transferring into the BMus Composition and Theory route. Thirteen one-hour lessons for one term. Prerequisites: MUSIC 224 or equivalent and consent of Department.

**MUSIC 427 Applied Music**

★6 (*fi 15*) (two term, 1-0-0). For non-BMus students. Twenty-six one-hour lessons for two terms. Prerequisite: consent of Department, based on audition. Not to be taken by students with credit in MUSIC 420.

**MUSIC 431 Band Techniques**

★3 (*fi 6*) (either term, 0-4L-0). Musical and practical aspects of band conducting. Prerequisite: A conducting course or substantial conducting experience.

**MUSIC 432 Second Practical Subject**

★3 (*fi 9*) (either term, 1-0-0). Restricted to BMus (all routes), BMus/BEEd, and BEEd students majoring in secondary music education. Thirteen one-hour lessons for one term. Prerequisite: consent of Department.

**MUSIC 433 The Organ and Its Literature I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 434 The Organ and Its Literature II**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 435 Vocal Pedagogy I**

★3 (*fi 6*) (either term, 3-0-0). A comprehensive study of vocal techniques, and methods of vocal training in "classical singing," including the physicality of the instrument. Prerequisites: MUSIC 221 or 225, or 224, or equivalent.

**MUSIC 436 Vocal Pedagogy II**

★3 (*fi 6*) (either term, 3-0-0). A continuing study of vocal techniques, and methods of vocal training in "classical singing," including the physicality of the instrument. Prerequisite: MUSIC 435.

**MUSIC 438 Poetry and Performance of the German Lied**

★3 (*fi 6*) (Spring/Summer, 3-3L-0). Available only to students attending the summer master course of the Franz-Schubert-Institut in Baden bei Wien, Austria. Prerequisite: consent of Department and acceptance into the Franz-Schubert-Institut program. MUSIC 438 is graded on a CR/NC basis.

**MUSIC 439 Vocal and Instrumental Chamber Ensemble**

★3 (*fi 6*) (two term, 0-2L-0). Prerequisite: consent of Department, based on audition.

**MUSIC 440 Choral Ensemble**

★3 (*fi 6*) (two term, 0-4L-0). Concert Choir or Madrigal Singers. Prerequisite: consent of Department, based on audition.

**MUSIC 441 Instrumental Ensemble**

★3 (*fi 6*) (two term, 0-4L-0). Wind Ensemble, University Symphony Orchestra, Concert Band, or Guitar Ensemble. Prerequisite: consent of Department based on audition.

**MUSIC 442 Specialized Ensemble II**

★3 (*fi 6*) (two term, 0-4L-0). Prerequisite: consent of Department based upon audition.

**MUSIC 443 Indian Music Ensemble IV**

★3 (*fi 6*) (two term, 0-4L-0). The classical music of India, through group instruction in singing, tabla (drums), sitar (plucked lute), sarangi (bowed lute), bansuri (flute), harmonium, and ensemble performance. A set of instruments will be available. The ability to read music is not required. Prerequisite: consent of Department.

**MUSIC 444 West African Music Ensemble IV**

★3 (*fi 6*) (two term, 0-4L-0). Polyphonic and polyrhythmic music of West Africa, primarily through ensemble performance of the percussion and vocal music of the Ewe people of Ghana. A set of Ewe percussion instruments will be available. The ability to read music is not required. Prerequisite: consent of Department.

**MUSIC 445 Electroacoustic Music**

★3 (*fi 6*) (second term, 0-3L-0). Electroacoustic music techniques, history and repertoire. Prerequisite: consent of department. Registration priority will be given to BMus (all routes), BA (Honors) Music Major, BEEd Music Major/Minor, BA Music Major and graduate students in Music.

**MUSIC 446 Opera Workshop**

★3 (*fi 6*) (two term, 0-4L-0). The coaching and staging of opera literature. Prerequisite: consent of Department, based on audition.

**MUSIC 447 Conducting Ensembles**

★3 (*fi 6*) (two term, 0-4L-0). Graduate Choral Conductors' Ensemble (Vocal), Graduate Choral Conductors' Ensemble (Instrumental), or Graduate Recital Choir.

Prerequisite: Consent of Department, based on audition. Note: Does not fulfill large-ensemble requirements in BMus (all routes) and BMus/BEEd programs.

**MUSIC 448 Middle Eastern and North African Music Ensemble IV**

★3 (*fi 6*) (two term, 0-4L-0). No formal musical training (e.g. the ability to read music or instrumental competency) is required. Some traditional instruments will be available. Prerequisite: consent of the Department.

**MUSIC 449 Jazz Ensembles**

★3 (*fi 6*) (two term, 0-4L-0). Happnin' Jazz Choir, Jazz Band I, or Jazz Band II. Prerequisite: consent of Department based on audition.

**MUSIC 451 Aural and Keyboard Skills III**

★3 (*fi 6*) (either term, 0-3L-0). The development of advanced musicianship skills. Prerequisites: MUSIC 250 or 256, and 251, or equivalent.

**MUSIC 455 Music Theory V**

★3 (*fi 6*) (first term, 3-0-0). Theories of art music composed between 1900 and 1950. Prerequisite: MUSIC 256. Not to be taken by students with credit in MUSIC 256 prior to 2008.

**MUSIC 456 Music Theory VI**

★3 (*fi 6*) (second term, 3-0-0). Analysis of popular musics. Prerequisite: MUSIC 256.

**MUSIC 457 String Literature**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 458 Music Theory VII**

★3 (*fi 6*) (either term, 3-0-0). Theories of art music composed after 1950. Not to be taken by students with credit in MUSIC 455 prior to 2008. Prerequisite: MUSIC 455 taken in 2008 or later.

**MUSIC 459 String Pedagogy**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: MUSIC 221, 224, 225, 226, 227, or consent of Department.

**MUSIC 462 Topics in Orchestration**

★3 (*fi 6*) (either term, 3-0-0). Contemporary acoustic and/or electroacoustic orchestration techniques and practices. Prerequisite: MUSIC 463 or equivalent, or consent of Department.

**MUSIC 463 Orchestration**

★3 (*fi 6*) (second term, 3-0-0). A detailed study of orchestration and its historical developments. Prerequisite: MUSIC 263.

**MUSIC 464 Topics in Ethnomusicology: Music and Religion**

★3 (*fi 6*) (either term, 3-0-0). Explores music and sound as central aspects of religious concepts, meaning, and performance, with special emphasis on ritual. Prerequisite: consent of Department.

**MUSIC 465 Area Studies in Ethnomusicology**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 466 Topics in Ethnomusicology**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 467 Area Studies in Ethnomusicology: India and South Asia**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 468 Area Studies in Ethnomusicology: The Arab World**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 469 Area Studies in Ethnomusicology: Music and Islam**

★3 (*fi 6*) (either term, 3-0-0). Addresses the sonic practices of Islamic rituals, Muslim discourses about music, and the relation of both to the rich diversity of religious and musical practices in Muslim societies around the globe. Prerequisite: consent of Department.

**MUSIC 470 Composition**

★3 (*fi 6*) (first term, 3-0-0). Tutorial instruction in either acoustic or electronic free composition. Public performance of compositions is required. Prerequisite: MUSIC 260 (or equivalent) and consent of the Department based on portfolio review. Not to be taken by students with credit in MUSIC 460. Co- or Prerequisite: MUSIC 263. Registration priority given to BMus, BA (Honors) Music Major, BEEd Music Major/Minor, and BA Music Major students.

**MUSIC 471 Composition**

★3 (*fi 6*) (second term, 3-0-0). Tutorial instruction in either acoustic or electronic free composition. Public performance of compositions is required. Not to be taken by students with credit in MUSIC 460. Prerequisite: MUSIC 470 and consent of the Department based on portfolio review. Pre or corequisite: MUSIC 445. Registration priority given to BMus, BA (Honors) Music Major, BEEd.

**MUSIC 480 Survey of Contemporary Repertoire**

★3 (*fi 6*) (either term, 3-0-0). Overview of acoustic and/or electroacoustic repertoire from c. 1950. Co- or Prerequisite: MUSIC 256.

**MUSIC 481 Studies in Avant-Garde Music**

★3 (*fi 6*) (either term, 3-0-0). Co- or prerequisite: MUSIC 455.

**MUSIC 482 Studies in Music and Gender**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 483 Studies in Musical Genre**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 484 Studies in Music and Society**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 485 Composer Studies**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 487 Period Studies**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 492 Contemporary Music**

★3 (fi 6) (two term, 0-4L-0). Performance and coaching experience in a range of 20th century and contemporary repertoires. Prerequisite: consent of the Department based on audition.

**MUSIC 493 Experimental Improvisation Ensemble**

★3 (fi 6) (two term, 0-2L-0). Improvised, experimental music explored through creative exercises, group instruction and performance. No formal training is required. Prerequisite: consent of the Department.

**MUSIC 501 Music History Seminar I**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

**MUSIC 502 Music History Seminar II**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

**MUSIC 504 Honors Essay**

★3 (fi 6) (either term, 3-0-0). Restricted to BA Honors Music major students.

**MUSIC 505 Bibliography and Methods of Research**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department. Registration priority given to MA students in music, MMus, BMus (Music History), BMus (World Music), and BA (Honors) Music Major students. If space remains, restricted to BMus (all routes) students only.

**MUSIC 506 Tutorial Study**

★3 (fi 6) (either term, 3-0-0). Independent research in a specific area of the student's interest. Prerequisite: consent of Department.

**MUSIC 507 Writing About Music**

★3 (fi 6) (either term, 3-0-0). Through lectures, assigned readings, and short written assignments, students will investigate technical aspects relevant to writing about music. Uses of grammar, rhetoric, and the graphic design of musical illustrations will be addressed in order to develop facility, as well as a clear and personal style of paper writing. The course will be team taught to cover conventional modes of written expression in music history, theory, and ethnomusicology. Prerequisite: MUSIC 505.

**MUSIC 508 Seminar in Canadian Music**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

**MUSIC 522 Second Practical Subject**

★3 (fi 9) (two term, 0.5-0-0). Restricted to BMus (all routes), BMus/BE and BE students majoring in secondary music education. Twenty-six half-hour lessons for two terms. Prerequisite: consent of Department.

**MUSIC 524 Applied Music**

★3 (fi 9) (either term, 1-0-0). For non-BMus students. Thirteen one-hour lessons for one term. Prerequisites: MUSIC 424 or equivalent and consent of Department.

**MUSIC 525 Applied Music**

★6 (fi 15) (two term, 2-0-0). Restricted to BMus (all routes) students.

**MUSIC 526 Applied Music**

★3 (fi 9) (two term, 0.5-0-0). For non-BMus students. Twenty-six half-hour lessons for two terms. Prerequisite: consent of Department, based on audition. Not to be taken by students with credit in MUSIC 520.

**MUSIC 527 Applied Music**

★6 (fi 15) (two term, 1-0-0). For non-BMus students. Twenty-six one-hour lessons for two terms. Prerequisite: consent of Department, based on audition.

**MUSIC 532 Second Practical Subject**

★3 (fi 9) (either term, 1-0-0). Restricted to BMus (all routes), BMus/BE, and BE students majoring in secondary music education. Thirteen one-hour lessons for one term. Prerequisite: consent of Department.

**MUSIC 533 Hymnody and Service Playing I**

★3 (fi 6) (either term, 0-3L-0). Prerequisite: consent of Department. Not available to students with credit in MUSIC 406.

**MUSIC 534 Hymnody and Service Playing II**

★3 (fi 6) (either term, 0-3L-0). Prerequisite: MUSIC 533 or consent of Department. Not available to students with credit in MUSIC 406.

**MUSIC 539 Vocal and Instrumental Chamber Ensemble**

★3 (fi 6) (two term, 0-2L-0). Prerequisite: consent of Department, based on audition.

**O MUSIC 540 Choral Ensemble**

★3 (fi 6) (two term, 0-4L-0). Concert Choir or Madrigal Singers. Prerequisite: consent of Department, based on audition.

**O MUSIC 541 Instrumental Ensemble**

★3 (fi 6) (two term, 0-4L-0). Wind Ensemble, University Symphony Orchestra, Concert Band, or Guitar Ensemble. Prerequisite: consent of Department based on audition.

**MUSIC 542 Specialized Ensemble III**

★3 (fi 6) (two term, 0-4L-0). Prerequisite: consent of Department based on audition.

**MUSIC 545 Seminar in Computer Applications to Music**

★3 (fi 6) (either term, 0-3s-0). Computer applications used in various genres, including acoustic and algorithmic composition, music notation, analysis, live electronics, electroacoustic/acousmatic music, and sound ecology. Prerequisites: Music 445 or equivalent or consent of Department.

**O MUSIC 546 Opera Workshop**

★3 (fi 6) (two term, 0-4L-0). The coaching and staging of opera literature. Prerequisite: consent of Department, based on audition.

**MUSIC 555 Issues in Theory and Analysis**

★3 (fi 6) (either term, 3-0-0). Prerequisite: MUSIC 455 or 456.

**MUSIC 556 Seminar in Music Theory**

★3 (fi 6) (either term, 0-3s-0). Prerequisites: MUSIC 256 and consent of Department.

**MUSIC 570 Composition**

★3 (fi 6) (first term, 3-0-0). Tutorial instruction in either acoustic or electronic free composition. Public performance of compositions is required. Not to be taken by students with credit in MUSIC 560. Prerequisite: MUSIC 471 (or equivalent) and consent of the Department based on portfolio review. Normally, MUSIC 570 is available only to students in the Composition and Theory Route of the BMus program.

**MUSIC 571 Composition**

★3 (fi 6) (second term, 3-0-0). Tutorial instruction in either acoustic or electronic free composition. Public performance of works is required. Not to be taken by students with credit in MUSIC 560. Prerequisite: MUSIC 570 (or equivalent) and consent of the Department based on portfolio review. Normally, MUSIC 571 is available only to students in the Composition and Theory Route of the BMus program.

**MUSIC 592 Contemporary Music**

★3 (fi 6) (two term, 0-4L-0). Performance and coaching experience in a range of 20th century and contemporary repertoires. Prerequisite: consent of the Department based on audition.

**MUSIC 593 Experimental Improvisation Ensemble**

★3 (fi 6) (two term, 0-2L-0). Improvised, experimental music explored through creative exercises, group instruction and performance. No formal training is required. Prerequisite: consent of the Department.

**Graduate Courses**

**Note:** The following undergraduate courses may be taken for credit by graduate students: MUSIC 321, 322, 403, 404, 413, 433, 434, 435, 436, 445, 501, 502, 505, 507, 508, 525, 533, 534, 535, 542, 545, 555, 556, 570, 571.

**MUSIC 509 Advanced Vocal Literature I**

★3 (fi 6) (either term, 0-3s-0). An extensive study of art song and concert repertoire composed for solo voice. Course format is seminar- and performance-based.

**MUSIC 510 Advanced Vocal Literature II**

★3 (fi 6) (either term, 0-3s-0). A continuation of the study of art song and concert repertoire composed for solo voice. Course format is seminar- and performance-based. Prerequisite: MUSIC 409.

**MUSIC 513 Topics in the History of Jazz**

★3 (fi 6) (either term, 3-0-0).

**MUSIC 538 Poetry and Performance of the German Lied**

★3 (fi 6) (Spring/Summer, 3-3L-0). Available only to students attending the summer master course of the Franz-Schubert-Institut in Baden bei Wien, Austria. Prerequisite: consent of Department and acceptance into the Franz-Schubert-Institut program. Music 538 is graded on a CR/NC basis.

**O MUSIC 543 Indian Music Ensemble V**

★3 (fi 6) (two term, 0-4L-0). The classical music of India, through group instruction in singing, tabla (drums), sitar (plucked lute), sarangi (bowed lute), bansuri (flute), harmonium, and ensemble performance. A set of instruments will be available. The ability to read music is not required. Prerequisite: consent of Department.

**O MUSIC 544 West African Music Ensemble V**

★3 (fi 6) (two term, 0-4L-0). Polyphonic and polyrhythmic music of West Africa, primarily through ensemble performance of the percussion and vocal music of the Ewe people of Ghana. A set of Ewe percussion instruments will be available. The ability to read music is not required. Prerequisite: consent of Department.

**O MUSIC 547 Conducting Ensembles**

★3 (fi 6) (two term, 0-4L-0). Graduate Choral Conductors' Ensemble (Vocal), Graduate Choral Conductors' Ensemble (Instrumental), or Graduate Recital Choir. Prerequisite: Consent of Department, based on audition.

**O MUSIC 548 Middle Eastern and North African Music Ensemble V**

★3 (fi 6) (two term, 0-4L-0). No formal musical training (e.g. the ability to read music or instrumental competency) is required. Some traditional instruments will be available. Prerequisite: consent of the Department.

**O MUSIC 549 Jazz Ensembles**

★3 (fi 6) (two term, 0-4L-0). Happinin' Jazz Choir, Jazz Band I, or Jazz Band II. Prerequisite: consent of Department based on audition.

**MUSIC 557 Advanced Studies in String Literature**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 558 Advanced Theories of Music After 1950**

★3 (fi 6) (either term, 3-0-0). Prerequisite: Consent of Department.

**MUSIC 559 Advanced Studies in String Pedagogy**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 562 Advanced Topics in Orchestration**

★3 (fi 6) (either term, 3-0-0). Contemporary acoustic and/or electroacoustic orchestration techniques and practices. Prerequisite: MUSIC 463 or equivalent, or consent of Department.

**O MUSIC 564 Advanced Topics in Ethnomusicology: Music and Religion**

★3 (fi 6) (either term, 3-0-0). Explores music and sound as central aspects of religious concepts, meaning, and performance, with special emphasis on ritual. Prerequisite: consent of Department.

**O MUSIC 565 Area Studies in Ethnomusicology**

★3 (fi 6) (either term, 3-0-0). Prerequisite: MUSIC 365 or consent of Department.

**O MUSIC 566 Topics in Ethnomusicology**

★3 (fi 6) (either term, 3-0-0). Prerequisite: MUSIC 365 or consent of Department.

**O MUSIC 567 Advanced Area Studies in Ethnomusicology: India and South Asia**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**O MUSIC 568 Advanced Area Studies in Ethnomusicology: The Arab World**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**O MUSIC 569 Advanced Area Studies in Ethnomusicology: Music and Islam**

★3 (fi 6) (either term, 3-0-0). Addresses the sonic practices of Islamic rituals, Muslim discourses about music, and the relation of both to the rich diversity of religious and musical practices in Muslim societies around the globe. Prerequisite: consent of Department.

**MUSIC 580 Advanced Contemporary Repertoire**

★3 (fi 6) (either term, 3-0-0). Overview of acoustic and/or electroacoustic repertoire from c. 1950. Co- or Prerequisite: MUSIC 256.

**MUSIC 581 Advanced Studies in Avant-Garde**

★3 (fi 6) (either term, 3-0-0). Prerequisite: MUSIC 256.

**MUSIC 582 Advanced Studies in Music and Gender**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 583 Advanced Studies in Musical Genre**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 584 Advanced Studies in Music and Society**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 585 Advanced Composer Studies**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 587 Advanced Period Studies**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 601 Tutorial Study**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 602 Tutorial Study**

★3 (fi 6) (two term, 1.5-0-0). Prerequisite: consent of Department.

**MUSIC 603 Practicum in Piano Teaching**

★3 (fi 6) (either term, 2-0-3). Prerequisite: MUSIC 304 or consent of Department.

**MUSIC 604 Piano Pedagogy**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: MUSIC 304 or consent of Department.

**MUSIC 608 Seminar in 20th-Century Music**

★3 (fi 6) (either term, 0-3s-0).

**MUSIC 613 Seminar in Romantic Music**

★3 (fi 6) (either term, 0-3s-0).

**MUSIC 614 Proseminar in Musicology**

★3 (fi 6) (either term, 0-3s-0). An overview of history, methodologies, and current issues in musicology. Prerequisite: MUSIC 505.

**MUSIC 615 Seminar in Musicology I**

★3 (fi 6) (either term, 0-3s-0).

**MUSIC 616 Seminar in Musicology II**

★3 (fi 6) (either term, 0-3s-0).

**MUSIC 621 Applied Music**

★6 (fi 15) (two term, 2-0-0).

**MUSIC 623 Supplementary Applied Music**

★3 (fi 9) (two term, 0.5-0-0). Twenty-six half-hour lessons for two terms. Prerequisite: consent of Department.

**MUSIC 624 Supplementary Applied Music**

★3 (fi 9) (either term, 1-0-0). Thirteen one-hour lessons for one term. Prerequisite: consent of Department.

**MUSIC 625 Applied Music**

★3 (fi 9) (variable, 2-0-0). Thirteen hours of lessons over either the fall term or over two terms, plus attendance at weekly repertoire class.

**MUSIC 630 Choral Conducting**

★6 (fi 12) (two term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 631 Advanced Band Techniques**

★3 (fi 6) (either term, 3-0-0). Advanced musical and practical aspects of band conducting. Prerequisite: MUSIC 431 or equivalent, or substantial conducting experience, and consent of the Department.

**MUSIC 632 Advanced Wind Band Conducting**

★6 (fi 12) (two term, 2-0-0). Prerequisite: MUSIC 431 or equivalent, or substantial conducting experience, and consent of the Department.

**MUSIC 633 Seminar in Choral Literature I**

★3 (fi 6) (either term, 0-3s-0).

**MUSIC 634 Seminar in Choral Literature II**

★3 (fi 6) (either term, 0-3s-0).

**MUSIC 635 Choral Conducting**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 636 Choral Conducting**

★3 (fi 6) (either term, 3-0-0). Prerequisite: Music 635 and consent of Department.

**MUSIC 638 Choral Conducting**

★3 (fi 6) (two term, 3-0-0). Prerequisite: MUSIC 630.

**MUSIC 639 Vocal and Instrumental Chamber Ensemble**

★3 (fi 6) (two term, 0-2L-0). Prerequisite: consent of Department, based upon audition.

**O MUSIC 640 Choral Ensemble**

★3 (fi 6) (two term, 0-4L-0). Concert Choir or Madrigal Singers. Prerequisite: consent of Department, based upon audition.

**O MUSIC 641 Instrumental Ensemble**

★3 (fi 6) (two term, 0-4L-0). Wind Ensemble, University Symphony Orchestra, Concert Band, or Guitar Ensemble. Prerequisite: consent of Department based upon audition.

**MUSIC 645 Seminar in Computer Music Composition**

★3 (fi 6) (either term, 0-3s-0). Application and programming of computer music software. Prerequisites: MUSIC 445 or equivalent, or consent of Department.

**O MUSIC 646 Opera Workshop**

★3 (fi 6) (two term, 0-4L-0). The coaching and staging of opera literature. Prerequisite: consent of Department, based on audition.

**MUSIC 650 Proseminar in Music Theory**

★3 (fi 6) (either term, 0-3s-0).

**MUSIC 651 Seminar in Music Analysis**

★3 (fi 6) (either term, 0-3s-0).



**MUSIC 653 Seminar in History of Theory**

★3 (fi 6) (either term, 0-3s-0).

**MUSIC 654 Seminar in Theory and Music**

★3 (fi 6) (either term, 0-3s-0).

**MUSIC 660 Advanced Composition I**

★6 (fi 12) (two term, 3-0-0).

**MUSIC 661 Advanced Composition II**

★3 (fi 6) (either term, 3-0-0). Prerequisite: MUSIC 660.

**MUSIC 665 Issues in Ethnomusicology**

★3 (fi 6) (either term, 0-3s-0).

**MUSIC 666 Field Methods in Ethnomusicology**

★3 (fi 6) (either term, 0-3s-0).

**MUSIC 685 Graduate Keyboard Seminar**

★3 (fi 6) (two term, 0-1.5s-0). Topics in performance-practice issues. Restricted to pianists and organists in the MMus and DMus programs.

**MUSIC 692 Contemporary Music**

★3 (fi 6) (two term, 0-4L-0). Performance and coaching experience in a range of 20th century and contemporary repertoires. Prerequisite: consent of the Department based on audition.

**MUSIC 693 Experimental Improvisation Ensemble**

★3 (fi 6) (two term, 0-2L-0). Improvised, experimental music explored through creative exercises, group instruction and performance. No formal training is required. Prerequisite: consent of the Department.

**MUSIC 699 Directed Research**

★3 (fi 6) (either term, 3-0-0).

**MUSIC 721 Applied Music**

★6 (fi 15) (two term, 2-0-0).

**MUSIC 725 Applied Music**

★6 (fi 15) (two term, 2-0-0). Twenty-six hours of lessons over two terms, plus one hour of repertoire class per week.

**MUSIC 730 Coral Conducting**

★6 (fi 12) (two term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 735 Choral Conducting**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 736 Choral Conducting**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**MUSIC 738 Choral Conducting**

★3 (fi 6) (two term, 3-0-0). Prerequisite: MUSIC 730.

**MUSIC 739 Special Projects in Chamber Music**

★3 (fi 6) (two term, 0-2L-0). Restricted to Doctor of Music students.

**MUSIC 740 Choral Ensemble**

★3 (fi 6) (two term, 0-4L-0). Concert Choir or Madrigal Singers. Prerequisite: consent of Department based upon audition. Restricted to Doctor of Music students.

**MUSIC 741 Instrumental Ensemble**

★3 (fi 6) (two term, 0-4L-0). Wind Ensemble, University Symphony Orchestra, Concert Band, or Guitar Ensemble. Prerequisite: consent of Department based upon audition. Restricted to Doctor of Music students.

**MUSIC 746 Opera Workshop**

★3 (fi 6) (two term, 0-4L-0). The coaching and staging of opera literature. Prerequisite: consent of Department based upon audition. Restricted to Doctor of Music students.

**MUSIC 760 Advanced Composition III**

★6 (fi 12) (two term, 3-0-0). Restricted to DMus Composition students.

**MUSIC 761 Advanced Composition IV**

★3 (fi 6) (either term, 3-0-0). Prerequisite: MUSIC 760. Restricted to DMus Composition students.

**MUSIC 903 Directed Research Project**

★3 (fi 6) (either term, unassigned). This is a pass/fail course.

**MUSIC 906 Directed Research Project**

★6 (fi 12) (either term, unassigned). This is a pass/fail course.

**MUSIC 909 Directed Research Project**

★9 (fi 18) (either term, unassigned). This is a pass/fail course.

**MUSIC 100 Les rudiments de la musique**

★3 (fi 6) (premier semestre, 3-0-0). L'étude de la notation musicale et des rudiments de la musique. Introduction à la lecture élémentaire. Note: Les étudiants en BMus ne peuvent pas suivre ce cours. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MUSIC 100.

**MUSIC 101 Introduction à la musique occidentale I**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Une étude de la littérature musicale en insistant sur l'audition et les moyens analytiques. Un bref survol historique de la musique occidentale. Note : Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MUSIC 101.

**MUSIC 103 Fondements de la musique**

★3 (fi 6) (l'un ou l'autre semestre, 0-3L-0). L'acquisition et le développement de connaissances et d'habiletés musicales fondamentales nécessaires à l'enseignement élémentaire. Préalable(s): MUSIC 100 ou l'équivalent mesurable par un test sur les rudiments de la musique.

**MUSIC 124 Musique appliquée**

★3 (fi 6) (l'un ou l'autre semestre, 1-0-0). Leçons de chant individuelles pour les étudiants non inscrits au BMus. Préalable(s): l'approbation du professeur après audition. Note : Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MUSIC 124.

**MUSIC 140 Ensemble choral**

★3 (fi 6) (aux deux semestres, 0-4L-0). Cours de chant choral. Préalable(s): l'approbation du professeur après audition. Note : Un demi-cours qui s'étale sur les deux semestres. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MUSIC 140.

**MUSIC 151 Culture de l'oreille et facilité au clavier I**

★3 (fi 6) (aux deux semestres, 0-3L-0). Perception auditive de matières couvertes en MUSIC 155 et 156, par la mise en pratique de la lecture à vue, de la dictée et de l'harmonie au clavier. Préalable(s): MUSIC 100 ou l'équivalent mesurable par un test de placement en théorie musicale de la Faculté et un examen sur les habilités auditives sauf pour les étudiants du BMus. Note: un demi-cours qui s'étale sur les deux semestres. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MUSIC 151.

**MUSIC 155 Théorie musicale I**

★3 (fi 6) (premier semestre, 3-0-0). Une étude de l'harmonie classique (c.-à-d. des XVIIe et XVIIIe siècles) qui inclut l'analyse élémentaire et une discussion préliminaire des éléments relatifs à l'écriture du contrepoint et à la texture chorale. Préalable(s): MUSIC 100 ou l'équivalent mesurable par un test de placement en théorie musicale de la Faculté. Note : Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MUSIC 155.

**MUSIC 156 Théorie musicale II**

★3 (fi 6) (deuxième semestre, 3-0-0). La continuation de l'étude de l'harmonie classique et de l'analyse formelle élémentaire. Préalable(s): MUSIC 155. Note : Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MUSIC 156.

**MUSIC 201 Introduction à la musique occidentale II**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Une continuation du survol historique de la musique occidentale entamé en MUSIC 101. Préalable : MUSIC 101 ou l'équivalent. Note : Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MUSIC 201.

**MUSIC 215 La musique au Canada**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). L'histoire de la musique au Canada de la colonisation jusqu'à nos jours. Prerequisite: MUSIC 101 ou l'équivalent. Anciennement MUSIC 315.

**MUSIC 224 Musique appliquée**

★3 (fi 6) (l'un ou l'autre semestre, 1-0-0). Leçons de chant individuelles pour les étudiants non inscrits au BMus. Préalable(s): MUSIC 124 ou l'équivalent et l'approbation du professeur. Note : Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MUSIC 224.

**MUSIC 240 Ensemble choral**

★3 (fi 6) (aux deux semestres, 0-4L-0). Cours de chant choral. Préalable(s): l'approbation du professeur après audition. Note : Un demi-cours qui s'étale sur les deux semestres. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MUSIC 240.

**MUSIC 315 Introduction à l'art de diriger**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Préalable(s): MUSIC 151 et 156, ou l'équivalent.

**MUSIC 350 Production vocale**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Exploration de la voix parlée et de la voix chantée. Éléments théoriques (physiologie et acoustique vocale) et pratiques (exercices d'élocution, exposé oral, lecture à voix haute, chant) de la production vocale. Le projet final prendra la forme d'une présentation orale pouvant inclure chant, poésie, lecture, exposé ou improvisation et mettra l'accent sur la production vocale. Ce cours n'est pas accessible aux étudiants ayant suivi ADRAM 350.

**231.197 Musique, MUSIQ**

Faculté Saint-Jean

**Cours de 1er cycle**

The most current Course Listing is available on Bear Tracks.

<https://www.beartracks.ualberta.ca>

Préalables : ★3 en MUSIQ X24, MUSIQ X40 ou ADRAM, ou l'équivalent avec approbation du professeur.

**O MUSIQ 424 Musique appliquée**

★3 (fi 6) (l'un ou l'autre semestre, 1-0-0). Leçons de chant individuelles pour les étudiants non inscrits au BMus. Préalable(s) : MUSIQ 224 ou l'équivalent et l'approbation du professeur. Note : Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MUSIC 424.

**O MUSIQ 440 Ensemble choral**

★3 (fi 6) (aux deux semestres, 0-4L-0). Cours de chant choral. Préalable(s) : l'approbation du professeur après audition. Note : Un demi-cours qui s'étale sur les deux semestres. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MUSIC 440.

## Cours de 2e cycle

**O MUSIQ 524 Musique Appliquée (Chant)**

★3 (fi 6) (l'un ou l'autre semestre, 1-0-0). Leçons de chant individuelles pour les étudiants non inscrits au BMus. Préalable(s) : MUSIQ 424 ou l'équivalent et l'approbation du professeur. Note : Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MUSIC 524.

# 231.198 Native Studies, NS

Faculty of Native Studies

## Undergraduate Courses

**NS 103 Canadian Indigenous Language Immersion for Adult Beginners**

★3 (fi 6) (Spring/Summer, 3-0-0). An introduction to a Canadian indigenous language in an immersion context. No prior knowledge of the focus language is assumed. Note: This course cannot be used as a substitute for NS 152 nor does it prepare the student for NS 105. A student completing this course may still earn credit in NS 152 at a later date. Not for credit in Faculty of Native Studies degree programs.

**NS 104 The Structure of a Canadian Indigenous Language through Immersion**

★3 (fi 6) (Spring/Summer, 3-0-0). This course, delivered in an immersion context, is designed for beginning speakers or semi-speakers with only a basic knowledge of the particular Canadian indigenous language being focused in a given section. Topics include word, sentence, and narrative structure as represented in both oral and written forms of the language. Note: This course cannot be used as a substitute for NS 152 nor does it necessarily prepare the student for NS 105. A student completing this course may still earn credit in NS 152 or 153 at a later date. Not for credit in Faculty of Native Studies degree programs.

**O NS 105 Cree Language Challenge**

★3 (fi 6) (either term, unassigned). This is an exam only course open to fluent speakers of the Cree language. Credit: Pass/Fail.

**O NS 110 Historical Perspectives in Native Studies**

★3 (fi 6) (either term, 3-0-0). A thematic introduction to the historical relationships, colonial contexts, and social, economic, political and cultural patterns that have shaped the contemporary situation of Aboriginal peoples in Canada. Not open to students with credit in NS 210.

**O NS 111 Contemporary Perspectives in Native Studies**

★3 (fi 6) (either term, 3-0-0). An introductory survey of current issues affecting Aboriginal peoples in Canada and their efforts to confront their colonial relationships with and within Canadian society. Not open to students with credit in NS 211.

**O NS 152 Introductory Cree**

★6 (fi 12) (two term, 4-0-1). A general introduction to Plains Cree (Y dialect) grammar and vocabulary, with practice in speaking and work in the language laboratory. No prior knowledge of Cree is assumed. Not open to students with matriculation standing in Cree. Note: Students cannot receive credit for NS 152 and NS 153.

**O NS 153 Introduction to the Structure of the Cree Language for Cree Speakers**

★3 (fi 6) (second term, 4-0-0). A course designed specifically for fluent speakers of Cree who require an introduction to the Pentland orthography writing system and formal training and practice with Cree grammatical structure. The focus is on literacy in the Plains Cree dialect. Note: Students cannot receive credit for NS 152 and NS 153. Prerequisite: NS 105.

**NS 190 Academic Writing and Research in the Context of Native Studies**

★3 (fi 6) (either term, 3-0-0). An introduction to research and writing skills necessary in an academic environment, with an emphasis on how these methods are used in the discipline of Native Studies. Enrollment by Faculty consent only.

**O NS 200 Aboriginal Canada: Looking Forward/Looking Back**

★3 (fi 6) (either term, 2-1s-0). For students from faculties outside the Faculty of Native Studies with an interest in acquiring a basic familiarity with Aboriginal/

non-Aboriginal relationships. Consists of a survey of historical and contemporary relationships between Aboriginal people and newcomers, with the aim of expanding the understandings held by many Canadians about these relationships. Not available to Native Studies students.

**O NS 240 Introduction to Aboriginal Legal Issues**

★3 (fi 6) (either term, 3-0-0). This course is designed to give students an introduction to the development of Aboriginal rights law in Canada. It examines the colonial context of Canadian constitutional law, identifies sources of Aboriginal law, discusses the Treaty and Aboriginal rights and the nature of the fiduciary obligations of the Crown to Aboriginal people.

**O NS 252 Intermediate Cree**

★6 (fi 12) (two term, 3-0-1). Introduction to more complex grammatical structures; translation to and from Cree; reading of selected texts; oral practice, including conversation and work on individual projects. Prerequisite: NS 152 or 153.

**O NS 260 Contemporary Native Art**

★3 (fi 6) (either term, 3-0-0). An introduction to the study of contemporary North American Native artists with emphasis on the philosophical and cultural statements made through their artistic expression. Special attention will be placed on living Canadian Native artists.

**O NS 280 Selected Topics in Native Studies**

★3 (fi 6) (either term, 3-0-0).

**NS 290 Introduction to Research and Inquiry**

★3 (fi 6) (either term, 3-0-0). Basic research skills and concepts required in Native Studies will be developed by exploring secondary sources.

**O NS 300 Traditional Cultural Foundations I**

★3 (fi 6) (either term, 3-0-0). Introduces students to the diversity of North American Native peoples. Native traditions are treated as aspects of dynamic cultural systems that have enabled Native peoples to survive and thrive in the centuries prior to European arrival, to resist assimilation efforts, and to persist as culturally distinct peoples. Prerequisites: NS 110, 111 and 240 or 290 or consent of the Faculty.

**NS 314 History of Indians of Western Canada**

★3 (fi 6) (either term, 3-0-0). A survey of the evolution of Indian/European and Canadian relations in western Canada. Emphasis is on Indian historical perspectives and analyzing events and issues relevant to the various Indian groups of western Canada, including treaties and the history and development of reserves. Prerequisites: NS 110, 111 and 240 or 290 or consent of the Faculty.

**O NS 320 Aboriginal Governments and Politics**

★3 (fi 6) (either term, 3-0-0). The description, analysis, and principles of various Aboriginal governments will be examined. The relative merits of constitutional, legislative, and administrative options for realizing aboriginal self-government will be compared. A study of the international and Canadian examples of local and regional Aboriginal governments in practice will be an important focus of this course. Prerequisites: NS 110, 111 and 240 or 290 or consent of the Faculty.

**NS 330 Native Economic Development**

★3 (fi 6) (either term, 3-0-0). This course will review underlying factors which affect the economies of Native communities and examine different approaches to Native Economic development, including community, corporate and entrepreneurial business approaches. The Native perspective to Native Economic Development will be a principal theme. The objective of the course will be to assess approaches to the identification, planning, and implementation of economic development strategies for Native communities. Prerequisites: NS 110, 111 and 240 or 290 or consent of the Faculty.

**O NS 335 Native People and the Fur Trade**

★3 (fi 6) (either term, 3-0-0). Perspectives on the economic, cultural, and geographical aspects of the Native fur trade will be explored and examined critically. The influence of the changing relationships between Aboriginal peoples and mercantile trading interests will be assessed through lectures and seminars. Prerequisites: NS 110, 111, or consent of the Faculty.

**O NS 340 Aboriginal Legal Issues**

★3 (fi 6) (either term, 3-0-0). An overview of the legal traditions of indigenous peoples in Canada and around the world (often called customary law). Students will explore indigenous legal issues from various legal perspectives and examine the relationship between indigenous law and colonial law in Canada, as well as legal histories, various legal theories, and selected common law cases. Prerequisites: NS 110, 111 and 240 or consent of the Faculty.

**NS 345 Management Issues in Native Communities**

★3 (fi 6) (either term, 3-0-0). The course introduces the major management issues commonly faced by contemporary Native community, public administration, and business organizations as a result of their unique cultural, social, economic, demographic, and political environment. Students will acquire an orientation to the management process and to modern management theory and practices. In addition, opportunities will be made to develop and practice the managerial skills involved in diagnosis, analysis and resolution of management issues frequently

encountered in Native organizations. Prerequisites: NS 110, 111 and 240 or 290 or consent of the Faculty.

### NS 352 Advanced Cree

★6 (fi 12) (two term, 3-0-1). An intensive course designed to enable students to acquire considerable facility both in oral communication and in writing, employing both Roman and syllabic orthography. Prerequisite: NS 252.

### NS 355 Native Oral Traditions and Indigenous Knowledge

★3 (fi 6) (either term, 3-0-0). This course considers oral traditions as aspects of broader, culturally-defined systems of knowledge, in which stories are vehicles for encoding and transmitting knowledge about the people, their culture, and their history. It focuses on new academic and community-based approaches, as well as the complementarity of oral traditions/indigenous knowledge and Western science. Students will explore the evolving roles of oral traditions for contemporary Native peoples. Prerequisites: NS 110, 111 and 240 or 290 or consent of the Faculty.

### NS 361 Challenging Racism and Stereotypes

★3 (fi 6) (either term, 3-0-0). This course refutes the concept of "race" as a biological reality and traces the European origins, development, and persistence of racism, stereotypes, and discrimination directed at Aboriginal peoples of North America. Prerequisites: NS 110, NS 111 and NS 240 or NS 290 or consent of the Faculty.

### NS 362 Aboriginal Women

★3 (fi 6) (either term, 3-0-0). An interdisciplinary approach to understanding historical and contemporary experiences of Aboriginal women. Examines the ways in which Aboriginal women have resisted and been shaped by colonialism and other contemporary racialized gendered practices through an exploration of community, race, gender, sexuality, identity, representation, and activism. The course also considers the ways in which indigenous knowledges shape alternative ways of conceptualizing and politicizing history, identity, place, self-determination, land rights, resources and wellbeing. Prerequisite: NS 110 and NS 111.

### NS 370 The Métis: The Emergence of a People

★3 (fi 6) (either term, 3-0-0). An examination of the factors responsible for the emergence of Métis communities in different areas at different times, with the emphasis on Canada. The development of Métis people together with lifestyles that serve to distinguish them from others will receive much attention. Where applicable, comparisons with similar experiences elsewhere in the world will be made. Prerequisites: NS 110, 111 and 240 or 290 or consent of the Faculty.

### NS 372 Métis Politics

★3 (fi 6) (either term, 0-3s-0). An examination of various Métis political debates: identity, recognition, nationalism, political organizing, self-governance structures, constitutionalization of rights, and theories of Indigenous politics. Prerequisite: NS 110, 111 and 240 or 290 or consent of the Faculty.

### NS 376 Native Demography and Disease

★3 (fi 6) (either term, 3-0-0). This course focuses on the historic epidemic diseases that devastated Native communities following the arrival of Europeans in this hemisphere. Students will study evidence for health and disease and for the size of the Native population before contact, the epidemiology and impacts of infectious diseases that accompanied Europeans to the Americas, and the transition to a different disease profile in the 20th century. Native and European approaches to well-being and disease will be considered. Prerequisites: NS 110, 111 and 240 or 290 or consent of the Faculty.

### NS 380 Selected Topics in Native Studies

★3 (fi 6) (either term, 3-0-0). Prerequisites: NS 110, 111 and 240 or 290 or consent of the Faculty.

### NS 390 Research Methods in Native Studies

★3 (fi 6) (either term, 3-0-0). A survey of different disciplinary methods for conducting Native Studies research and data analysis, this course will also review and critique strategies and techniques applied by social science researchers with indigenous people. Prerequisites: NS 110, 111 and 290 or consent of Faculty.

### NS 400 Traditional Cultural Foundations II

★3 (fi 6) (either term, 3-0-0). Uses case studies to examine the dynamic qualities of North American Native cultures and societies. Some have maintained their unique identities over time, while experiencing often-considerable culture change as they have coped with new circumstances, both positive and negative. Others have emerged as new socio-cultural entities. These dynamics operate at multiple levels, from that of the individual to those of larger cultural and social entities. Students will consider ways in which Native peoples are drawing upon earlier cultural forms in creative ways to meet modern needs. Prerequisite: NS 300 or consent of the Faculty.

### NS 403 Selected Topics in Native Studies

★3 (fi 6) (either term, 3-0-0). Prerequisite: One 300-level course or consent of the Faculty. Sections may require payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

### NS 404 Selected Topics in Native Studies

★3 (fi 6) (either term, 3-0-0). Prerequisite: One 300-level course or consent of the Faculty.

### NS 405 Selected Topics in International Indigenous Studies

★3 (fi 6) (either term, 3-0-0). Prerequisite: One 300-level course or consent of the Faculty.

### NS 420 Negotiation Strategies

★3 (fi 6) (either term, 3-0-0). An exploration of the theory and practice of negotiation and mediation from different perspectives, including perspectives from the dominant society and indigenous peoples. The strategies of litigation, and coercion to overcome conflict and achieve settlements of disputes will also be examined. These negotiation theories will then be applied to concrete dispute situations in Canada, including multi-party disputes over land, governance, development of resources and the environment. This course will be taught in a seminar format. Prerequisite: NS 320 or 340 or consent of the Faculty.

### NS 430 Aboriginal Governance and Partnership Capstone

★3 (fi 6) (either term, 3-0-0). This course synthesizes and integrates the range of knowledge and analysis from previous Aboriginal governance courses, and normally includes a practical component to enhance the interplay of the theory and actual practice of governance. Prerequisites: ★6 from the list of required and elective courses for the Certificate in Aboriginal Governance and Partnership [see §124], or consent of the Faculty. NS 390 is also recommended. Students intending to complete the Certificate in Aboriginal Governance and Partnership should complete all other Certificate requirements first.

### NS 435 Management of Aboriginal Natural Resources

★3 (fi 6) (either term, 3-0-0). The application of knowledge of resource management to the traditional Native economic activities, especially hunting, fishing and trapping. Conservation problems which developed with the spread of the commercial economy will be analyzed by examining Aboriginal and European approaches to resource management. The use of conservation to rationalize the re-allocation of traditional resources are examined. Prerequisite: Any ★6 in EAS 294, 391, ENCS 201, 260 or AUGEO 324, or one 300-level NS course or consent of the Faculty.

### NS 440 Indigenous Treaties and Agreements

★3 (fi 6) (either term, 0-3s-0). An exploration of the historical and contemporary issues associated with treaties. Pre- and post-1867 Indian treaties and modern agreements in Canada will be examined. Prerequisite: One 300-level NS course or consent of the Faculty.

### NS 441 Indigenous Land Claims and Agreements

★3 (fi 6) (either term, 0-3s-0). An exploration of the historical and contemporary issues associated with indigenous land claims agreements. The background negotiations, and implementation of modern agreements in Canada will be the focus of this course. Recommend that NS 440 be taken. Prerequisite: One 300-level NS course or consent of the Faculty.

### NS 442 Colonialism and the Criminal Justice System

★3 (fi 6) (either term, 0-3s-0). Focuses on pertinent aspects of the Canadian criminal justice process as it relates to the experiences of Aboriginal people. In particular, issues pertaining to historical and emerging trends such as restorative justice and 'native prisons' are explored and critically analyzed, both in terms of how the justice process functioned historically, as well as its links to contemporary social relations such as the state, the media and the military, but also the powerful role played by racism and discrimination in shaping Aboriginal experiences with the criminal justice process. Prerequisites: NS 110, 111 and one 300-level NS course or consent of the Faculty.

### NS 445 Community Development Processes

★3 (fi 6) (either term, 3-0-0). In a seminar, students will identify, analyze and integrate community development philosophy, principles and practice. The relevance of traditional community development models to Native communities will be critically examined in light of the recent experiences of Native communities themselves. Prerequisites: NS 330, 345, 390 or consent of the Faculty.

### NS 450 Practicum in Native Studies

★3 (fi 6) (either term, unassigned). A supervised work-based experience that will permit students to apply Native Studies knowledge in a professional context thereby gaining an appreciation of the work environment. Prerequisites: Successful completion of ★90, including a minimum of ★9 in Native Studies courses; a minimum GPA of 2.0 on the last ★30; consent of the Faculty.

### NS 476 Perspectives on Aboriginal Health and Well-Being

★3 (fi 6) (either term, 3-0-0). A critical overview of the literature and contemporary health issues affecting Aboriginal peoples in Canada. Special focus is on the meanings of health, socio-economic and environmental determinants of health and the socio-political landscape of Aboriginal health research and healthcare policy. Prerequisites: NS 376 or consent of the Faculty.

### NS 485 Urban Aboriginal Issues and Identities

★3 (fi 6) (either term, 0-3s-0). Critically examines some of the core issues facing Aboriginal people living in Canada's cities, with a particular emphasis on how these issues affect the ways that urban Aboriginal communities are governed



municipally, provincially and federally, as well as how they form their own self-government institutions in urban areas. Prerequisites: NS 110, 111 and one 300-level NS course, or consent of the Faculty.

#### NS 490 Community-Based Research

★3 (fi 6) (either term, 0-3s-0). A seminar exploring the issues in the area of community-based research. The course will be organized primarily around the examination of case studies. Methodological concerns will focus on the political, cultural, ethical, and practical aspects of conducting community-based research in conjunction with Native groups and communities. Prerequisite: NS 390.

#### NS 498 Honors Paper or Project

★6 (fi 12) (two term, 0-3s-0). For students in the Honors program in Native Studies in their final year.

#### NS 499 Research Project

★3 (fi 6) (either term, 0-0-3). The research project is designed to provide students with a variety of options for carrying out their own research. The specific route taken will depend upon the resources of the School, opportunities available in the community, and the skills of the student. While the program is intended to be flexible, the main route around which students may design their projects will be research conducted in conjunction with a local native organization. Prerequisite: consent of the Faculty of Native Studies. Normally consent will not be given without credit in NS 390.

## Graduate Courses

#### NS 503 Directed Readings in Native Studies

★3 (fi 6) (either term, 0-3s-0). Sections may require payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### NS 504 Directed Advanced Readings in Native Studies

★3 (fi 6) (either term, 0-3s-0). Prerequisite: NS 503 or consent of the Faculty.

#### NS 599 Selected Research Topics in Native Studies

★3 (fi 6) (either term, 0-3s-0).

## 231.199 Neuroscience, NEURO

Faculty of Medicine and Dentistry

**Note:** Additional courses in Neuroscience are offered by members of the Centre for Neuroscience through individual departments such as Cell Biology, Pharmacology, Physiology, Psychiatry, Psychology, Surgery, and Zoology.

## Undergraduate Courses

#### NEURO 210 Introduction to Clinical Neuroscience

★3 (fi 6) (second term, 3-0-0). An interdisciplinary course designed to introduce students to the field of clinical neuroscience. Students will learn the main features of degenerative brain diseases (such as Alzheimer's disease and multiple sclerosis), developmental disorders of the brain (such as autism), psychiatric disorders (depression, schizophrenia and obsessive compulsive disorder), and brain injury (trauma, stroke and spinal cord injury). Key concepts attempting to explain these disorders in terms of underlying genetic, cellular and cognitive mechanisms will be emphasized. Prerequisite: PSYCO 275.

#### NEURO 375 Functional Neuroanatomy

★3 (fi 6) (first term, 3-0-0). The study of the human central nervous system (CNS), including its development and function from an anatomical perspective. The course will include some disorders of the CNS as they relate to structure and function. Prerequisite: PSYCO 275 or consent of the Department.

#### NEURO 410 Neurobiology of Aging and Neurodegenerative Disorders

★3 (fi 6) (second term, 3-0-0). Designed to provide senior undergraduate students in the Neuroscience program a comprehensive overview of the neurobiology of normal aging and neurodegenerative disorders. Both clinical and basic science aspects of major neurodegenerative disorders such as Alzheimer's disease, Parkinson's disease, Huntington disease, Prion disease and Motor neuron disease (ALS) will be covered. Video presentations of patients with neurodegenerative disorders will be presented to add clinical and psychological dimensions. Additionally, recent papers reporting new developments in each of the above disorders will be discussed. Invited lectures will be given by national/international experts on aspects of neurodegenerative disorders to amplify topics covered in the course. Students can receive credit for either NEURO 410 or 510 but not both. Prerequisites: PMCOL 371.

#### NEURO 443 Neuroendocrine Concepts

★3 (fi 6) (first term, 3-0-0). Regulation within the neuroendocrine system. Conceptual consideration of the diffuse neuroendocrine system, hypothalamopituitary interactions, neural integration, signal inactivation, feedback control, differential regulation, neurosteroids and hormones and behavior. Prerequisite: PHYSYL 210 or equivalent, or PHYSYL 372 or consent of Instructor.

#### NEURO 450 Readings on Selected Topics in Neuroscience

★3 (fi 6) (either term, 3-0-0). An individual study course involving detailed reading on a selected topic in cellular, molecular, systems, or cognitive neuroscience. Students will select a member of the Centre for Neuroscience who will guide them through a course of reading on a specialized topic at an advanced level. Completion of this course requires an oral presentation to an examining committee. Restricted to students in the Honors program in Neuroscience. Registration must be approved by the Centre for Neuroscience. Prerequisites: PMCOL 371, PHYSYL 372.

#### NEURO 451 Honors Research Project in Neuroscience

★3 (fi 6) (first term, 0-0-3). Research project involving laboratory experimentation done under the supervision of a member of the Centre for Neuroscience. Laboratory projects may involve current topics and methodologies encountered in specific areas of cellular, molecular, systems, or cognitive neuroscience. Completion of this course requires a written report of the project and an oral presentation to an examining committee. Restricted to students in the Honors program in Neuroscience. Registration must be approved by the Centre for Neuroscience. Prerequisites: PMCOL 371, PHYSYL 372.

#### NEURO 452 Honors Research Project in Neuroscience

★3 (fi 6) (second term, 0-0-3). Research project involving laboratory experimentation done under the supervision of a member of the Centre for Neuroscience. Laboratory projects may involve current topics and methodologies encountered in specific areas of cellular, molecular, systems, or cognitive neuroscience. Completion of this course requires a written report of the project and an oral presentation to an examining committee at the end of the course. Restricted to students in the Honors program in Neuroscience. Registration must be approved by the Centre for Neuroscience. Prerequisites: PMCOL 371, PHYSYL 372.

#### NEURO 472 Autonomic Nervous System

★3 (fi 6) (second term, 3-0-0). Lectures presented by members of the Centre for Neuroscience on neurophysiological, anatomical, clinical, pharmacological and cellular aspects of the autonomic nervous system. Topics include neural regulation of homeostasis and reproduction, disorders of autonomic function, sympathetically maintained pain, effects of spinal cord injury and current research issues. Prerequisites: PHYSYL 210 or 212/214 or ZOOL 241 or equivalent and PMCOL 202 or 371 or ZOOL 342 or PHYSYL 372.

#### NEURO 496 Computational Neuroscience

★3 (fi 6) (second term, 3-0-0). An interdisciplinary course designed to introduce students in biological science programs (Biology, Neuroscience, Physiology and Psychology) to computational neuroscience, and students in computer science programs to the broad field of neuroscience. Biological science students will learn the basic methods of computer programming, while computer science students will learn the fundamentals of neuroscience. All students will learn how computer simulations can be used to further our understanding of neurons, neuronal networks, processing of sensory information, and control of movements. The lectures are complemented by laboratory exercises that will allow students to develop programming skills and to construct computer simulations of neurophysiological processes. Prerequisites: PMCOL 371 or PHYSYL 372 or CMPUT 340 or permission of instructor.

## Graduate Courses

#### NEURO 500 Research in Neuroscience

★6 (fi 12) (two term, 0-0-6). A practical course in the neurosciences where students spend two months in each of at least three research laboratories approved by the Centre for Neuroscience Graduate Committee. Students are expected to complete a small research project, supervised by a member of the Centre, in each of the research areas chosen. Students are evaluated on both their performance in the laboratory and reports written. Prerequisite: consent of the Centre for Neuroscience. Credit may be obtained for only one of either NEURO 500 or NEURO 501.

#### NEURO 501 Graduate Research Project

★3 (fi 6) (either term, 0-0-6). Individual study. Restricted to students in the Neuroscience Graduate Program. Students will spend one term in the laboratory of a faculty member (other than the supervisor) and carry out a laboratory research project. Successful completion of a written report and an oral presentation is required at the conclusion of the project. Prerequisite: consent of the Centre for Neuroscience. Credit may be obtained for only one of either NEURO 500 or NEURO 501.

#### NEURO 510 Neurobiology of Aging and Neurodegenerative Disorders

★3 (fi 6) (second term, 3-0-0). Designed to provide graduate students in the Neuroscience program a comprehensive overview of the neurobiology of normal aging and neurodegenerative disorders. Both clinical and basic science aspects of major neurodegenerative disorders such as Alzheimer's disease, Parkinson's disease, Huntington disease, Prion disease and Motor neuron disease (ALS) will be covered. Video presentations of patients with neurodegenerative disorders will be presented to add clinical and psychological dimensions. Additionally, recent papers reporting new developments in each of the above disorders will be discussed. Invited lectures will be given by national/international experts on aspects of neurodegenerative disorders to amplify topics covered in the course.

Students can receive credit for either NEURO 410 or NEURO 510 but not both. Prerequisites: PMCOL 371.

### NEURO 572 Current Topics in Autonomic Neuroscience

★3 (fi 6) (either term, 3-0-0). The neurophysiological, anatomical, clinical, pharmacological and cellular aspects of the autonomic nervous system will be studied. Students will also be expected to deliver a lecture-type presentation and an extensive written report on one aspect of autonomic function such as neural regulation of homeostasis, disorders of autonomic function, sympathetically maintained pain, autonomic consequences of spinal cord injury and current research issues. Note that credit is given for either NEURO 472 or 572, not for both. Prerequisite: Consent of the Centre for Neuroscience.

### NEURO 603 Graduate Colloquium in Neuroscience

★3 (fi 6) (second term, 0-2s-0). Graduate students present review seminars or lead discussions based on required readings in the neurosciences. Coordinated by a member of the Centre for Neuroscience. Centre members are invited to attend. Graded on a pass/fail basis.

## 231.200 Norwegian, NORW

Department of Modern Languages and Cultural Studies  
Faculty of Arts

### Notes

- (1) The Department reserves the right to place students in the language course appropriate to their level of language skill.
- (2) Placement tests may be administered in order to assess prior background. Students with a Norwegian language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in a more advanced course more suitable to their level of ability. Students seeking to fulfill their Language Other than English requirement may begin at any one appropriate level, but must take the full ★6 in one language.
- (3) The Department will withhold credit from students completing courses for which prior background is deemed to make them ineligible. For example, 100-level courses are normally restricted to students with little or no prior knowledge in that language. Should a student with matriculation standing, or those possessing prior background (such as native speakers or those for whom it is their first language) register in the 100-level course, credit may be withheld.
- (4) See also listings under Modern Languages and Cultural Studies (MLCS) and Scandinavian (SCAND).

### Undergraduate Courses

#### 0 NORW 111 Beginners' Norwegian I

★3 (fi 6) (either term, 5-0-0). Designed to give basic practical skill in everyday spoken and written Norwegian. The oral approach, using the laboratory, is followed. Note: not to be taken by students with credit in NORW 100, or with native or near native proficiency, or with Norwegian 30 or its equivalents in Canada and other countries.

#### 0 NORW 112 Beginners' Norwegian II

★3 (fi 6) (either term, 5-0-0). Prerequisite: NORW 111 or consent of Department. Note: not to be taken by students with credit in NORW 100, or with native or near native proficiency, or with Norwegian 30 or its equivalents in Canada and other countries.

#### 0 NORW 211 Second-Year Norwegian I

★3 (fi 6) (either term, 4-0-0). Reading and study of selected texts in Norwegian literature and culture. Conversation and composition. Prerequisite: Norwegian 30 (or equivalent) or NORW 112 or consent of Department. Note: not to be taken by students with credit in NORW 200.

#### 0 NORW 212 Second-Year Norwegian II

★3 (fi 6) (either term, 4-0-0). Prerequisite: NORW 211 or consent of Department. Note: not to be taken by students with credit in NORW 200.

## 231.201 Nursing, NURS

Faculty of Nursing

### Undergraduate Courses

#### NURS 113 Pathophysiology

★3 (fi 6) (either term, 3-0-0; 6-0-0 6 weeks). The focus is the application of human anatomy and physiology to the concepts of pathophysiology. Course content will be addressed within the context of underlying disease process and alterations in health. Note: NURS 151 and NURS 113 may not both be taken for credit. Course is for After Degree Nursing Program students only.

The most current Course Listing is available on Bear Tracks.

#### NURS 140 Anatomy

★3 (fi 6) (first term, 3-0-0). Introduction to the structure of the human body. Must be completed prior to Year 2 of the Nursing program.

#### NURS 150 Physiology I

★3 (fi 6) (first term, 3-0-0). An introduction to human physiology. Available only to Nursing students. Must be completed prior to Year 2 of the Nursing program. Pre- or corequisite: NURS 140.

#### NURS 151 Physiology II

★3 (fi 6) (variable, variable). Continuation of the study of human physiology. Available only to Nursing students. Prerequisites: NURS 140 and NURS 150.

#### NURS 190 Nursing in Context A

★5 (fi 10) (first term, 1.5-6s-3 in 6 weeks). Introduction to the professional discipline of nursing, communication theory, and context-based learning. The primary health care emphasis is on health promotion and disease prevention across the life span. Restoration and rehabilitation are introduced. Health assessment and basic nursing skills are introduced.

#### NURS 191 Nursing Practice I

★4 (fi 8) (second term, 1-15c-2 in 7 weeks). Beginning nursing practice with a focus on health promotion and interaction with clients across the life span in a variety of non-traditional settings. Prerequisites: NURS 190 and 194.

#### NURS 194 Nursing in Context A1

★5 (fi 10) (first term, 1.5-6s-3 in 6 weeks). A continuation of the study of concepts introduced in NURS 190 with a focus on teaching and learning principles and increased health assessment and basic nursing skills. Prerequisite: NURS 190.

#### NURS 195 Nursing Practice II

★4 (fi 8) (second term, 1-15c-2 in 7 weeks). Practice includes health status assessment of clients and appropriate health promotion and disease prevention interventions. Practice occurs in settings where clients live or in community agencies (non-acute) where services to clients are offered. Prerequisites: NURS 190 and 194.

#### NURS 215 Pharmacotherapeutics in Nursing

★3 (fi 6) (either term, 3-0-0; 6-0-0 6 weeks). Focuses on the mechanisms of action of drugs, their therapeutic uses and side effect profile. General principles related to drug absorption, distribution, metabolism and excretion will be addressed. The nursing role in promoting optimal therapeutic regimens and in the management of side/adverse effects will be included.

#### NURS 290 Nursing in Context B

★5 (fi 10) (first term, 1.5-6s-3 in 6 weeks). Within the context of primary health care, the focus shifts to restoration, rehabilitation and support of clients experiencing chronic and less acute variances in health. Discussion related to health promotion and disease prevention continues. Intermediate health assessment and nursing skills are introduced. Prerequisites: NURS 140, 150, 190, 191, 194, 195, and MMI 133.

#### NURS 291 Nursing Practice III

★7 (fi 14) (either term, 3-25c-3 in 7 weeks). Practice focuses on restoration, rehabilitation and support (including health promotion and disease prevention) of clients with chronic and less acute variances in health across the life span. Practice occurs primarily in primary-level acute care centres and continuing care agencies. Prerequisites: NURS 140, 150, 190, 191, 194, 195, and MMI 133. Pre- or corequisite: NURS 290.

#### NURS 294 Nursing in Context B1

★5 (fi 10) (second term, 1.5-6s-3 in 6 weeks). Continuation of NURS 290 with increasing situational complexity. Prerequisites: NURS 290, (NURS 291 or 295).

#### NURS 295 Nursing Practice IV

★7 (fi 14) (either term, 3-25c-3 in 7 weeks). Practice focuses on health across the life-span in child-birth facilities, homes, community health clinics, schools and other community based settings. Integration of the concepts of primary health care, health promotion and disease prevention and determinants of health are examined in the community context. Prerequisites: NURS 140, 150, 190, 191, 194, 195 and MMI 133. Pre- or corequisite: NURS 290.

#### NURS 301 Nursing Research

★3 (fi 6) (either term, 3-0-0; 6-0-0 6 weeks). Introduction to the process of research through a comparative analysis of selected studies exemplifying different theoretical, methodological, and analytical approaches. Emphasis is on the communicability of research, the needs of the research consumer, and the development of skills of critical appraisal. Pre- or corequisite for Post RN Program students: NURS 415. Note: (NURS 301 and STAT [★3]) and (NURS 397 and 497) may not both be taken for credit.

#### NURS 303 Introduction to Nursing Theory

★6 (fi 12) (either term, 3-3S-2). Focus is on the basic concepts of the nursing profession and discipline: nursing, person, health and environment. These concepts will be explored within the context of primary health care and changing perspectives of health and how this evolution has impacted the development of the profession of nursing. The philosophical, theoretical, historical, ethical and legal underpinnings of professional nursing practice will be examined. Pre or

Corequisites: NURS 113, 304, and 305. Note: Course is for After Degree Nursing Program students only.

#### **NURS 304 Introduction to Nursing Practice**

★1 (*fi 2*) (either term, 0-4C-0 in 10 weeks). The primary focus is the application of theoretical nursing concepts introduced in NURS 303 and health assessment techniques introduced in NURS 305. This application is addressed within a Primary Health Care framework. Beginning practice will focus on clients experiencing less acute alterations in health across the lifespan. Pre or Corequisites: NURS 303 and 305. Note: Course is for After Degree Nursing Program students only.

#### **NURS 305 Introduction to Health Assessment**

★4 (*fi 8*) (either term, 3-0-3). Focus is on the health assessment of the well adult, with expected aging modifications. The course provides a beginning foundation of assessment skills and technologies necessary for determining client health status within the context of a nursing framework. Factors influencing lifestyles and personal health practices are included. For After Degree Nursing Program and Bilingual Nursing Program students only. Corequisites for After Degree Nursing Program students: NURS 303 and 304. Corequisites for Bilingual Nursing Program students: SC INF 217 and 218. Prerequisites Bilingual Nursing Program students: ANATE 140, PHYSE 152 and MICRE 133.

#### **NURS 307 Acute Care Nursing Theory I**

★6 (*fi 12*) (either term, 2-4S-3). The primary focus is the theoretical foundation for the client-centred care of adults and elderly clients and their families experiencing variations in health (acute and chronic illnesses). Comprehensive assessment and best practice interventions are addressed within the context of a primary health care framework and a nursing model. Corequisites for After Degree students: NURS 215 and 308. Prerequisites for After Degree students: NURS 303, 304, and 305. Corequisites for RPN to BScN students: NURS 215 and 308. Prerequisite for RPN to BScN students: NURS 468. Corequisites for Bilingual Program students: NURS 215 and 308. Prerequisites for Bilingual Program students: SC INF 217, 218, and NURS 305. Note: Course is for After Degree Nursing Program, RPN to BScN Program, and Bilingual Nursing Program students only.

#### **NURS 308 Acute Care Nursing Practice I**

★6 (*fi 12*) (either term, 0-0-16c). The primary focus is the application of theory in the client-centred care of hospitalised adults and elderly clients and their families experiencing variations in health (acute and chronic illnesses). Practice occurs primarily in primary, secondary and tertiary acute care settings. Corequisites for After Degree students: NURS 113, 215 and 307. Prerequisites for After Degree students: NURS 303, 304, and 305. Corequisites for RPN to BScN students: NURS 215 and 307. Prerequisite for RPN to BScN students: NURS 468. Corequisites for Bilingual Program students: NURS 215 and 307. Prerequisites for Bilingual Program students: SC INF 217, 218, and NURS 305. Note: Course is for After Degree Nursing Program, RPN to BScN Program, and for Bilingual Nursing Program students only.

#### **NURS 309 Mental Health Nursing Theory**

★6 (*fi 12*) (either term or Spring/Summer, 3-6S-3 6W; 6-12s-6 3W). Focus is on theory related to the promotion of mental health and the nursing care of people with acute and chronic alterations in mental health. Corequisite: NURS 310. Prerequisites for After Degree students: NURS 113, 215, 307, and 308. Prerequisites for Bilingual Program students: NURS 307 and 308. Note: Course is for After Degree Nursing Program and Bilingual Nursing Program students only.

#### **NURS 310 Mental Health Nursing Practice**

★6 (*fi 12*) (either term or Spring/Summer, 0-0-24C 7W; 0-0-32c 5w). Students will have opportunity to apply concepts of mental health nursing to the care of individuals experiencing acute and chronic alterations in mental health in hospital or community settings. Corequisite: NURS 309. Prerequisites for After Degree students: NURS 113, 215, 307, and 308. Prerequisites for Bilingual Program students: NURS 307 and 308. Note: Course is for After Degree Nursing Program and Bilingual Nursing Program students only.

#### **NURS 341 Using and Interpreting Statistics for Health Research**

★3 (*fi 6*) (either term, 3-0-0; 6-0-0 6 weeks). An introduction to reading, understanding and interpreting commonly used statistics in published health sciences research. Provides hands-on approach to understanding measurement, sampling, and common statistical analysis techniques through critical appraisal of results from published health care studies. Note: (NURS 301 and NURS 341 or equivalent STAT [★3]) and (NURS 397 and 497) may not both be taken for credit.

#### **NURS 390 Nursing in Context C**

★5 (*fi 10*) (first term, 1.5-6s-3 in 6 weeks). Within the context of primary health care focus is on restoration, rehabilitation and support of clients experiencing more acute variances in health. Discussion related to health promotion and disease prevention continues. Advanced health assessment and nursing skills are introduced. Prerequisites: NURS 151, 291, 294, 295.

#### **NURS 391 Nursing Practice V**

★7 (*fi 14*) (either term, 3-26c-2 in 7 weeks). Practice focuses on restoration, rehabilitation, and support (including health promotion and disease prevention) of clients experiencing more acute variances in health across the life-span. Practice

occurs in primary-, secondary-, and tertiary-level acute care settings. Prerequisites: NURS 151, 291, 294, 295. Pre- or corequisite: NURS 390.

#### **NURS 394 Nursing in Context C1**

★5 (*fi 10*) (either term, 1.5-6s-3 in 6 weeks). Continuation of NURS 390 with increasing situational complexity. Prerequisites: NURS 151, 390, (391 or 395).

#### **NURS 395 Nursing Practice VI**

★7 (*fi 14*) (either term, 3-27c-1 in 7 weeks). Practice focuses on restoration, rehabilitation and support (including health promotion and disease prevention) of clients across the life-span who are experiencing more acute variances in health. Practice occurs in homes, acute care settings, or in community-based settings. Prerequisites: NURS 151, 291, 294, 295. Pre- or corequisite: NURS 390.

#### **NURS 397 Nursing Research and Statistics I**

★2 (*fi 4*) (first term, 2-1.5s-0.5 in 7 weeks). Introduction to the process of research through critical appraisals of selected quantitative and qualitative studies. Emphasis is on understanding the research process and knowing how to critically read, analyze, and begin to apply the knowledge gained from research in practice. Focus is on the planning phase of the research process and descriptive statistics. Corequisite: NURS 390. Note: (NURS 397 and 497), and (NURS 301 and STAT [★3]) may not both be taken for credit.

#### **NURS 399 Selected Topics in Nursing Research**

★3 (*fi 6*) (two term, 0-3s-0). The focus is on nursing research, nursing practice, and nursing as a discipline and a profession. Prerequisite: Consent of the Faculty.

#### **NURS 405 Community Nursing Theory**

★6 (*fi 12*) (either term, 2-4s-2). Focus is on the philosophical and theoretical domains of nursing individuals, families and groups in the community across the lifespan. Students will also specifically explore theory related to the nursing care of the child-bearing family. Community nursing management and intervention consistent with the principles of primary health care will be explored and fostered. Corequisite: NURS 406 or SC INF 406. Prerequisites for RPN to BScN and for Bilingual Nursing Program students: NURS 215, 307 and 308. Note: Course is for After Degree Nursing Program, RPN to BScN Program and Bilingual Nursing Program students only.

#### **NURS 406 Community Nursing Practice**

★6 (*fi 12*) (either term, 0-0-16c). Students will have the opportunity to apply concepts of community health nursing. Nursing practice will include health assessment and interventions with child-bearing families. Students will develop competence in both family and community assessments, the use of therapeutic communication skills and the planning, implementation and evaluation of community nursing interventions. Corequisite: NURS 405. Prerequisites for RPN to BScN students: NURS 215, 307 and 308. Note: Course is for After Degree Nursing Program and RPN to BScN and Bilingual Nursing Program students only.

#### **NURS 407 Acute Care Nursing Theory II**

★6 (*fi 12*) (either term, 2-4S-3). A comprehensive approach to primary health care components in the care of clients in complex situations locally, nationally, and internationally. High acuity health assessments and interventions are introduced. Case management, interdisciplinary collaboration, community development, and sociopolitical action are emphasized. Corequisite: NURS 408. Note: Course is for After Degree Nursing Program, RPN to BScN Program, and Bilingual Nursing Program students only.

#### **NURS 408 Acute Care Nursing Practice II**

★6 (*fi 12*) (either term, 0-0-16c). Professional nursing practice focuses on a comprehensive application of primary health care principles to clients experiencing acute variances in health across the life span. Practice occurs in primary, secondary and tertiary level acute care settings. Corequisite: NURS 407. Note: Course is for After Degree Nursing Program, RPN to BScN Program, and Bilingual Nursing Program students only.

#### **NURS 409 Leadership and Issues in Nursing**

★3 (*fi 6*) (either term, 0-3s-0). Using the primary health care framework, a variety of current professional, social, political and global issues affecting the nursing profession and the Canadian health care system will be addressed. Key principles of leadership and management will also be addressed within the context of these issues.

#### **NURS 410 Leadership and Issues in Nursing for Post RN Students**

★3 (*fi 6*) (either term, 0-3s-0). Using the primary health care framework, a variety of current professional, social, political and global issues affecting the nursing profession and the Canadian health care system will be addressed. Key principles of leadership and management will also be addressed within the context of these issues. Note: Course is for Post RN Program students only. Pre- or corequisite: NURS 415.

#### **NURS 415 Community Nursing for Post RN Students**

★5 (*fi 10*) (either term, 0-3S-3/2; 0-6s-3 7weeks). Focus is on concepts related to family and community health. Community nursing management and interventions consistent with the principles of primary health care will be examined.

#### **NURS 461 Nursing Practice VII, Internship Route**

★7 (*fi 14*) (Spring/Summer, 0-1s-34c in 10 weeks). During a Spring/Summer



placement of 10 weeks in a sponsoring agency, the student will manage and care for clients in ambiguous, complex situations. Prerequisites: NURS 390, 391, 394, 395 and 397 or 301. Consent of the Faculty is also required.

#### **NURS 468 Health Assessment**

★4 (fi 8) (either term, 3-0-3). Focus is on the health assessment of the well adult, with expected aging modifications. The course builds on assessment skills and technologies necessary for determining client health status within the context of a nursing framework. Factors influencing lifestyles and personal health practices are included. For Post RN Program and RPN to BScN Program students only.

#### **NURS 470 Nursing in Complex Situations for Post RN Students**

★5 (fi 10) (either term, 0-3S-3/2; 0-6s-3 7 weeks). Nursing of aggregates and communities within the context of primary health care and international/intercultural care are discussed. Concepts of case management, interprofessional teamwork and the role of the nurse as manager are also addressed. Pre- or corequisite: NURS 415.

#### **NURS 475 Community Practice for Post RN Students**

★7 (fi 14) (either term, 0-1.5s-15c; 0-3s-28c 7 weeks). Nursing practice focuses on health promotion and disease prevention of clients across the life-span. Practice occurs in homes or community-based settings. Prerequisite: NURS 415.

#### **NURS 490 Nursing in Context D**

★5 (fi 10) (either term, 1-3S-3/2; 1.5-6s-3 6 weeks). A comprehensive approach to primary health care components in the care of clients in complex, ambiguous situations. Case management and multidisciplinary leadership skills are emphasized. Students may have the opportunity to lead a multidisciplinary student group. Prerequisites: NURS 391, 394, and 395.

#### **NURS 491 Nursing Practice VII**

★7 (fi 14) (either term, 3-26c-2 in 7 weeks). Management and care of clients in ambiguous, complex, situations occurring over a variety of settings. Pre- or corequisite: NURS 490. Prerequisites: NURS 391, 394 and 395.

#### **NURS 492 Nursing Practice VII for Post RN Students**

★7 (fi 14) (either term, 0-1.5s-15c; 0-3s-28c 7 weeks). Comprehensive approach to professional practice of nursing in an area of special interest to the student. Pre- or corequisite: NURS 415.

#### **NURS 494 Nursing in Context D1**

★3 (fi 6) (either term, 0-7s-3 in 4 weeks). Synthesis and focus of nursing knowledge and application of nursing research in a specified area of practice. To be permitted to enroll in this course, students must have passed all courses of their nursing program, except the corequisite NURS 495, or SC INF 495.

#### **NURS 495 Nursing Practice VIII**

★9 (fi 18) (either term, 1-34c-0 in 10 weeks). Comprehensive and consolidated approach to professional practice of nursing. Corequisite: NURS 494. Note: Course is for Collaborative Program, After Degree Program and RPN to BScN Program students only.

#### **NURS 497 Nursing Research and Statistics II**

★4 (fi 8) (either term, 2-5s-1 in 6 weeks). Students continue to develop their skills to critically read, analyze, and begin to use knowledge gained from research in their practice. Building on the knowledge from NURS 397, this course focuses on understanding the implementation phase of research and inferential statistics. Students also examine trends and issues in developing evidenced-based practice for the profession of nursing. Prerequisite: NURS 397. Corequisite: NURS 490. Note: (NURS 397 and 497), and [NURS 301 and STAT (★3)] may not both be taken for credit.

#### **NURS 498 Special Study - Nursing**

★1-12 (variable) (two term, variable).

#### **NURS 499 Scholarly Project in Nursing**

★6 (fi 12) (either term, 0-3s-0). Preparation and presentation of a nursing scholarly project. Prerequisites: NURS 399 and consent of the Faculty.

## **Graduate Courses**

#### **NURS 502 Nature of Nursing Knowledge**

★3 (fi 6) (either term, 0-3s-0). Inquiry into the nature, scope, and object of nursing knowledge and the distinct contribution of nursing art, philosophy, history, and science. Emphasis is placed on how this inquiry is relevant to nursing practice and includes an exploration of nursing theories/frameworks.

#### **NURS 503 Research Foundations**

★3 (fi 6) (either term, 0-3S-1C). In this course, students will learn to identify and defend a significant problem relevant to nursing practice, critically evaluate relevant previous research and frameworks to further explore the problem, develop a researchable question to address the problem and choose an appropriate research approach (design and data collection strategy) to answer the question. Ethical issues of relevance at each step in the research process will also be discussed. Credit for NURS 503 will only be granted once.

#### **NURS 504 Statistics in Nursing Research**

★3 (fi 6) (either term, 0-3s-1L). The focus of this course is on the nature

and characteristics of the most commonly used statistical techniques, their applicability to specific health care problems within the context of nursing, and the interpretation of results. Students will be given an opportunity to develop skills and knowledge in the use of computing software (SPSS) and to reinforce learning through assignments, including the analysis of data sets and discussion/critique of published nursing research.

#### **NURS 505 Transforming Practice**

★3 (fi 6) (either term, 0-3s-0). The focus of this course involves theory and principles of transformative change related to individual performance, multidisciplinary teams, organizational processes, policy, and teaching / learning / pedagogy. Graduates are prepared, in advanced nursing practice roles, to lead individual, team, organizational, and system change in a healthcare or educational setting.

#### **NURS 506 Program Planning**

★3 (fi 6) (either term, 0-3s-0). An introduction to perspectives and research in relation to planning of health promotion and disease prevention initiatives in a variety of practice settings. The focus of this course is implications for nursing and inter-professional practice related to assessment and evaluation. A foundation is provided for program planning, including health education, community organizing, social marketing, and policy advocacy. Theoretical content pertains to models and strategies relevant to multiple levels of client such as population, community, aggregate, or group.

#### **NURS 507 Pharmacotherapeutics**

★3 (fi 6) (either term, 0-3s-0). Graduate seminar on the principles of pharmacotherapeutics and individual differences related to age, gender and clinical conditions. Specific drug classes chosen as having the widest use across nursing specialty areas will be used to illustrate application of pharmacodynamics and pharmacokinetic principles. Lectures are augmented with presentations by content experts and case studies by clinicians. Credit will not be granted to students who have previously received credit for NURS 545.

#### **NURS 508 Health Care Technology and Innovation**

★3 (fi 6) (either term, 0-3s-0). The focus of this course is on the context of healthcare organizations and economics theory relevant to technology or innovation adoption.

#### **NURS 510 Advanced Health Assessment and Applied Pathophysiology - Adult/Older Adult**

★4 (fi 8) (either term, 3s-9c-2). The focus of this course is on the development of advanced assessment and diagnostic reasoning skills for common variations in the health status of adults/older adults. Students will gain an understanding of advanced assessment and applied pathophysiology related to specific health problems in emergent to chronic health care situations. Opportunities to apply clinical diagnostic reasoning skills and decision making required for the assessment of adult/older adult health problems are provided through seminars, laboratory practice, and a clinical practicum. Prerequisite or corequisite: NURS 507.

#### **NURS 511 Advanced Nursing Practice with Children I**

★4 (fi 8) (either term, 3s-9c-2). The focus of this course is to develop advanced physical assessment and history taking skills to inform diagnostic reasoning and clinical decision making for children from birth to 16 years who are experiencing typical childhood health concerns. The course emphasizes developmentally-based assessment and anticipatory guidance for typical childhood development and health experiences. Principles of family-centred care and evidence-based practice are integrated throughout the course. Clinical practice will take place in appropriate community and acute care treatment facilities. Credit will not be granted to students who have previously received credit for NURS 513. Pre or corequisite: NURS 507.

#### **NURS 514 Community and Organization Assessment**

★4 (fi 8) (either term, 0-3s-9c). This course examines nursing assessment of organizations, communities and other populations as a foundation for advanced practice focused on health promotion within organizational and community settings. Course content includes use of data about community/organizational capacity, health status characteristics, and the causes and distribution of disease. Emphasis is placed on a socio-environmental approach to organizational assessment and community health, including the social determinants of health and disease. Both seminar and laboratory experiences are included. Credit will not be granted to students who have previously received credit for NURS 512.

#### **NURS 515 Adv Health Assessment and Applied Pathophysiology - Family / All Ages**

★4 (fi 8) (either term, 3s-9c-2). The focus of this course is on the development of advanced assessment and diagnostic reasoning skills for common variations in health status across the life span. Learners will gain an understanding of advanced assessment and applied pathophysiology related to specific health problems of all ages in primary care situations. Opportunities to apply diagnostic reasoning skills and clinical decision making required for the assessment of a variety of individual health problems are provided through seminars, laboratory practice, and a clinical practicum. Prerequisite or corequisite: NURS 507.

#### **NURS 517 Advanced Perinatal Neonatal Physiology and Physical Assessment**

★4 (fi 8) (either term, 0-3s-9c). The focus of this course is to develop knowledge

in perinatal and neonatal physiology and advanced physical assessment skills for applied diagnostic reasoning and clinical decision-making for neonates in the NICU. Principles of family-centered neonatal care and evidence-based practice are integrated throughout the course. Students will focus on specialized assessment, applied pathophysiology, and current therapeutics in relation to the critically ill neonate through seminars, laboratory practice and a clinical practicum in the NICU. (Level II and Level III). Prerequisite: a minimum of two years of recent clinical experience in a Level III NICU and a current NRP certificate; Instructor approval. Pre or corequisite: NURS 507 Credit will not be granted to students who have previously received credit for NURS 521. Offered in alternate years commencing 2010/11.

#### **NURS 542 Living with Chronicity: Issues and Concepts**

★3 (fi 6) (either term, 0-3s-0). Students explore how persons with a chronic disease or disability and their families adapt to live with this disease or disability, how society influences that adaptation, and how that adaptation affects the integration of persons with a chronic disease or disability into society. Frameworks consistent with a health promotion perspective will also be examined.

#### **NURS 546 Philosophy of Teaching**

★4 (fi 8) (either term, 0-3s-9c). The focus of this course is the exploration of major philosophical positions and their contributions to the teaching learning process. Specifically, it involves an examination of the relationship between philosophical reflection and pedagogical practice within the context of nursing education. Students discuss basic world views that influence contemporary thought about the teaching learning process, critically analyze/deconstruct educational concepts, values and practices and explore how philosophy of teaching influences curricular development and shapes nursing education. Credit will not be granted to students who have previously received credit for NURS 560 - Philosophy of Teaching.

#### **NURS 554 Nursing Leadership in Health Care**

★4 (fi 8) (either term, 0-3s-9c). Theoretical concepts and research issues relevant to leadership in the health care system will be addressed as a basis for senior leadership roles in advanced nursing practice. Relevant topics will be examined including leadership styles, relationship management and negotiations, power, ethical decision making including resource allocation, organization design and change, information and program management, and health policy development. Prerequisite: Undergraduate course in management or consent of Instructor.

#### **NURS 556 Teaching in Nursing Practice**

★4 (fi 8) (either term, 0-3s-9c). Students will explore theories of learning and the related implications for effective educational endeavors in various contexts of nursing practice. The course will facilitate how learning outcomes in nursing practice are influenced by the orientation, characteristics, and actions of those who teach and learn, as well as the resources and constraints within each context where the teaching and learning processes occur.

#### **NURS 560 Topics in Advanced Study in Nursing**

★1-12 (variable) (either term, variable). An elective course aimed at developing in-depth knowledge regarding a topic(s) related to advanced-level nursing. Learning experiences may include clinical experience. Prerequisite: consent of Instructor.

#### **NURS 561 Guided Individual Study in Nursing**

★1-12 (variable) (either term, variable). A course designed for in-depth, individual study of a topic related to advanced-level nursing. Learning experiences may include clinical experience.

#### **NURS 563 Selected Topics in Family/All Ages Nursing**

★4 (fi 8) (either term, 0-3s-9c). Selected topics in a variety of advanced nursing practice specialty areas for case management of individuals and their family in complex health care situations are emphasized. The role of the advanced practice nurse is examined from the perspective of assessing, managing, monitoring, coordinating, and evaluating health status over time. The practical component will provide opportunities to assist individuals and their family within the context of the health care team. Prerequisite: NURS 515 Prerequisite or co-requisite: NURS 575.

#### **NURS 565 Selected Topics in Adult / Older Adult Health Nursing**

★4 (fi 8) (either term, 0-3s-9c). Selected topics in a variety of advanced nursing practice specialty areas for case management of adults in complex health care situations are emphasized. The role of the advanced practice nurse is examined from the perspective of assessing, managing, monitoring, coordinating, and evaluating health status over time. The practical component will provide opportunities to assist adults within the context of the health care team. Prerequisite: NURS 510. Prerequisite or co-requisite: NURS 570.

#### **NURS 567 Child Health and the Family**

★4 (fi 8) (either term, 0-3s-9c). Selected topics in a variety of advanced nursing practice specialty areas for case management of infants, children, and their families in complex health care situations are emphasized. Issues will be examined across settings including hospital, home, school and community. The trajectory of chronological and developmental issues for both the child and the family will be examined. Trends and controversies in the theoretical, research and clinical literature in the field will be addressed. The role of the advanced practice nurse is examined from the perspective of assessing, managing, monitoring, coordinating,

and evaluating health status over time. The practicum component provides opportunities to assist infants, children, and their family within the context of the health care team. Prerequisite: NURS 571.

#### **NURS 570 Advanced Therapeutics and Applied Pathophysiology - Adult/Older Adult**

★4 (fi 8) (either term, 0-3s-9c). The focus of this course is on the acquisition of advanced knowledge and skills essential for clinical decision making in the management of adults/older adults with various health problems. Opportunities are provided to implement and evaluate preventative and therapeutic interventions, as well as health promotion strategies in emergent to chronic health care situations through seminars and a clinical practicum. Prerequisite: NURS 510.

#### **NURS 571 Advanced Nursing Practice with Children II**

★4 (fi 8) (either term, 0-3s-9c). This course builds on NURS 511 to enable students to consolidate skills related to assessment, diagnostic reasoning, health promotion and intervention for children from birth to 16 years and their families. Opportunities are provided to develop knowledge and skills required for assessment, management or appropriate referral for more complex clinical presentations. Clinical practice will take place in appropriate community and acute care treatment facilities managing both emergent and chronic health care situations. Prerequisite: NURS 511.

#### **NURS 574 Health Practice in Communities and Organizations**

★4 (fi 8) (either term, 0-3s-9c). This course critically examines concepts and research in health promotion and disease prevention in organizational and community settings. Emphasis is given to implications for inter-professional practice related to health education, organizational/community development, social marketing, policy advocacy and program evaluation, extending introductory content offered in NURS 514. Theoretical content pertains to models and intervention strategies relevant to multiple client groups such as communities/ organizations, populations, small groups, or aggregates. Credit will not be granted to students who have previously received credit for NURS 531 or NURS 535.

#### **NURS 575 Advanced Therapeutics and Applied Pathophysiology - Family / All Ages**

★4 (fi 8) (either term, 0-3s-9c). The focus of this course is on the acquisition of advanced knowledge and skills essential for clinical decision making in the management of individuals across the life span with various health problems. Opportunities for implementation and evaluation of preventative and therapeutic interventions, as well as health promotion strategies in primary care situations, through seminars and a clinical practicum, are provided. Prerequisite: NURS 515.

#### **NURS 577 Advanced Therapeutics and Applied Pathophysiology - Neonate**

★4 (fi 8) (either term, 0-3s-9c). Students will have the opportunity to integrate theory from advanced physiological, physical assessment, and psychosocial perspectives and to learn advanced clinical skills through case-management of high-risk neonates and their families. This will take place through seminars and labs focusing on clinical case studies and a clinical practicum in the NICU. Clinical placement will be in a Level III NICU. Prerequisite: NURS 517; Instructor approval. Credit will not be granted to students who have previously received credit for NURS 524. Offered in alternate years commencing 2010/11.

#### **NURS 580 Advanced Theory and Practicum in Adult/Older Adult Health Nursing**

★6 (fi 12) (either term, 0-2s-34c). The focus of this course is to provide a culminating practicum experience in the role of the advanced practice nurse with adults / older adults. Integration of theory and research in relation to practice is facilitated by course seminars. Opportunity is provided to discuss issues relevant to the advanced nursing practice role. Prerequisite: NURS 565.

#### **NURS 581 Advanced Practicum in Child Health**

★6 (fi 12) (either term, 0-2s-34c). The focus of this course is practice of advanced nursing skills in the student's selected child health specialty area. Integration of theory and research in relation to practice is facilitated by course seminars. The clinical practicum emphasizes clinical decision-making in an inter-professional environment with a focus on advanced nursing practice with the student as the principal provider of care in collaboration with assigned clinical preceptors. Opportunity is provided to discuss issues relevant to the advanced nursing practice role. Prerequisites: NURS 507, 511, 567 and 571.

#### **NURS 584 Advanced Theory and Practicum in Community / Health Care Organizations**

★6 (fi 12) (either term, 0-2s-34c). This practicum is designed to integrate theoretical knowledge with experience and skill development in the context of community and health care system organization settings. Each student is matched with a mentor who currently occupies a leadership role in a health policy or delivery organization, including community and institutional settings. The mentor will facilitate student entry and experiences in the community and/or organizational context. Seminars and consultation with the Instructor provide opportunities to debrief practicum experiences and integrate theory and practice. Prerequisite: NURS 554 or equivalent.

**NURS 585 Advanced Theory and Practicum in Family/All Ages Nursing**

★6 (*fi 12*) (either term, 0-2s-34c). The focus of this course is to provide a culminating practicum experience in the role of the advanced practice nurse in the student's selected specialty area related to family/all ages health. Integration of theory and research in relation to practice is facilitated through course seminars. Opportunities are provided to discuss issues relevant to the advanced nursing practice role. Prerequisite: NURS 563.

**NURS 586 Teaching Practicum**

★6 (*fi 12*) (either term, 0-2s-34c). This practicum is designed to enhance contextual knowledge and skills relevant to teaching roles in nursing practice which may focus on basic and continuing nursing education, patient education in particular, or health education in general. Based on what is both personally and professionally relevant, each student develops an individualized learning plan and is paired with a teaching preceptor in the area of nursing practice appropriate for the student learning goals. Seminars provide a forum to critically reflect about how teaching and learning can be effectively practiced in the various teaching practicum interests the students bring to the course.

**NURS 587 Advanced Neonatal Intensive Care Nursing Clinical Practicum**

★6 (*fi 12*) (either term, 0-0-50c). This course combines the elective and practicum courses for neonatal clinical instruction. During this practicum the student will acquire skill and experience in functioning in an advanced role as a Neonatal Nurse Practitioner (NNP) under the preceptorship of selected NNPs and neonatologists working in the NICU. Demonstrating the advanced NNP nursing role within an advanced health care setting consistent with established community, national, and professional standards is the main objective of this course. It is understood that in addition to independently seeking out specific learning experiences, the student will take on managing patient care in order to learn and demonstrate the necessary technical, decision making, and case management skills required by the NNP. Prerequisites: NURS 517 and NURS 577; Instructor approval. Credit will not be granted to students who have previously received credit for NURS 529. Offered in alternate years commencing 2010/11.

**NURS 588 Research Practicum**

★6 (*fi 12*) (two term, 0-2s-34c). In the research practicum the student will focus on the acquisition of practical research knowledge and skills. Each student will be assigned to work with one or more faculty mentors with established and active research programs. The faculty mentor(s) will work with the student to ensure an opportunity to participate in a range of research activities.

**NURS 592 International and Intercultural Perspectives in Health and Nursing**

★3 (*fi 6*) (either term, 0-3s-0). The focus of this course is on relationships among health, development, and human resources for health. Emphasis will be placed on fostering an appreciation of the meaning of global, epidemiological, demographic, historical, socio-cultural, environmental, economic, and political contexts in relation to the health of populations, the development of nursing and health services, and the potential for achieving the Millennium Development Goals related to health. Credit will not be granted to students who have previously received credit for NURS 560 - International and Intercultural Perspectives in Health and Nursing.

**NURS 600 Theory Development in Nursing**

★3 (*fi 6*) (either term, 0-3s-0). Exploration of influence and implications of various nursing models, paradigms, and conceptualizations of nursing practice on the development and structure of the discipline of nursing. Prerequisite: consent of Instructor.

**NURS 604 Fundamentals of Aging**

★3 (*fi 6*) (either term, 0-3s-0). A critical analysis of the issues and environments that influence the lives of older Canadians. Focus is on theories and knowledge about age-related normative and non-normative changes and their interaction with the physical, social, community and policy environments of older adults. (Course is cross-listed as HECOL 604). Credit will only be granted for NURS 604 or HECOL 604.

**NURS 610 Contemporary Views of Nursing Science**

★3 (*fi 6*) (either term, 0-3s-0). Enquiry into contemporary philosophic views of the nature of nursing science including natural science, human science, practical science, interpretive, and postmodern views. Prerequisite: consent of Instructor.

**NURS 620 Interpretive Inquiry**

★3 (*fi 6*) (either term, 0-3s-0). This is an advanced course in interpretive inquiry which addresses topics such as interpretive phenomenology, hermeneutics, phenomenology as a philosophical approach and as a research methodology to enhance the development of knowledge in the human sciences. Attention will be directed towards concrete experiences in healthcare practice and within professional disciplines taking into account the ethical relationship between Self and Other as persons (the client, the patient, the student, the professional). As well the course provides an opportunity to learn about the conduct of human science research with an emphasis on the examination of human experiences in nursing and health care practices and the interrelatedness of body, relation, space and time. The practice of hermeneutic writing to achieve description and

interpretation of experience is central to the course. The course is open to students from all disciplines.

**NURS 660 Topics in PhD Studies in Nursing**

★1-12 (*variable*) (either term, variable). A course aimed at developing in-depth knowledge regarding a topic(s) related to PhD-level nursing. Learning experiences may include clinical experience.

**NURS 661 Guided Individual Study in Nursing**

★1-12 (*variable*) (either term, variable). A course designed for in-depth, individual study of a topic related to PhD-level nursing. Learning experiences may include clinical experience.

**NURS 683 Design Problems in Nursing Research**

★3 (*fi 6*) (either term, 0-3s-0). Appraisal of laws of scientific inquiry and designs used in nursing research. Prerequisite: consent of Instructor.

**NURS 684 History and Politics of Nursing**

★3 (*fi 6*) (either term, 0-3s-0). Exploration of the roots of nursing through analysis of the development of the profession within the larger social context. Examines developments at individual and collective levels including selected organizations, events, and individuals central to the evolution of the profession. Prerequisite: consent of Instructor.

**NURS 699 Dissertation Seminar**

★1 (*fi 2*) (either term, 0-1s-0). For PhD in Nursing students, registration required for two terms. Opportunity for discussion of proposed and ongoing research.

**NURS 900 Guided Scholarly Project**

★3 (*fi 6*) (either term, unassigned). A guided scholarly project which will focus on such areas as clinical outcomes, evidence-based practice, quality improvement, or knowledge diffusion.

## 231.202 Nutrition, NUTR

Department of Agricultural, Food and Nutritional Science  
Faculty of Agricultural, Life and Environmental Sciences

**Note:** See also Agricultural, Food and Nutritional Science (AFNS), Animal Science (AN SC), Interdisciplinary (INT D), Nutrition and Food Sciences (NU FS) and Plant Science (PL SC) listings for related courses.

The following courses were renumbered effective 1995-96.

Old	New	Old	New
NU FS 301	NUTR 301	NU FS 302	NUTR 302

### Undergraduate Courses

**O NUTR 100 Nutrition and Wellbeing**

★3 (*fi 6*) (either term, 3-0-0). Principles of nutrition. The need for and functions of the major nutrients for humans. Cannot be taken by students with credit or currently registered in NU FS 305 or other NUTR courses. May contain alternative delivery sections: refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**NUTR 301 Fundamentals of Nutritional Biochemistry and Metabolism I**

★3 (*fi 6*) (first term, 3-0-3/2). Fundamentals of nutrition, emphasizing energy, carbohydrates, lipids and proteins. The lab will use common techniques to illustrate principles of human nutrition. Only open to students in the BSc in Nutrition and Food Science, Nutrition major. Offered concurrently with NUTR 303. Credit will only be given for one of NUTR 301 or 303. Prerequisites: BIOCH 200 and PHYSYL 210. Prerequisite or corequisite: BIOCH 310.

**NUTR 302 Fundamentals of Nutritional Biochemistry and Metabolism II**

★3 (*fi 6*) (second term, 3-0-3/2). Fundamentals of nutrition with emphasis on vitamins and inorganic elements. The lab will use common techniques to illustrate principles of human nutrition. Only open to students in the BSc in Nutrition and Food Science, Nutrition major. Offered concurrently with NUTR 304. Credit will only be given for one of NUTR 302 or 304. Prerequisite: NUTR 301.

**NUTR 303 Fundamentals of Nutritional Biochemistry and Metabolism I**

★3 (*fi 6*) (first term, 3-0-0). Fundamentals of nutrition, emphasizing energy, carbohydrates, lipids, and proteins. Offered concurrently with NUTR 301. Credit will only be given for one of NUTR 301 or 303. Prerequisites: BIOCH 200 and PHYSYL 210. Prerequisite or corequisite: BIOCH 310.

**NUTR 304 Fundamentals of Nutritional Biochemistry and Metabolism II**

★3 (*fi 6*) (second term, 3-0-0). Fundamentals of nutrition with emphasis on vitamins and inorganic elements. Offered concurrently with NUTR 302. Credit will only be given for one of NUTR 302 or 304. Prerequisites: (BIOCH 310 and PHYSYL 210). NUTR 303 or NU FS 305 recommended.

**NUTR 400 Research Methods in Nutritional Science**

★3 (*fi 6*) (first term, 3-3s-0). Familiarizes students with skills required for the formation of a research problem, and for the execution and presentation of empirical research. Lectures incorporate key concepts of experimental design, logistics of data collection and basic analysis and are complemented by work with a faculty advisor to develop a research proposal. Students will present their



proposal in a seminar. Only open to students in the BSc in Nutrition and Food Science, Nutrition major. Prerequisites: NUTR 301, 302, and ★90.

#### **NUTR 401 Undergraduate Nutritional Science Independent Project**

★3 (fi 6) (second term, 0-1s-5). An independent research project on an approved topic, supervised by a faculty member. Normally this is a continuation of work begun in NUTR 400. It includes implementation of a research project, data analysis and presentation of results orally and in writing. Only open to students in the BSc in Nutrition and Food Science, Nutrition major. Prerequisite: NUTR 400.

#### **NUTR 440 Current Topics in Nutritional Science**

★3 (fi 6) (second term, 0-3s-3). Integrated exploration of issues pertaining to nutritional science. Open to fourth-year students in the Nutrition major only. Prerequisites: NUTR 301 and 302, and ★90.

#### **NUTR 443 Diabetes, Cardiovascular Disease and Lifestyle**

★3 (fi 6) (first term, 3-0-0). This is an advanced course examining the relationship between the role of lifestyle factors in the etiology and pathophysiology, as well as the treatment of type 2 diabetes and cardiovascular disease. Application of recent findings to our understanding of these chronic metabolic diseases will be addressed. Graduate students may not register for credit (see AFNS 543). Credit will only be given for one of NUTR 443 and AFNS 543. Prerequisites: NUTR 301 or 303 and NUTR 302 or 304, or consent of Instructor.

#### **NUTR 452 Nutrition in the Prevention of Chronic Human Diseases**

★3 (fi 6) (second term, 3-0-0). A lecture and reading course to address the scientific basis for nutritional intervention in the prevention of chronic human disease. Graduate students may not register for credit (see AFNS 552). Credit will only be given for one of AFNS 552 and NUTR 452. Prerequisites: (NUTR 301 or 303) and (302 or 304) or consent of Instructor.

#### **NUTR 466 Introduction to Dietetic Practice**

★0 (fi 1) (variable, 3-0-0). Lectures and discussion to improve readiness of students to work independently in the development of professional practice skills in dietetics. Open only to students accepted into the Integrated Dietetic Internship. Required before placement in NUTR 469, 470, 471 or 472. Prerequisites: NU FS 223 and NUTR 468. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **NUTR 468 Clinical Nutrition**

★3 (fi 6) (either term, 3-0-3). Basic principles of nutrition in clinical situations. The role of diet in the management of various diseases. The laboratory sessions include practical experience in providing individualized nutritional care for clients from various cultural backgrounds. Graduate students may not register for credit (see AFNS 568). Credit will only be given for one of AFNS 568, NUTR 468, and NU FS 468. Pre- or corequisite: NUTR 301. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **NUTR 469 Introductory Professional Practice in Clinical Dietetics**

★0 (fi 1) (variable, 4 weeks). Practical experience in provision of nutrition care, focusing on basic skills of assessment, planning, implementation and evaluation. Continuing care agencies, rural health centres and acute care hospitals. Students may take this course simultaneously with INT D 411. Open only to students accepted into the Integrated Dietetic Internship. Prerequisites: NU FS 223, NUTR 466, and 468. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **NUTR 470 Professional Practice in Community Nutrition**

★0 (fi 1) (variable, 12 weeks). Practical experience in assessing needs and planning, implementing and evaluating nutrition programs in a variety of community settings. Open only to students accepted into the Integrated Dietetic Internship. Prerequisite: NU FS 223, 377 and NUTR 466. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **NUTR 471 Professional Practice in Foodservice Management**

★0 (fi 1) (variable, 12 weeks). Practical experience in assessment, planning implementation and evaluation of food service systems. Institutional, community and commercial settings. Open only to students accepted into the Integrated Dietetic Internship Program. Prerequisites: (NU FS 363 or 361) and NU FS 461 and (AREC 323 or AG EC 323 or alternate business course). Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **NUTR 472 Professional Practice in Clinical Dietetics**

★0 (fi 1) (variable, 15 weeks). Practical experience in a variety of acute, continuing care and ambulatory care settings. The student is expected to demonstrate professional competencies in assessment, planning, development and monitoring of nutrition care plans for patients and clients. Open only to students accepted into the Integrated Dietetic Internship. Prerequisites: NUTR 466, 469 and 476. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **NUTR 476 Advanced Clinical Nutrition**

★3 (fi 6) (either term, 3-0-3). The principles of diet therapy in selected areas of current interest. Emphasis on case studies, research, and practical problems in clinical dietetics. Graduate students may not register for credit (see AFNS 578). Credit will only be given for one of AFNS 578 and NUTR 476. Prerequisite: NUTR 302 and NUTR 468.

#### **NUTR 477 Advanced Community Nutrition**

★3 (fi 6) (first term, 3-0-3). Builds on concepts learned in introductory community nutrition that relate to health promotion, food security, policy, program planning and community nutrition throughout the lifecycle. Students will develop the skills to write a community grant application. Field trips to places and events that relate to community nutrition. Graduate students may not register for credit (see AFNS 577). Credit will only be given for one of AFNS 577 and NUTR 477. Prerequisites: NUTR 302 and NU FS 377.

#### **NUTR 478 Advanced Nutrition: Energy, Carbohydrates, Lipids, and Proteins**

★3 (fi 6) (first term, 3-0-0). Scientific literature and current issues in the areas of carbohydrates, lipids, and proteins. A major integrative group project is also required. Students cannot obtain credit in both NU FS 478 and NUTR 478. Prerequisites: (NUTR 301 or 303) and (NUTR 302 or 304).

#### **NUTR 479 Advanced Nutrition: Vitamins and Inorganic Elements**

★3 (fi 6) (first term, 3-0-0). A lecture and reading course in vitamins and inorganic elements. Introduction to seminar presentation and critical evaluation of current literature. Students will learn how to write a scientific paper. Graduate students may not register for credit (see AFNS 579). Credit will only be given for one of AFNS 579, NUTR 479 and NU FS 479. Prerequisites: NUTR 301 or 303 and NUTR 302 or 304.

#### **NUTR 480 Sports Nutrition**

★3 (fi 6) (second term, 3-0-0). Basic theory related to nutritional requirements for all levels of athletic performance. Application of sports nutrition concepts for recreational to elite level athletes. Course content includes energy systems, hydration, pre- and post-event nutrition, weight management and body composition issues of athletes and ergogenic aids. Prerequisite: NU FS 305 or (NUTR 301 or 303 and 302 or 304) and ★90.

## Graduate Courses

### Notes

- 400-level courses in NUTR may be taken for credit by graduate students with approval of the student's supervisor or supervisory committee. A 300-level courses may be taken for credit by graduate students with approval of the AFNS Graduate Program Committee. (See §174.1.1(1))
- See Agricultural, Food and Nutritional Science (AFNS) listing for related courses.

## 231.203 Nutrition and Food Sciences, NU FS

Department of Agricultural, Food and Nutritional Science  
Faculty of Agricultural, Life and Environmental Sciences

**Note:** See also Agricultural, Food and Nutritional Science (AFNS), Animal Science (AN SC), Interdisciplinary (INT D), Nutrition (NUTR) and Plant Science (PL SC) listings for related courses.

## Undergraduate Courses

### **NUTR 100 Introduction to Food Science and Technology**

★3 (fi 6) (second term, 3-0-0). An introduction to the nature of food, food technology, food safety. Not open to students in the Nutrition and Food Science degree program who have taken or are currently taking any 200 or higher NU FS courses.

### **NUTR 200 Introduction to Functional Foods and Nutraceuticals**

★3 (fi 6) (second term, 3-0-0). Principles of functional food concepts, health claims, regulations, consumer trends, value added food production, and processing technology, and marketing strategies in the food industry. Prerequisite: NU FS 100 or NUTR 100 or consent of Instructor.

### **NUTR 201 Physical Principles of Food Structure and Functionality**

★3 (fi 6) (first term, 3-1s-0). Theory and application of physical principles important to understanding agri-food structure and physical functionality. Topics include food materials science, flow, and mechanical properties of foods. Physical concepts examined include mechanics, temperature, heat and thermodynamics. Prerequisite: CHEM 102.

### **NUTR 223 The Cultural Ecology of Food and Health**

★3 (fi 6) (either term, 3-0-0). Contemporary dietary patterns, including how food choices are shaped by cultural, social, and economic spheres. The roles of culture

and religion as determinants of healthy eating will be highlighted. Credit will only be given for one of NU FS 223 and 323. Prerequisite: NUTR 100 or NU FS 305.

**O NU FS 283 Introduction to Food Engineering**

★3 (*fi 6*) (second term, 3-0-3). Mass and energy balances, thermodynamics, fluid mechanics, and heat transfer in food systems. Prerequisites: NU FS 201 or (★3 Phys and MATH 113 or 114).

**O NU FS 300 Fundamentals of Dairy Science**

★3 (*fi 6*) (second term, 3-2s-0). Physiology of lactation, Biosynthesis and properties of milk components. Physical, chemical, microbiological, technological and nutritional aspects of milk. Prerequisite: ★3 in Biochemistry. Credit cannot be obtained for NU FS 300 and DAIRY 300.

**NU FS 305 Introduction to the Principles of Nutrition**

★3 (*fi 6*) (first term, 3-0-0). Basic principles of nutrition and metabolism of macronutrients and micronutrients. Students cannot obtain credit in NU FS 305 if they are currently taking or have obtained credit in NUTR 301, 302, 303, or 304. Prerequisites: NUTR 100 or NU FS 100, and ★6 in the sciences (recommended that ★3 be BLOCH).

**O NU FS 312 Quality Assurance**

★3 (*fi 6*) (second term, 3-0-1.5). Statistical methods in quality assurance, sampling plans, control charts, sensory evaluation and risk management in the food industry, HACCP, good manufacturing practices, food regulations, labelling requirements and ISO 9000 standards. Prerequisite: (NU FS 361 or 363) and introductory statistics.

**L NU FS 352 Current Topics and Controversies in Nutrition**

★3 (*fi 6*) (second term, 3-0-0). An advanced course that explores current nutritional recommendations and topical areas of nutrition. Cannot be taken for credit by students in the Nutrition major. Prerequisite: NU FS 305.

**O NU FS 353 Unit Operations in Food Processing**

★3 (*fi 6*) (first term, 3-0-3). Processes used in food manufacturing. Refrigeration, evaporation, sedimentation, centrifugation, filtration, and contact-equilibrium separation methods. Prerequisite: NU FS 283.

**L NU FS 356 Nutrition Across the Lifespan**

★3 (*fi 6*) (second term, 3-0-0). A lecture course that examines the understanding of how nutrients act on a cellular, tissue and whole organism level to influence human growth, development and aging. Students cannot obtain credit in both NU FS 356 and 456. Prerequisite: ★3 of NUTR 301, 303 or NU FS 305.

**NU FS 361 Food Microbiology**

★3 (*fi 6*) (first term, 3-0-3). Environmental factors affecting the growth, activity and destruction of microorganisms in food and their application to control foodborne illness and spoilage in the food processing and food service industries. Given concurrently with NU FS 363, not open to students with credit in NU FS 363. Limited registration. Preference will be given to students in the Food Science and Technology major. Prerequisite: MICRB 265.

**L NU FS 363 Food Microbiology**

★3 (*fi 6*) (either term, 3-0-0). Environmental factors affecting the growth, activity, and destruction of microorganisms in food and their application to control foodborne illness and spoilage in the food processing and food service industries. Given concurrently with NU FS 361, not open to students with credit in NU FS 361. Prerequisite: BIOL 107 or 108 or ★3 in Microbiology.

**NU FS 372 Food Chemistry**

★3 (*fi 6*) (second term, 3-0-3). The fundamental chemistry of major and minor components of food and food additives. The relationship between chemistry and function in food systems is discussed. Laboratory emphasizes analytical techniques. Given concurrently with NU FS 373. Not open to students with credit in NU FS 373. Prerequisites: CHEM (164 or 261) and 263.

**O NU FS 373 Food Chemistry**

★3 (*fi 6*) (second term, 3-1s-0). The fundamental chemistry of major and minor components of food and food additives. The relationship between chemistry and function in food systems is discussed. The project component emphasizes current topics in food chemistry. Given concurrently with NU FS 372. Not open to students with credit in NU FS 372. Prerequisite: (CHEM 164 or 261) and 263.

**NU FS 374 Food Fundamentals and Quality**

★3 (*fi 6*) (either term, 3-0-3). Chemical, physical, and sensory properties of food products and factors affecting food quality in relation to preparation, processing, and storage of foods in the home and institution. Prerequisite or Corequisite: NU FS 372 or 373.

**NU FS 377 Introduction to Nutrition in the Community**

★3 (*fi 6*) (either term, 3-0-0). Examination of nutritional problems in contemporary communities. Community nutrition seeks to improve diets and nutritional status of whole populations by working at the community, provincial, national and international levels. Discussion of nutrition programs and resources. Credit will only be given for one of NU FS 377 and 477. Prerequisite: (NU FS 223 or 323) and (NU FS 305 or NUTR 301).

**O NU FS 400 Undergraduate Reading Project**

★3 (*fi 6*) (either term, 3-0-0). Individual study. Critical reviews of selected literature under the direction of a staff member. Note: For third- and fourth-year students

only. Students must obtain approval from Department before registration. May be taken more than once provided topic is different.

**O NU FS 402 Brewing, Enology, and Food Fermentations**

★3 (*fi 6*) (second term, 3-1s-0). Biological, biochemical, and technical aspects of microbial and fungal fermentations used in the food and beverage industries, especially the lactic acid and alcohol fermentations. Graduate students may not register for credit (see AFNS 502). Credit will only be given for one of AFNS 502 and NU FS 402. Prerequisite: MICRB 265 or NU FS 361 or 363.

**O NU FS 403 Processing of Milk and Dairy Products**

★3 (*fi 6*) (first term, 3-1s-0). Technological principles of milk treatment and processes for fluid milk products; concentrated, dried, sterilized, and fermented dairy products; cheese, butter and ice cream. Graduate students may not register for credit (see AFNS 503). Credit will only be given for one of AFNS 503 and NU FS 403. Prerequisite: NU FS 374 or consent of Instructor.

**O NU FS 404 Muscle Food Science and Technology**

★3 (*fi 6*) (second term, 3-0-3/2). Biological, biochemical, chemical, and technological aspects of the processing of animal muscle food including seafood product technology. Graduate students may not register for credit (see AFNS 504). Credit will only be given for one of NU FS 404 and AFNS 504. Prerequisite: ★3 in Biochemistry.

**O NU FS 406 Science and Technology of Cereal and Oilseed Processing**

★3 (*fi 6*) (first term, 3-0-3/2). Biological, biochemical, chemical, and technological aspects of the processing of cereals and oilseeds. Graduate students may not register for credit (see AFNS 507). Credit will only be given for one of AFNS 507 and NU FS 406. Prerequisite: ★3 in introductory Biochemistry or Biological Science, or NU FS 374 or consent of Instructor.

**NU FS 410 Teaching and Communication in Nutrition**

★3 (*fi 6*) (first term, 3-0-0). Students will gain skills in teaching and communicating nutrition information effectively to different populations (children, elderly, cultural groups, healthcare professionals) using a variety of different approaches and modalities. The theory of learning, communication and behaviour change will provide a foundation for all activities and approaches to evaluation of communication tools will be emphasized. Prerequisites: ALES 204, (NUTR 301 and 302) or (NU FS 305, 356 and 377) and ★90.

**NU FS 424 Nutrition and Metabolism Related to Cancer**

★3 (*fi 6*) (first term, 3-0-0). A lecture and reading course to address nutritional issues specifically related to cancer prevention, diagnosis, treatment and recovery. Graduate students may not register for credit (see AFNS 524). Credit will only be given for one of AFNS 524 and NU FS 424. Prerequisites: (NUTR 301 and 302) or (NU FS 352) and ★6 Biochemistry.

**NU FS 425 Methods and Applications in Nutritional Product Development and Quality Assurance**

★3 (*fi 6*) (second term, 3-0-3). Development of the rationale and concept or prototype of a novel food with beneficial nutritional properties. Practical and theoretical aspects of nutritional product development and quality assurance and current issues in nutrition and health. Students will complete a group project in the area of nutrition and food science. Only open to students in the BSc in Nutrition and Food Science, Nutrition and Food Major. Prerequisites: NU FS 356 and 374. Pre- or corequisite: NU FS 352.

**NU FS 426 Biology, Phytochemistry and Processing of Edible Plants**

★3 (*fi 6*) (first term, 3-0-0). Biological, chemical, technological and nutritional aspects of plant-derived foods such as fruits, vegetables, legumes, nuts, spices and herbs, coffee, tea and cocoa. Impact of processing and storage on product quality and safety. Graduate students may not register for credit (see AFNS 526). Credit will only be given for one of NU FS 426 and AFNS 526. Prerequisite: NU FS 374 or consent of instructor.

**O NU FS 427 Nutritional Toxicology and Food Safety**

★3 (*fi 6*) (first term, 3-0-0). Provides students with an understanding of the principles of risk: benefit evaluations related to the metabolic consequences of exposure to foodborne chemicals and therapeutic agents, and to safety concerns about foods. Graduate students may not register for credit (see AFNS 527). Credit will only be given for one of AFNS 527 and NU FS 427. Prerequisites: ★3 Biochemistry and ★3 Microbiology or consent of instructor.

**NU FS 428 Advances in Functional Foods and Natural Health Products**

★3 (*fi 6*) (second term, 0-3s-0). Overview of regulations, chemistry, bioavailability, nutrient interactions, bioactivity mechanisms and potential therapeutic role of non-nutritive components of functional foods and natural health products in the prevention of chronic disease. Graduate students may not register for credit (see AFNS 528). Credit will only be given for one of AFNS 528 and NU FS 428. Prerequisite: One of NUTR 301, 302 or NU FS 305. ★6 PHYSL recommended.

**NU FS 430 Principles of Sensory Evaluation of Foods**

★3 (*fi 6*) (first term, 3-0-3). Principles and methods of analysis of the sensory properties of foods; appearance, texture, aroma, and taste. Physiology of sensory receptors. Applications, advantages, and limitations of sensory methods. Prerequisites: Introductory statistics and (NU FS 372 or 373).

**NU FS 450 Food Product Development**

★3 (fi 6) (second term, 3-0-3). Design of concept, formulation, processing, packaging and labeling of a new food product and development of quality assurance and marketing strategies. Prototype development in the laboratory and testing of consumer acceptability. Open to fourth-year students in the Nutrition and Food Science, and Food Business Management Programs. Prerequisite: NU FS 374. Pre or corequisite: NU FS 353 or NU FS 403.

**NU FS 454 Unit Operations in Food Preservation**

★3 (fi 6) (second term, 3-0-3). Processes used in food preservation. Dehydration, refrigeration and freezing, sterilization and canning, irradiation. Effect of processing on food properties. Graduate students may not register for credit (see AFNS 554). Credit will only be given for one of AFNS 554 or NU FS 454. Pre- or corequisites: (NU FS 283, 361 (or 363) and 372 (or 373) or consent of instructor.

**NU FS 461 Foodservice Systems Management**

★3 (fi 6) (either term, 3-0-3). Operational techniques and special problems encountered during the preparation and service of food in quantity, in both commercial operations and foodservice establishments. The laboratory sessions will provide experience in quantity food production. Prerequisite: NU FS 223. Pre- or corequisite: NU FS 374. AREC 323 recommended. May contain alternate delivery sections: refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**NU FS 480 Foodborne Pathogens**

★3 (fi 6) (second term, 3-1s-0). Established and emerging causative agents of microbial foodborne illness, their significance and control in the food chain. Rationale for regulatory intervention to enhance the microbiological safety of foods. Graduate students may not register for credit (see AFNS 580). Credit will only be given for one of AFNS 580 and NU FS 480. Prerequisite: MICRB 265 or NU FS 361 or 363.

**NU FS 481 Advanced Foods**

★3 (fi 6) (second term, 3-0-0). Critical evaluation of current literature on the effects of ingredients and processing on quality characteristics of foods. Graduate students may not register for credit (see AFNS 581). Credit will only be given for one of AFNS 581 and NU FS 481. Prerequisites: NU FS 374 and ★3 Biochemistry or consent of instructor.

**NU FS 490 Innovations in Food Science**

★3 (fi 6) (first term, 3-0-0). Integrated exploration of emerging concepts and novel technologies in food science with focus on high pressure treatment, food packaging, hygienic design and the use of enzymes in food. Pre- or corequisites: NU FS 283, (NU FS 372 or 373) and (NU FS 361 or 363).

**NU FS 499 Advanced Agri-Chemical Analysis**

★3 (fi 6) (second term, 3-0-3). Advanced analysis of food and agri-industrial materials with a focus on good laboratory practices (GLP), chromatographic techniques (HPLC, GC), mass spectrometry, and other modern techniques from sample preparation to analysis of data. Graduate students may not register for credit (see AFNS 599). Credit will only be given for one of AFNS 599 and NU FS 499. Prerequisite: NU FS 372 or consent of Instructor.

**Graduate Courses****Notes**

- (1) 400-level courses in NU FS may be taken for credit by graduate students with approval of the student's supervisor or supervisory committee. 300-level courses may be taken for credit by graduate students with approval of the AFNS Graduate Program Committee.
- (2) See Agricultural, Food and Nutritional Science (AFNS) listing for related courses.

**231.204 Obstetrics and Gynaecology, OB GY**

Department of Obstetrics and Gynaecology  
Faculty of Medicine and Dentistry

**Undergraduate Courses****OB GY 546 Obstetrics and Gynaecology Student Internship**

★6 (fi 12) (either term, 6 weeks). Student internship in obstetrics and gynaecology for students registered in the MD program.

**231.205 Occupational Therapy, OCCTH**

Department of Occupational Therapy  
Faculty of Rehabilitation Medicine

**Note:** All OCCTH courses are open to Occupational Therapy students only except OCCTH 206 which are open to all students.

**Undergraduate Courses**

The most current Course Listing is available on Bear Tracks.

**OCCTH 206 Applied Interpersonal Communication**

★3 (fi 6) (either term, 3-0-0). Interpersonal communication theory and application to health care. Integration and application of values and attitudes as they affect professional/client relationships. Students with credit in OCCTH 106 will not be permitted to take OCCTH 206.

**OCCTH 328 Fieldwork**

★4.5 (fi 9) (either term, 8 weeks). Credit. Practical experience in approved facilities and community agencies. Prerequisites: consent of Department; OCCTH 324 and completion of all Year 3 academic courses; attendance at Professional Development Seminar.

**OCCTH 414 Core 4: Advanced Application of Occupational Therapy Principles Across the Lifespan**

★6 (fi 12) (either term). Application of occupational therapy principles and evidence-based practice, focusing on children and older adults using a lifespan approach, current theories, and complex integrated case studies. Prerequisites: OCCTH 310, 328. Corequisite: REHAB 455.

**OCCTH 415 Core 5: Integration in Specialty Practice Areas**

★4 (fi 8) (either term, 52 hours). Application of assessment and intervention strategies in the areas of psychiatry, neurology and work evaluation. Prerequisites: all clinical and completion of academic course work in Year 3 and Fall Term of Year 4. Corequisites: REHAB 454, INT D 410.

**OCCTH 420 Analysis and Synthesis of Occupational Therapy Principles**

★2 (fi 4) (either term, 0-2s-0). Focuses on clinical strategies for complex cases in physical and psychosocial domains of practice. Students will complete an Objective Structured Clinical Examination (OSCE) during the course. Prerequisites: completion of 3rd year courses in the Occupational Therapy Program.

**OCCTH 428 Fieldwork**

★3 (fi 6) (either term, 5 weeks). Credit. Practical experience in approved facilities and community agencies. Prerequisites: consent of Department; attendance at Professional Development Seminar; OCCTH 328 and completion of Year 4 Fall Term academic courses.

**OCCTH 433 Fieldwork**

★3 (fi 6) (either term, 5 weeks). Credit. Practical experience in approved facilities and community agencies. Prerequisites: consent of Department, OCCTH 428 and completion of Year 4 academic courses.

**OCCTH 434 Fieldwork**

★3 (fi 6) (either term, 5 weeks). Credit. Practical experience in approved facilities and community agencies. Prerequisites: consent of Department, OCCTH 433 and completion of Year 4 academic courses.

**OCCTH 486 Student Selected Modules**

★1 (fi 2) (either term, 13 hours). Students must successfully complete a minimum of five modules in different topics. Note: Course title is variable; course may be repeated. This is a CR/NC course.

**OCCTH 499 Individual Study**

★3 (fi 6) (either term, 0-3s-0). A course intended to allow the senior undergraduate student to pursue a topic of interest in more depth than the classroom structure permits. This may take the form of directed reading, laboratory or clinical experience. Prerequisite: Departmental consent.

**Graduate Courses**

**Note:** Open only to graduate students in Occupational Therapy program unless departmental consent is granted.

**OCCTH 501 Theory and Practice of Enabling Occupation**

★2 (fi 4) (either term, 0-2s-0). Conceptual models and theoretical approaches applied to occupational therapy practice. Corequisites: OCCTH 502, 503, 504, 510, 518, 562.

**OCCTH 502 Assessment and Evaluation of Occupational Performance**

★3 (fi 6) (either term, 0-3L-0). Occupational therapy theoretical foundations, clinical reasoning, and practical approaches for the identification of occupational performance deficits. Students will learn the evaluation standards of rigour, and develop practical skills for identifying and evaluating individuals' performance problems and concerns in line with their disability, prognosis and environmental situations. Corequisites: OCCTH 501, 503, 504, 510, 518, 562.

**OCCTH 503 Professionalism and Supervision in Practice**

★2 (fi 4) (two term, 0-2s-0). Underpinned by theoretical perspectives, a structure is provided for students to (a) self-evaluate and demonstrate professionalism and (b) work effectively with those for whom they have supervisory responsibilities.

**OCCTH 504 Occupation, Health and Society**

★2 (fi 4) (either term, 0-2L-0). The study of: a) occupation and its relationship to functioning, disability, health and wellbeing; and b) the role of occupation in society. Corequisites: OCCTH 501, 502, 503, 510, 518, 544, 562.



**OCCTH 505 Theory and Instrumentation in Occupational Therapy Practice**

★3 (*fi 6*) (either term, 0-3s-0). The theory of occupational therapy and its relationship to client assessment. Pre- or corequisite: EDPY 500 or equivalent.

**OCCTH 506 Instrumentation Theory in Occupational Therapy**

★2 (*fi 4*) (either term, 0-2s-0). Measurement principles and their application to occupational therapy. Restricted to students registered in the MSc in OT course-based route.

**OCCTH 510 Theory, Evidence and Skills in Practice: Application**

★1 (*fi 2*) (either term, 0-1L-0). Application of occupational therapy principles and skills, supported by evidence-based practice, in physical and mental health, functioning, participation and activities. Corequisites: OCCTH 501, 502, 503, 504, 518, 544, 562.

**OCCTH 512 Core 5: Integration in Speciality Practice Areas**

★4 (*fi 8*) (either term, 52 hours). Application of assessment and intervention strategies in the areas of psychiatry and work evaluation. Corequisites: REHAB 454, INT D 410.

**OCCTH 518 Influences on Occupational Performance: Mental Health**

★4 (*fi 8*) (two term, 0-4L-0). Occupational performance deficits, resulting from mental health conditions, and occupational therapy interventions. Using case studies students will explore assessment and intervention approaches in occupational therapy practice. Corequisites: OCCTH 510, 520, 544, INT D 410.

**OCCTH 519 Enabling Occupation: Mental Health**

★2 (*fi 4*) (either term, 0-2s-0). An in-depth analysis of the process and practice of mental health treatment techniques used occupational therapy. Prerequisites: Completion of all Year 1 academic and fieldwork courses. Corequisites: OCCTH 530, 545.

**OCCTH 520 Theory, Evidence and Skills in Practice: Integration**

★1 (*fi 2*) (either term, 0-1L-0). Case based clinical reasoning to integrate occupational therapy theory and values in the selection of intervention media and modalities for physical and mental health, physical and mental health, functioning, participation, and activities. Prerequisites: Completion of all Year 1 Fall Term courses. Corequisites: OCCTH 544, 563.

**OCCTH 521 Program Evaluation in Occupational Therapy**

★3 (*fi 6*) (either term, 0-3s-0). Designed to equip the student with the resources and skills to evaluate occupational therapy program delivery.

**OCCTH 524 Fieldwork-Learning in a Practice Context**

★1.5 (*fi 3*) (either term, 4 weeks). Practical experience and application of knowledge and skills gained in fall term courses, in approved facilities and community agencies. Students will be expected to complete specific projects designed to assimilate the core knowledge of occupational therapy theory. Prerequisite: attendance at Fieldwork Orientation. Corequisites: All Year 1 Fall Term academic courses and attendance at Fieldwork Orientation.

**OCCTH 525 Fieldwork-Learning in a Practice Context**

★3 (*fi 6*) (either term, 6 weeks). Practical experience and application of Year 1 courses in approved facilities and community agencies. Students will be expected to complete specific projects designed to integrate the core knowledge of occupational therapy theory. Prerequisites: consent of Department; attendance at mandatory fieldwork session(s); completion of all Year 1 academic courses.

**OCCTH 526 Fieldwork - Learning in a Practice Context**

★3 (*fi 6*) (either term, 6 weeks). Practical experience in approved facilities and community agencies. Prerequisites: Consent of Department; attendance at mandatory fieldwork session(s); completion of all Year 1 and Year 2 Fall Term academic courses; OCCTH 525.

**OCCTH 527 Fieldwork-Learning in a Practice Context**

★3 (*fi 6*) (either term, 6 weeks). Practical experience in approved facilities and community agencies. Prerequisites: consent of Department; attendance at mandatory fieldwork session(s); completion of all Year 2 academic courses; OCCTH 526.

**OCCTH 528 Fieldwork - Learning in a Practice Context**

★3 (*fi 6*) (either term, 6 weeks). Practical experience in approved facilities and community agencies. Prerequisites: consent of Department; attendance at mandatory fieldwork session(s); completion of all Year 2 academic courses; OCCTH 527.

**OCCTH 530 Theory, Evidence and Skills in Practice: Synthesis**

★1 (*fi 2*) (either term, 0-1L-0). The use and design of interventions for physical and mental health, functioning, participation, and activities supported by the analysis and synthesis of occupational therapy principles. Prerequisites: Completion of all Year 1 academic and fieldwork courses. Corequisites: OCCTH 545, 564.

**OCCTH 531 Fieldwork**

★3 (*fi 6*) (either term, 5 weeks). Credit. Practical experience in approved facilities and community agencies. Prerequisites: consent of Department and completion of EDPY 500; INT D 410; OCCTH 506, 512, 521; and REHAB 454 and 500.

**OCCTH 536 Fieldwork**

★3 (*fi 6*) (either term, 5 weeks). Credit. Practical experience in approved facilities

and community agencies. Prerequisite: consent of Department and completion of OCCTH 531.

**OCCTH 540 Theory, Evidence and Skills in Practice Evaluation**

★1 (*fi 2*) (either term, 0-1L-0). Application and evaluation of occupational therapy intervention media and modalities for physical and mental health functioning, participation, and activities. Prerequisites: Completion of all Year 1 academic and fieldwork courses and Year 2, Fall Term academic and fieldwork courses. Corequisite: OCCTH 545.

**OCCTH 543 Student Selected Modules**

★1 (*fi 2*) (either term, 13 hours). Students must successfully complete either a minimum of three modules in different topics or one ★3 Individual Study (OCCTH 599 or equivalent). Note: Course title is variable; course may be repeated. This is a CR/NC course.

**OCCTH 544 Practical Skills (Year 1)**

★1.5 (*fi 3*) (two term, 0-0-1.5). Experiential course introducing selected key occupational therapy practice skills. Corequisites: All Year 1 Fall and Winter Term academic and fieldwork courses.

**OCCTH 545 Practical Skills (Year 2)**

★1 (*fi 2*) (either term, 0-0-1). Experiential course building on occupational therapy practice skills learned in first year courses, as well as skills associated with selected 2nd year courses. Prerequisites: Completion of all Year 1 academic and fieldwork courses. Corequisite: OCCTH 519.

**OCCTH 553 Influences on Occupational Performance: Human Systems III -Adaptability of the Nervous System**

★3 (*fi 6*) (either term, 3-0-0). Principles of nervous system adaptation and plasticity over the lifespan, with an emphasis on nervous system response to injury and disease, and the biological basis for occupational performance. Prerequisites: Completion of all Year 1 academic and fieldwork courses. Corequisites: OCCTH 530, 557.

**OCCTH 554 Enabling Occupation through Neurological Rehabilitation**

★3 (*fi 6*) (either term, 0-3L-0). Occupational therapy for neurological conditions encountered in practice. Prerequisites: Completion of all Year 1 academic and fieldwork courses and Year 2, Fall Term academic and fieldwork courses. Corequisites: OCCTH 540, 558.

**OCCTH 557 Enabling Occupation: Across the Lifespan**

★6 (*fi 12*) (two term, 0-6L-0). Application of occupational therapy principles, supported by evidence-based practice, with an emphasis on children and older adults, using current theories and complex integrated case studies. Prerequisite: Completion of all Year 1 academic and fieldwork courses.

**OCCTH 558 Enabling Occupation: Community**

★2 (*fi 4*) (either term, 0-2s-0). Application and integration of occupational therapy principles and practice in community settings. The focus is on complex care and chronic degenerative conditions. Prerequisite: Completion of all Year 1 academic and fieldwork courses and Year 2, Fall Term academic and fieldwork courses.

**OCCTH 559 Enabling Occupation: Return to Work**

★2 (*fi 4*) (either term, 0-2s-0). The relationship between the client's occupational performance strengths and resources and the demands of work environments are investigated in relation to establishing meaningful roles. Prerequisite: Completion of all Year 1 academic and fieldwork courses and Year 2, Fall Term academic and fieldwork courses; Corequisite: OCCTH 540.

**OCCTH 562 Evidence-Based Practice in Occupational Therapy**

★3 (*fi 6*) (either term, 0-3s-0). Critical evaluation of occupational therapy and related literature including methodology and design. Corequisites: All Year 1 Fall Term academic and fieldwork courses.

**OCCTH 563 Research Design and Knowledge Translation**

★3 (*fi 6*) (either term, 3-0-0). Examination of: (a) research methodology and design as they (i) apply to the development of a project proposal and (ii) as they affect published findings in the literature; and (b) consideration of how knowledge is translated into occupational therapy practice. Prerequisites: Completion of all Year 1 Fall Term academic and fieldwork courses. Corequisites: OCCTH 518, 544.

**OCCTH 564 Evaluation of Occupational Therapy Services**

★2 (*fi 4*) (either term, 0-2s-0). The integration of social research procedures with occupational therapy models for evaluating the processes, structures and outcomes of programs and services to which occupational therapists contribute. Prerequisites: Completion of all Year 1 academic and fieldwork courses. Corequisite: OCCTH 565.

**OCCTH 565 Scholarly Practice**

★1 (*fi 2*) (either term, 0-1s-0). This course will further the students' knowledge of the resources and skills required for successful completion of OCCTH 900 Directed Final Project. Prerequisites: Completion of all Year 1 Fall Term academic and clinical courses.

**OCCTH 583 Influences on Occupational Performance: Human Systems I**

★4 (*fi 8*) (either term, 4-0-1). The study of: (a) physical human systems and occupational performance deficits resulting from illness, injury, and disease; and

(b) the concurrent development of related assessment skills and occupational therapy interventions. Prerequisites: Completion of all Year 1 Fall Term academic and fieldwork courses. Corequisites: OCCTH 520, INT D 410.

**OCCTH 584 Influences on Occupational Performance: Human Systems II**  
★2 (*fi 4*) (either term, 0-2s-0). Occupational performance deficits resulting from illness, injury, and disease and the application of related assessment skills and occupational therapy interventions. Prerequisites: Completion of all Year 1 Fall and Winter Term academic and fieldwork courses.

**OCCTH 586 Student Selected Modules**

★1 (*fi 2*) (either term, 13 hours). Students must complete a minimum of three modules in different topics. Topics completed as undergraduate students in OCCTH 486 cannot be repeated. Note: Course title is variable; course may be repeated. This is a CR/NC course.

**OCCTH 598 Special Seminars**

★3 (*fi 6*) (either term, 0-3s-0). Content varies from year to year. Topics will be announced prior to registration period. Prerequisite: consent of Department. May be repeated.

**OCCTH 599 Individual Study**

★3 (*fi 6*) (either term, 0-3s-0). Designed to allow a student to pursue a topic of interest in more depth than permitted by existing courses. Prerequisite: Departmental approval of plan of study. May be repeated.

**OCCTH 900 Directed Final Project**

★6 (*fi 12*) (variable, unassigned). The synthesis of academic knowledge, with fieldwork experiences and directed to the exploration of a specific topic, relevant to occupational therapy. Students will demonstrate inquiry, reflection and critical thinking. Students will demonstrate inquiry, reflection and critical thinking through required participation in seminars, a written report and a conference style presentation.

## 231.206 Oncology, ONCOL

Department of Oncology  
Faculty of Medicine and Dentistry

### Undergraduate Courses

**ONCOL 320 Introduction to Oncology**

★3 (*fi 6*) (first term, 3-0-0). Provides an introduction to oncology with an emphasis on the molecular and cellular biology of cancer. Specific topics include the genetic basis of cancer, the control of cell proliferation, metastasis, tumour immunology, angiogenesis, and cancer therapies. Prerequisite: BIOL 201 or CELL 201 with a minimum grade of C, or consent of the Department.

### Graduate Courses

Note: See also PMCOL 505, MED 573, PHYS 475 and PHYS 477.

**ONCOL 510 Issues in Psychosocial Oncology**

★3 (*fi 6*) (first term, 3-0-0). The general objective of the course is to explore specific clinical and research issues in psychosocial oncology through guided independent study and presentation. The course is primarily designed to fit into masters and doctoral programs in a range of disciplines including psychology, educational psychology, social work, family studies, nursing, and pastoral care. It is also open to students in other disciplines who are considering a career in oncology. Issues in psychosocial oncology such as the mind-body connection, coping strategies, cancer and its impact on the family, grief and loss issues, survivorship issues and many other related topics will be explored. Course assignments will allow students from different disciplines to investigate their own areas of particular interest. Prerequisite: consent of Department.

**ONCOL 520 Tumor Biology**

★3 (*fi 6*) (second term, 3-0-0). The course will provide an introduction to the basic science of oncology. Topics to be covered comprise: the genetic basis of cancer, including the role of proto-oncogenes and tumor suppressor genes; mechanisms of carcinogenesis and radiation-sensitivity, including DNA repair and cell cycle control; the molecular basis of tumor metastasis, including cell motility, tumor cell invasion, and extravasation; tumor immunology and angiogenesis. Course offered in alternate years. Prerequisites: BIOCH 200, and one of the following: BIOCH 320 or 330 or ONCOL 320.

**ONCOL 522 Biological Complexity and Cancer**

★3 (*fi 6*) (second term, 0-3s-0). A seminar course based on concepts of biological organization as key events in tumorigenesis. The course uses an interdisciplinary approach to examine the limitations of current paradigms, and to evaluate new alternative models. Topics will include the stem cell hypothesis, hyper-networks, quantitative modeling of cell signaling, signal compartmentalization, and lipid-protein interactions. Designed for graduate students; final year undergraduates may register with consent of the Department. Offered in alternate (odd-numbered) years.

**ONCOL 535 Clinical Radiobiology**

★1.5 (*fi 3*) (either term, 1.5-0-0). An introduction to the physics, chemistry, and biology of radiation effects on cells and tissues. Concepts discussed are focused on those of relevance to the treatment of cancer with ionizing radiation. Prerequisite: consent of Department.

**ONCOL 550 Medical Radiation Physics**

★3 (*fi 6*) (first term, 3-0-0). Fundamentals of radiation physics, production and properties of ionizing radiation and their interactions with matter and tissue. Interactions of photons and of charged particles with matter. Concepts of radiation dosimetry (theoretical and experimental, cavity theory and ionization chambers). Consent of Department required.

**ONCOL 552 Fundamentals of Applied Dosimetry**

★3 (*fi 6*) (second term, 3-0-0). Theory and practical techniques of external beam radiotherapy and brachytherapy. Topics include single and multiple external beams, scatter analysis, inhomogeneity corrections, fundamentals of brachytherapy, and brachytherapy dosimetry systems. Prerequisite: ONCOL 550.

**ONCOL 554 Laboratory in Medical Radiation Physics**

★2 (*fi 4*) (Spring/Summer, 0-0-4). Practical aspects of medical physics as applied to radiation therapy. Exposure to the operation of various therapy units and dose measuring devices. Application of techniques to measure physical parameters of radiation beams. Introduction to radiation treatment planning with techniques for specific tumor sites. Prerequisite: ONCOL 550. Corequisite: ONCOL 552.

**ONCOL 556 Laboratory in Imaging**

★2 (*fi 4*) (Spring/Summer, 0-0-4). Provides clinical and practical experience with diagnostic imaging equipment, to adequately provide consultative support required of a clinical medical physicist in imaging. Perform calibration and quality assurance procedures on medical imaging modalities. Prerequisites: ONCOL 550 and 562. Corequisites: ONCOL 568 and 564.

**ONCOL 558 Health Physics**

★2 (*fi 4*) (first term, 2-0-0). Sources of radiation, basic dosimetry, and hazards of ionizing radiation. Basics of radiation safety. Techniques for the detection, use, and safe handling of radiation sources. Radiation safety codes, laws and regulations. Consent of Department required.

**ONCOL 560 Technology in Radiation Oncology**

★2 (*fi 4*) (first term, 2-0-0). Explore the use of computers and electronics in the diagnosis, tumour and normal tissue localization, treatment planning, treatment delivery, and treatment verification as applied to cancer patients. Computing tools for the Medical Physicist. Consent of Department required.

**ONCOL 562 Theory of Medical Imaging**

★3 (*fi 6*) (first term, 3-0-0). A system theory approach to the production, analysis, processing and reconstruction of medical images. An extensive use of Fourier techniques is used to describe the processes involved with conventional radiographic detectors, digital and computed radiography. Review and application of image processing techniques used in diagnostic and therapeutic medicine. Consent of Department required.

**ONCOL 564 Physics of Nuclear Medicine**

★3 (*fi 6*) (second term, 3-0-0). Discussion of the fundamental physics of radioactivity, the use of unsealed sources in medical diagnosis and treatment. Unsealed source dosimetry, nuclear measurement instrumentation, spectrometry. Design and function of gamma cameras, single photon emission tomography, and positron emission tomography. Prerequisites: ONCOL 550 and 562.

**ONCOL 566 Radiation Biophysics**

★3 (*fi 6*) (first term, 3-0-0). Theories and models of cell survival, survival and curve and its significance, modification of radiation response. Radiobiology of normal and neoplastic tissue systems. Late effects of radiation on normal tissue, radiobiological modeling of normal tissue complication, probability and tumor control probability. Consent of Department required.

**ONCOL 568 Physics of Diagnostic Radiology**

★3 (*fi 6*) (second term, 3-0-0). Rigorous development of the physics of x-ray production, interaction and detection in diagnostic radiology, including mammography. In-depth analysis of analog and digital systems in radiography and fluoroscopy is given. The description and design of computed tomographic systems as well as the associated reconstruction algorithms from single to multislice helical systems are studied. Prerequisites: ONCOL 550, 562.

**ONCOL 570 Directed Reading in Experimental Oncology**

★3 (*fi 6*) (either term, 0-3s-0). Reading and discussion of current research literature on selected topics in experimental oncology under the direction of one or more faculty members. Topics presently available include cell adhesion mechanisms, cell cycle regulation, DNA repair, radiotherapy and susceptibility and resistance, oncogenes/tumor suppressor genes, and tumor cell metastasis. Notes: (1) Grades will be based on participation in group discussions and/or written reports from assigned readings with emphasis on critical evaluation of the subject matter. (2) Students in other graduate programs may register with the consent of Instructors. Prerequisite: consent of Department.

**ONCOL 600 Graduate Medical Physics Seminar**

★2 (*fi 4*) (two term, 0-1s-0). Weekly seminars given by faculty on topics of interest to the medical physics community that are not formally included with the other didactic courses. Includes medical statistics, anatomy/physiology for medical physics, site-specific cancer, experience in clinic, inverse treatment planning optimization, photodynamic therapy, proton and neutron therapy, and image fusion. No prerequisite.

**ONCOL 620 Recent Advances in Cancer Research**

★3 (*fi 6*) (first term, 0-3s-0). A directed reading and seminar course based on recent developments in the cellular and molecular biology of cancer. The students will critically review papers selected from the recent literature and give oral presentations. Prerequisites: ONCOL 520 and consent of Department. Offered in alternate years.

**ONCOL 660 Current Topics in Cancer Research**

★2 (*fi 4*) (second term, 0-1.5s-0). A general seminar/discussion course on recent advances in a wide range of topics related to cancer development and management. Selected topics include experimental therapeutics, molecular oncogenetics, tumour immunobiology, DNA repair, and cell cycle regulation. Notes: (1) all graduate students in the Department of Oncology are expected to attend the seminars whether or not they are registered in the course. (2) All graduate students in the Department of Oncology should register in the course in their second year and present a seminar based on their research project. (3) All graduate students registered in ONCOL 660 will write a paper on a selected topic. Restricted to graduate students in the Department of Oncology.

**ONCOL 661 Current Topics in Cancer Research II**

★1 (*fi 2*) (first term, 0-1s-0). A general seminar course based on recent advances in a wide range of topics related to cancer. Note: Oncology 661 should be taken in the first term of the year in which Oncology 660 is taken. Graduate students must obtain one credit from ONCOL 661 in order to meet the minimum requirements for the MSc and PhD programs in the Department of Oncology. Restricted to graduate students in the Department of Oncology.

**ONCOL 690 Biomedical Magnetic Resonance Methods and Applications**

★3 (*fi 6*) (either term, 3-0-0). Advanced course on modern magnetic resonance techniques including in-depth description of hardware; advanced imaging sequences and image reconstruction methods; methodologies for in-vivo magnetic resonance spectroscopy. Prerequisite: BME 564 and consent of Instructor.

**ONCOL 691 Advanced Magnetic Resonance Physics**

★1 (*fi 2*) (two term, 0-1s-0). Guided reading course with preparation and delivery of teaching lectures on a current topic of Magnetic Resonance research in conjunction with ONCOL 692 and 693 presentations. Prerequisite: ONCOL 690 and consent of Instructor.

**ONCOL 692 Advanced Radiological and Nuclear Imaging Physics**

★3 (*fi 6*) (either term, 3-0-0). Guided reading course in advanced ultrasound, fluoroscopy, X-ray CT, or nuclear imaging with preparation and presentation of teaching lectures in conjunction with ONCOL 691 and 693 presentations. Prerequisite: ONCOL 562, 564, 568, 600, and consent of Instructor.

**ONCOL 693 Advanced Radiotherapeutic Physics**

★3 (*fi 6*) (either term, 3-0-0). Guided reading course with preparation and delivery of teaching lectures in novel radiotherapeutic techniques, advanced radiation techniques and delivery in conjunction with ONCOL 691 and 692 presentations. Prerequisite: ONCOL 550, 552, 600, and consent of Instructor.

## 231.207 Operations Management Research, OM

Department of Accounting, Operations, and Information Systems  
Faculty of Business

### Graduate Courses

**OM 701 Introduction to Operations Management Research**

★3 (*fi 6*) (either term, 3-0-0). This course provides a general introduction to the major research fields of operations management (OM). The focus will be on reading and evaluating current papers from prominent OM journals. The theory of science and the review process will be briefly discussed. Students are expected to have as mathematical background the equivalent of an upper-level undergraduate or first-year graduate courses in optimization and probability or stochastic modeling. This course may be appropriate for some graduate students in engineering or computing science. Prerequisite: A graduate or undergraduate course in operations management. Open to all doctoral students or with the written permission of the instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

The most current Course Listing is available on Bear Tracks.

## 231.208 Ophthalmology, OPHTH

Department of Ophthalmology  
Faculty of Medicine and Dentistry

### Graduate Courses

**OPHTH 600 Seminar in Ophthalmology**

★6 (*fi 12*) (two term, 0-3s-0). Open to graduate students, particularly those in the Medical Sciences (Ophthalmology) program. Seminars are given by Residents in the Postgraduate Medical Education program in Ophthalmology. Tutorials are presented by staff or by visiting speakers. Topics covered include; pediatric ophthalmology/strabismus, contact lens/cornea/external eye disease, neuro-ophthalmology, orbit/oculoplastics, retina, principles of ocular surgery, glaucoma, ocular genetics. Specific topics will not be repeated more often than once each four years so that four consecutive enrolments are possible. Prerequisite: consent of Department.

**OPHTH 601 Ocular Genetics**

★3 (*fi 6*) (either term, 3-0-0). This course provides a comprehensive overview of various aspects of eye genetics including both basic science studies and clinical conditions. Clinical case studies and their investigation will form part of the course. Offered in alternate years. Format includes didactic lectures supplemented by brief student presentations and guest speakers. Grades are assigned according to participation and a final exam. Prerequisite: Familiarity with medical genetics and ophthalmology and the consent of the Department.

## 231.209 Oral Biology, OBIOL

Department of Dentistry  
Faculty of Medicine and Dentistry

### Undergraduate Courses

**OBIOL 202 Oral Biology I**

★4 (*fi 8*) (two term, 62 hours). Basic microscopic anatomy pertinent to the main body systems and a more detailed treatment of the structure and development of oral tissues, with special reference to the teeth and their supporting structures. Clinical examples and a demonstration lab will be used to enhance the teaching of basic anatomy.

**OBIOL 302 Oral Biology II**

★3 (*fi 6*) (first term, 45 hours). A multidisciplinary course that examines the unique physiology, biochemistry and nutrition of oral structures. Topics will include functions of the periodontal tissues, the temporomandibular joint, mastication, deglutition, speech, special reflexes involving cranial nerves, receptors of the stomatognathic system, and salivary glands and relevance of saliva to caries. Oral manifestations of metabolic disease, the physiology of pain, and the role of nutrition in the development of oral tissues and the maintenance of oral health will also be discussed.

**OBIOL 305 Pathology**

★3 (*fi 6*) (two term, 42 hours). Introduction to the principles of pathology with consideration of the more common diseases affecting the human body. Visual differentiation between normal and abnormal tissues; the physiological and pathological changes which affect the teeth, their supporting structures and the oral mucosa, including oral manifestations of selected systemic disturbances.

### Graduate Courses

**OBIOL 500 Oral Biology I**

★3 (*fi 6*) (first term, 3-0-0). Functional anatomy of head and neck, development, structure, function and biochemistry of connective tissues associated with the jaws and cell biology. Course offered in alternate years.

**OBIOL 501 Oral Biology II**

★3 (*fi 6*) (second term, 3-0-0). A continuation of Oral Biology I. Craniofacial development and selected topics in physiology. Course offered in alternate years.

**OBIOL 503 Advanced Oral Pathology**

★3 (*fi 6*) (first term, 3-0-0). A review of diseases that affect the oral tissues and an exploration of recently acquired knowledge pertaining to them.

**OBIOL 504 Oral Medicine**

★3 (*fi 6*) (second term, 3-0-0). A study of the mechanisms of oral disease as a basis for rationale of treatment.

**OBIOL 601 Seminars in Oral Biology**

★2 (*fi 4*) (two term, 0-1s-0). Seminars will focus on the major areas of research of Oral Biology staff and students. Students must present one seminar on topics related to their field of research. Required for all MSc and PhD students.

<https://www.beartracks.ualberta.ca>



**OBIOL 607 Conference Seminars in Oral Biology I**

★3 (*fi 6*) (first term, 0-3s-0). This course will include seminars and conferences on selected aspects of oral biology. Continuous evaluation of student preparation and participation throughout the course will be used for assessment. This is an optional course open to students outside the Faculty of Medicine and Dentistry by consent of the Chair, Department of Dentistry.

**OBIOL 608 Conference Seminars in Oral Biology II**

★3 (*fi 6*) (second term, 0-3s-0). This is a continuation of DENT 607.

**OBIOL 609 Connective Tissue Research**

★2 (*fi 4*) (two term, 0-1s-0). This course will critically survey recent research on connective tissues and will aim to provide students practice in communicating research data.

**OBIOL 900 Directed Research Project**

★6 (*fi 12*) (variable, unassigned).

**231.210 Organizational Analysis, ORG A**

Department of Strategic Management and Organization  
Faculty of Business

**Note:** Enrolment in all SMO courses is restricted to students registered in the Faculty of Business, or to students registered in specified programs that require Business courses to meet degree requirements and who have obtained prior approval of their Faculty.

**Graduate Courses****ORG A 701 Seminar in Organization Theory**

★3 (*fi 6*) (either term, 3-0-0). Introduces students to the major schools of thought in organization and management theory. Considers the development of the field, major and foundational works in these schools of thought, and provides a cognitive map with which to evaluate contemporary research and debates. At the end of the course the student will have an understanding of the strengths and weaknesses of each major perspective. Prerequisite: Registration in Business PhD Program or written permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

**ORG A 702 Seminar in Human Behavior in Organization**

★3 (*fi 6*) (either term, 3-0-0). Examines current and classic research on human behavior as it occurs within the boundaries of organizations. Reviews pertinent theories and research findings that relate to topics such as motivation, social influence process, organization roles, leadership, change and inter- and intra-group dynamics. Issues of job design, conflict resolution, communications processes and problem solving may also be covered. Prerequisite: Registration in Business PhD Program or written permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

**ORG A 703 Seminar in Strategic Management**

★3 (*fi 6*) (either term, 3-0-0). Examines the current state of knowledge in strategic management. Topics may include the sources of competitive advantage, the role of industry evolution and technology, the organization of top management, and managerial decision-making and cognition. Introduces students to alternative theoretical perspectives and available empirical evidence related to these topics. Prerequisite: Registration in Business PhD Program or written permission of instructor. Approval of the Business PhD Program Director is also required for non-PhD students.

**ORG A 704 Individual Research**

★3 (*fi 6*) (either term, 3-0-0).

**ORG A 705 Seminar in Contemporary Issues**

★3 (*fi 6*) (either term, 3-0-0). This course is designed to provide a holistic viewpoint on the life and work of a management professor. The target audience is those who are just beginning their doctoral program in the Organizational Analysis and Human Resources/Organizational Behavior/Industrial Relations areas. As students move through their doctoral program and into their first academic jobs, there are several skills and understandings that will be important for them to develop, with the ultimate goal of making their careers ones that are fulfilling. This course helps ground the students in a broad range of the basic skills they will build on over their careers. To that end, this course focuses on professional development, including research, teaching, presenting, and being a positive contributing member of the academe. Approval of the Business PhD Program Director is also required for non-PhD students.

**ORG A 707 Seminar in Special Organizational Topics**

★3 (*fi 6*) (either term, 3-0-0). Examines special domain-related topics currently popular within organizational research. Topics will vary from one seminar to the next depending on instructor expertise, student interest and advances within the field. Illustrative topics include (but are not limited to) entrepreneurship, family enterprise and technology commercialization. Prerequisite: Registration in Business PhD Program or written permission of instructor. Approval of the Business PhD Director is also required for non-PhD students.

**231.211 Paediatrics, PAED**

Department of Paediatrics  
Faculty of Medicine and Dentistry

**Undergraduate Courses****PAED 546 Paediatrics Student Internship**

★8 (*fi 16*) (either term, 8 weeks). Student internship in paediatrics for students registered in the MD program.

**Graduate Courses****PAED 500 Seminar Course in Paediatric Sciences**

★3 (*fi 6*) (either term, 1-0-6). A seminar course designed for study of current topics in Child Health Research, specific to the student's MSc or PhD Program in the Department of Paediatrics. Prerequisite or Corequisites: Normally restricted to graduate students in Paediatrics. Consent of the Department.

**PAED 567 Reading Course in Paediatric Sciences**

★3 (*fi 6*) (either term, 1-0-6). A reading course designed for in-depth, individual study of a specific topic on paediatric medicine related to the student's MSc or PhD Program in the Department of Paediatrics. Prerequisite or Co-requisites: Normally restricted to graduate students in Paediatrics. Consent of the Department required.

**PAED 600 Seminar Course in Paediatric Sciences**

★3 (*fi 6*) (either term, 1-0-6). A seminar course designed for study of current topics in Child Health Research, specific to the student's MSc or PhD Program in the Department of Paediatrics. Prerequisite or Corequisites: Normally restricted to graduate students in Paediatrics. Consent of the Department.

**231.212 Paleontology, PALEO**

Departments of Biological Sciences; and Earth and Atmospheric Sciences  
Faculty of Science

**Undergraduate Courses****PALEO 400 Paleontology Field School**

★3 (*fi 6*) (first term, 0-1s-6). Students will learn the techniques of collection, curation and analysis of fossils at major dinosaur sites in Western Canada. The field component of the course will take place during the summer at a field station off campus. Each student will complete assignments in the field and will prepare a written report for completion by the end of October based on data acquired and methods learned during the field component. Prerequisite: Consent of Department. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. [Faculty of Science]

**PALEO 412 Selected Topics in Paleontology**

★3 (*fi 6*) (variable, 3-0-0). Covers specialized topics of current interest to advanced undergraduates in Biological Sciences and Earth and Atmospheric Sciences. Consult the Paleontology advisor for details about current offerings. Prerequisite: Consent of Instructor. Credit for this course may be obtained more than once. [Faculty of Science]

**PALEO 414 Paleontology**

★3 (*fi 6*) (second term, 3-0-3). Morphology, paleoecology and evolution, with emphasis on both the theoretical aspects and practical techniques of paleontology. Concentration on invertebrate paleontology, but examples from vertebrate paleontology and paleobotany included. Prerequisite: EAS 230. [Faculty of Science]

**PALEO 418 Paleobiology of the Lower Vertebrates**

★3 (*fi 6*) (first term, 3-0-3). Paleontology, evolution and paleoecology of early vertebrates, fishes, and amphibians, with emphasis on osteology, systematics, major adaptive shifts and subsequent radiations. Prerequisites: ZOOL 325 and any 300 level EAS or Biological Sciences course. Not available to students with credit in PALEO 318. [Faculty of Science]

**PALEO 419 Paleobiology of the Higher Vertebrates**

★3 (*fi 6*) (second term, 3-0-3). Paleontology, evolution and paleoecology of Synapsida (e.g. therapsids and mammals) and Reptilia (e.g. snakes, lizards, dinosaurs, and birds) with emphasis on osteology, systematics, major adaptive shifts and subsequent radiations. Prerequisites: ZOOL 325 and any 300 level EAS or Biological Sciences course. Not available to students with credit in PALEO 319. [Faculty of Science]

**Graduate Courses**

**Note:** The following undergraduate courses may be taken for credit by graduate students: PALEO 418, 419.

**0 PALEO 512 Advanced Selected Topics in Paleontology**

★3 (fi 6) (variable, 3-0-0). Credit for this course may be obtained more than once. Classes concurrent with PALEO 412. [Faculty of Science]

**0 PALEO 513 Advanced Paleontology**

★3 (fi 6) (second term, 3-0-3). Morphology, paleoecology and evolution, with emphasis on both the theoretical aspects and practical techniques of paleontology. Concentration on invertebrate paleontology, but examples from vertebrate paleontology and paleobotany included. Classes concurrent with PALEO 414. Not available to students with credit in PALEO 414. [Faculty of Science]

**0 PALEO 520 Problems in Vertebrate Paleobiology**

★3 (fi 6) (either term, 0-3s-0). [Faculty of Science]

**231.213 Persian, PERS**

Department of Modern Languages and Cultural Studies  
Faculty of Arts

**Notes**

- (1) The Department reserves the right to place students in the language course appropriate to their level of language skill.
- (2) Placement tests may be administered in order to assess background. Students with a Persian language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in a more advanced course suitable to their level of ability. Students seeking to fulfill their Language Other than English requirement may begin at any one appropriate level, but must take the full ★6 in one language.
- (3) The Department will withhold credit from students completing courses for which background makes them ineligible. For example, 100-level courses are normally restricted to students with little or no knowledge in that language. Should students with matriculation standing or those possessing background (such as native speakers or those for whom it is their first language) register in the 100-level course, credit may be withheld.

**Undergraduate Courses****0 PERS 111 Beginners' Persian I**

★3 (fi 6) (either term, 5-0-0). Introduction to pronunciation, reading, writing and conversation. Note: not to be taken by students with native or near native proficiency, or Persian 35 or its equivalents in Canada and other countries. Not open to students with credit in PERS 100 or RELIG 299.

**0 PERS 112 Beginners' Persian II**

★3 (fi 6) (either term, 5-0-0). Continuation of PERS 111. Prerequisite: PERS 111 or consent of Department. Note: not to be taken by students with native or near native proficiency, or Persian 35 or its equivalents in Canada and other countries. Not open to students with credit in PERS 100 or RELIG 299.

**0 PERS 211 Intermediate Persian I**

★3 (fi 6) (either term, 4-0-0). Uses of Persian in various social contexts with illustrations drawn from films, classical and modern literature, including poetry. Prerequisite: PERS 112 or consent of Department. Note: not open to students with credit in PERS 301 or 302.

**0 PERS 212 Intermediate Persian II**

★3 (fi 6) (either term, 4-0-0). Continuation of PERS 211. Prerequisite: PERS 211 or consent of Department. Note: not open to students with credit in PERS 301 or 302.

**231.214 Petroleum Engineering, PET E**

School of Mining and Petroleum Engineering  
Department of Civil and Environmental Engineering  
Faculty of Engineering

**Note:** See also Materials Engineering (MATE); Mining (MIN E), and Petroleum Engineering (PET E) listings.

The following course was renumbered effective 2001-02:

Old	New
PET E 465	PET E 365

**Undergraduate Courses****PET E 275 Petroleum Reservoir Fluids**

★3.8 (fi 6) (either term, 3-0-3/2). Qualitative and quantitative phase behavior of petroleum reservoir fluids through the algebraic and numerical application of thermodynamic theory, equations of state, and empirical correlations. Determination of engineering PVT parameters. Oilfield waters. Introduction to mass transfer. Prerequisite: CHEM 105.

**PET E 362 Petroleum Reservoir Fluids**

★3.8 (fi 6) (first term, 3-0-3/2). Qualitative and quantitative phase behavior of

petroleum reservoir fluids through the algebraic and numerical application of thermodynamic theory, equations of state, and empirical correlations. Determination of engineering PVT parameters. Oilfield waters. Introduction to mass transfer. Prerequisite: CH E 243. Corequisite: CHEM 371.

**PET E 364 Oil Well Drilling and Completion**

★4.3 (fi 6) (either term, 3-1s-3/2). Elements of rock mechanics, drilling fluids, factors affecting rate of penetration, formulation evaluation and well completions, and field testing procedures of drilling fluids. Prerequisites: CIV E 270 and CH E 312.

**PET E 365 Well Logging and Formation Evaluation**

★3.5 (fi 6) (either term, 3-1s-0). Theory and engineering applications of measurements of physical properties of the formation near the well bore; interpretation and use of the information in reservoir engineering. Prerequisite: PET E 275.

**PET E 366 Petroleum Production Operations**

★3 (fi 6) (second term, 3-0-0). Land units in Western Canada, types and characteristics of well completions, perforating, wellbore damage and simulation, combined inflow and well performance analysis, multiphase flow through conduits, oil well pumping, gas lift, surface facilities and flow measurement, applied mass transfer. Prerequisite: CH E 312.

**PET E 367 Drilling Fluids Laboratory**

★1.8 (fi 6) (second term, 1-0-3/2). Functions and types of drilling fluids, drilling fluid properties and their control, equipment and test procedures used to determine drilling fluid properties, common drilling fluid additives, and drilling problems related to drilling fluids will be discussed. Laboratory experiments are designed to help students better understand the factors controlling drilling fluid properties as well as familiarize students with field testing procedures of drilling fluids.

**PET E 368 Fundamentals of Well Test Analysis**

★3.8 (fi 6) (second term, 3-0-3/2). A basic course in well test design and interpretation. Analysis methods for pressure drawdown, buildup, and interference tests. Principle of superposition and its application in well test analysis. Average reservoir pressure estimation. Effect of wellbore conditions on pressure behavior. An introduction to drill stem testing and gas well testing.

**PET E 373 Fundamental Reservoir Engineering**

★3.8 (fi 6) (either term, 3-0-3/2). Rock properties (porosity, permeability): definition, measurement and models. Rock-fluid interaction (wettability, relative permeability, interfacial tension, capillary pressure): definition, measurement and models. Single and multiphase flow through porous media Darcy equation and diffusivity equation: Derivation and solution for different coordinates and boundary conditions. Prerequisite: PET E 275. PET E 373 cannot be taken for credit if credit has already been obtained in PET E 473.

**PET E 444 Natural Gas Engineering**

★3 (fi 6) (either term, 3-0-0). Topics include gas properties, reserves estimation, gas well deliverability, gas well testing, gas storage, surface facilities, and transmission. Production of unconventional gas reservoirs (coal beds, hydrates, tight sand and shale gas). Prerequisite: PET E 275.

**PET E 470 Heavy Oil Recovery**

★3 (fi 6) (either term, 3-0-0). The objectives of this course are to introduce the student to the current heavy oil recovery technology, and to develop the practical project design techniques. Emphasis will be on thermal methods, although nonthermal methods will be covered briefly. This is designed to be suitable for both undergraduate and graduate students. Prerequisite or corequisite: PET E 473.

**PET E 471 Enhanced Oil Recovery**

★3 (fi 6) (either term, 3-0-0). Classification of EOR methods. 1-D, 2-D, and 3-D immiscible displacement performance estimation. Frontal advance theory and Buckley-Leverett-Welge approach. Chemical (polymer, surfactant, micellar injection) injection methods. Heavy oil recovery by thermal methods. Miscible-immiscible gas (hydrocarbon and CO<sub>2</sub>) injection. EOR in clastics and carbonates. Prerequisite: PET E 373.

**PET E 473 Fundamental Reservoir Engineering**

★3.8 (fi 6) (first term, 3-0-3/2). Rock properties, rock-fluid interaction, flow through porous media; material balance. Prerequisite: PET E 362 or consent of Instructor.

**PET E 475 Applied Reservoir Engineering**

★3.8 (fi 6) (either term, 3-0-3/2). Reserves estimation. Analysis and prediction of reservoir performance by use of material balance. Primary recovery performance for water influx and solution gas drive reservoirs. Decline curve analysis. Basics of well test analysis. Pressure drawdown and buildup tests. Average reservoir pressure estimation. Drill stem testing and gas well testing. Prerequisite: PET E 373.

**PET E 476 Well Completion and Stimulation**

★3 (fi 6) (either term, 3-0-0). A design course covering new developments in the area of well engineering. Will include construction, completion, and stimulation of oil/gas wells. Prerequisite: PET E 364.

**PET E 477 Modelling in Petroleum Engineering**

★3 (fi 6) (either term, 3-0-0). Basics of numerical reservoir simulation and numerical solution of partial differential equations. Simulation methods as applied to specific

problems in petroleum reservoir behavior. Applications on primary, secondary and tertiary recovery phases of petroleum production using commercial simulation packages. Prerequisites: PET E 373, ENCMP 100 and MATH 201 or equivalent.

#### **PET E 478 Thermal Methods in Heavy Oil Recovery**

★3 (*fi 6*) (either term, 3-0-0). A design course covering new developments in the area of heavy oil recovery. Will include modeling and designing heavy-oil recovery applications and thermal methods. Prerequisite: PET E 373.

#### **PET E 484 Oil and Gas Property Evaluation**

★3 (*fi 6*) (either term, 3-0-0). Principles of economic evaluation and risk analysis. Investment decision making. An economic and property evaluation in petroleum engineering involving exploration, drilling, production and development fundamentals and field case histories, Canadian oil and gas regulations, unitization and equalization of investment. Energy and oil prices. Prerequisite: ENG M 310 or 401 or equivalent.

#### **PET E 488 Petroleum Field Trip**

★0.5 (*fi 1*) (either term, 0-1s-0). Students in fifth and sixth terms of the traditional program, and students in the seventh and eighth terms of the co-op program, will be required to make several trips to selected field installations, laboratories and industrial plants.

#### **PET E 489 Petroleum Engineering Seminar**

★1 (*fi 2*) (second term, 1-0-0). Meetings of students and staff for discussion of topics related to petroleum engineering, including coverage of elements of ethics, equity, concepts of sustainable development and environmental stewardship, public and worker safety and health considerations including the context of the Alberta Occupational Health and Safety Act.

#### **PET E 496 Petroleum Engineering Design Project**

★4 (*fi 6*) (second term, 1-6s-0). Designed to deal with special case studies in the mining and petroleum industries; an analysis of reserves; the prediction of production and operating procedures related to the project; the application of economics in the analysis of profitability; economics and planning as tools for a management position. Prerequisite: PET E 484.

## Graduate Courses

#### **PET E 614 Well-Logging and Formation Evaluation**

★3.5 (*fi 6*) (either term, 3-1s-0). Petrophysics and modern well-logging methods; discussion of the physical properties of porous media and the measurement of geometric and mechanical properties of the porous media, fluid saturations, chemical composition of the saturating fluids; application of the results in formulation and reservoir evaluation.

#### **PET E 630 Petroleum Reservoir Engineering**

★3.5 (*fi 6*) (either term, 3-1s-0). Characteristics of reservoir materials (rock, reservoir fluids); reservoir evaluation (volumetric method, material balance method with water influx); fundamental production processes (primary recovery).

#### **PET E 632 Advanced Topics in Petroleum Production Mechanics**

★3.5 (*fi 6*) (either term, 3-1s-0). Concepts of reservoir engineering from an advanced point of view as applied to forecasting the performance of oil and/or gas reservoirs; combined driving mechanisms; applications to practical problems encountered during performance by primary means.

#### **PET E 634 Secondary Recovery**

★3.5 (*fi 6*) (either term, 3-1s-0). Evaluation and operation of secondary recovery projects; fundamental consideration of petroleum engineering and reservoir behavior applied to secondary recovery of oil; recent technical papers.

#### **PET E 635 Numerical and Analytical Solution of Porous Media Flow Problems**

★3.5 (*fi 6*) (either term, 3-1s-0). The goal of this course is to develop techniques for the solution of a wide variety of single phase flow problems in porous media for compressible and incompressible flow. Two dimensional flow will be considered for the greater part. Selected mathematical techniques, analytical as well as numerical, will be developed for specific problems. In a number of cases, analytical and numerical solutions will be compared.

#### **PET E 644 Fluid Mechanics of Natural Gas Production**

★3.5 (*fi 6*) (either term, 3-1s-0). Review of natural gas properties; reserve estimation techniques and advanced treatment of water influx in gas reservoirs; steady and transient single-phase gas flow in porous media; non-Darcy flow; deliverability tests; transient gas well testing; single and multiphase flow in circular conduits. Normally offered in alternate years.

#### **PET E 650 Reservoir Simulator Development**

★3.5 (*fi 6*) (either term, 3-1s-0). The principal objective of this course is the development of reservoir simulation theory to the level required for the construction of a three-phase, three-dimensional reservoir simulator. In addition to providing practice in developing a simulator, the course will also cover recent advances in simulation and history matching.

#### **PET E 664 Advanced Drilling Engineering**

★3.5 (*fi 6*) (either term, 3-1s-0). Recent advances and changes in drilling techniques

will be discussed. The topics will include directional drilling and deviation control, design aspects of horizontal and multilateral well drilling, measurement while drilling, drilling mechanics, bottomhole assembly design, tubular stability, drag and torque problems. Prerequisite: PET E 364 or consent of Instructor.

#### **PET E 668 Advanced Well Test Analysis**

★3.5 (*fi 6*) (either term, 3-1s-0). Analytical techniques employed to solve complex well test problems. Pressure derivative analysis. Production time effects on buildup analysis. Pressure transient analysis for fractured wells. Layered reservoir testing. Prerequisite: PET E 368 or consent of Instructor. Normally offered in alternate years.

#### **PET E 679 Thermal Recovery**

★3.5 (*fi 6*) (either term, 3-1s-0). Thermal recovery processes are mainly steam-based and can be divided into two main categories: displacement or drive processes and stimulation processes. Will cover steam displacement processes (steamflooding, steam-assisted gravity drainage), cyclic steam stimulation, in situ combustion, and briefly mention hot waterflooding. It will also cover properties of fluid and rock, wellbore heat losses, and a selection of thermal processes. Prerequisites: Permission of Instructor.

#### **PET E 686 Advanced Resource Economics and Risk Analysis**

★3 (*fi 6*) (either term, 3-0-0). An Advanced application of economic principles to natural resources project evaluation. Analysis of oil and gas prospects, its associated costs, expected profits and the risks involved. Exploration, drilling and production analysis including advanced evaluation techniques, risk analysis, decision trees, sensitivity analysis, capital allocation, Monte Carlo simulations, project analysis, portfolio management and Canadian regulations for the industry

#### **PET E 694 Advanced Topics in Petroleum Engineering**

★3.5 (*fi 6*) (either term, 3-1s-0). An advanced treatment of selected petroleum engineering topics of current interest to staff and students.

#### **PET E 709 Special Topics in Petroleum Engineering**

★3 (*fi 6*) (either term, 3-0-0). Reading Course. Reading and discussion of selected topics in Petroleum Engineering.

#### **PET E 900 Directed Research**

★3 (*fi 6*) (variable, unassigned). An engineering project for students registered in a Masters of Engineering program.

#### **PET E 910 Directed Research**

★6 (*fi 12*) (variable, unassigned). An engineering project for students registered in the joint MBA/MEng program.

## 231.215 Pharmacology, PMCOL

Department of Pharmacology  
Faculty of Medicine and Dentistry

## Undergraduate Courses

**Note:** The following courses may be used by students in the Faculty of Science as science courses: PMCOL 201, 202, 303, 305, 337, 343, 344, 371, 407, 412, 415 and 416, 424, 425, 442 and 498.

#### **0 PMCOL 201 Introductory Pharmacology**

★3 (*fi 6*) (either term, 3-0-0). An introduction to the discipline of pharmacology. What are drugs and how do they bring about their effects; how are drugs modified by the body; how are drugs developed and licensed for therapeutic use? These and related questions are addressed and the underlying pharmacological principles illustrated with examples drawn from an array of commonly used drugs. Prerequisites: CHEM 101 and 102, and either BIOL 107 or 108. Restricted to students in second year.

#### **PMCOL 202 Topics in Pharmacology**

★3 (*fi 6*) (second term, 3-0-0). This course is an extension of PMCOL 201. Lectures will examine in more detail the basic pharmacology of autonomic, cardiovascular, renal and gastrointestinal systems. Prerequisites: PMCOL 201. Corequisites: PHYSL 210, or PHYSL 212 and 214.

#### **PMCOL 300 Introduction to Pharmacology**

★2 (*fi 4*) (first term, 28 hours). Lectures are used to illustrate the principles of pharmacology including rational application of commonly used drugs to the treatment of disease. This course is available only to students registered in the Dental Hygiene Diploma program.

#### **PMCOL 303 Introduction to Toxicology**

★3 (*fi 6*) (either term, 3-0-0). The adverse effects of xenobiotics on biological systems are discussed. Principles of toxicology, including dose-response relationships and toxicant metabolism, are introduced. Responses of target organs to selected toxicants are described, with emphasis on molecular mechanisms; haloalkane and hydrocarbon solvents, heavy metals, carbon monoxide, cyanide, pesticides, pulmonary irritants, ethanol, and methanol serve as examples. Special topics include chemical carcinogenesis, teratogenesis, and the toxic effects of ionizing radiation, toxins, and food additives. Prerequisites or corequisites: BIOC 200, PHYSL 210, or 212 and 214, or consent of Department.



**PMCOL 305 An Introduction to the Pharmacology of Drug Abuse**

★3 (fi 6) (either term, 3-0-0). An introduction to the complexities of drug abuse and the drugs of abuse. The student will be introduced to the psychological and social problems of drug abuse and their impact upon the abuser. Objectives of the course are to develop an understanding of addiction and a detailed knowledge of the nature of the commonly abused substances. Emphasis will be placed upon the pharmacology of drugs of abuse. Prerequisite: a 200-level Biological Sciences course.

**PMCOL 337 Experimental Procedures in Pharmacology**

★3 (fi 6) (either term, 0-0-6). A laboratory course in which the use of biochemical techniques, as well as intact animal and isolated tissue preparations, as applied to pharmacological problems are emphasized. Course includes both a theoretical consideration of the procedures under study, together with practical instruction and practice in their execution. Normally restricted to Pharmacology Specialization or Honors programs. Prerequisite: PMCOL 343 and 344.

**PMCOL 343 Scientific Basis of Pharmacology: Part I**

★3 (fi 6) (first term, 3-0-0). This course, together with the subsequent PMCOL 344, provides a comprehensive study of the modern science of pharmacology. The objective of the course is to study how drugs act on physiological systems and how the responses to drugs may be quantified experimentally. The areas covered will include neuropharmacology, drugs used in treatment of diabetes and obesity, and gastrointestinal pharmacology. The course is not aimed at students in any professional program but, by providing context for the actions of drugs, information on the use of drugs for treatment of diseases will be provided. Prerequisite: PMCOL 201 and 202. Pre or corequisite: BIOCH 200 and PHYSL 210, or 212 and 214. In the case of over subscription, preference will be given to students in the Pharmacology Specialization or Honors Programs.

**PMCOL 344 Scientific Basis of Pharmacology: Part II**

★3 (fi 6) (second term, 3-0-0). A continuation of PMCOL 343 with an emphasis on immunopharmacology and chemotherapy of malignant and infectious diseases. Prerequisite: PMCOL 343.

**PMCOL 371 Cellular Neuroscience**

★3 (fi 6) (first term, 3-0-0). Lectures presented by the Faculty of Medicine and Dentistry and the Faculty of Science on nerve cell membranes, ion channels, neurotransmitters and their receptors, synaptic mechanisms and plasticity, gene regulation and development, the physiology of small neural networks and disorders involving basic mechanisms. Prerequisite: PHYSL 210, or 212 and 214, or 252, or ZOOL 242.

**PMCOL 401 Pharmacology Tutorial**

★3 (fi 6) (first term, 3-0-0). Research and/or Reading course. This course allows a student to study an area of pharmacology in much greater detail than is usual in most courses. The format is usually a reading/tutorial in which the student carries out directed reading and meets with the tutor at regular intervals for discussion and further guidance. Term papers are often used for evaluation purposes. A mature attitude towards learning is essential, as the course often requires independent study and research. Students who have a particular interest in any specific area of pharmacology are encouraged to meet with the faculty members to explore the possibilities of arranging a mutually satisfactory topic. Prerequisite: PMCOL 343 and 344.

**PMCOL 402 Pharmacology Tutorial**

★3 (fi 6) (second term, 3-0-0). Research and/or Reading course. This course allows a student to study an area of pharmacology in much greater detail than is usual in most courses. The format is usually a reading/tutorial in which the student carries out directed reading and meets with the tutor at regular intervals for discussion and further guidance. Term papers are often used for evaluation purposes. A mature attitude towards learning is essential, as the course often requires independent study and research. Students who have a particular interest in any specific area of pharmacology are encouraged to meet with faculty members to explore the possibilities of arranging a mutually satisfactory topic. Prerequisite: PMCOL 343 and 344.

**PMCOL 412 Drugs and the Nervous System**

★3 (fi 6) (either term, 3-0-0). Pharmacological management of disease in the central nervous system is presented in the context of current knowledge of neuroscience and neurochemistry. Prerequisite: PMCOL 343 and 344 or 371.

**PMCOL 415 Cardiovascular Pharmacology**

★3 (fi 6) (either term, 3-0-0). A lecture course that examines the pharmacology of drug action on the cardiovascular system. Topics include the molecular and cellular mechanisms involved in drug action on both the vasculature and the heart, the mechanisms involved in myocardial ischemic injury, and the control of heart inotropy and rhythmicity. Also provides an overview of current therapeutic options in the treatment of cardiovascular disease. Prerequisite: PMCOL 343 and 344.

**PMCOL 416 Current Topics in Endocrine Pharmacology**

★3 (fi 6) (either term, 3-0-0). This course examines in detail, drugs (including natural hormones) that are used for treatment of endocrine diseases (e.g. diabetes, infertility, and growth deficiency). The focus of the course is the action of drugs on hormone receptors and on the regulation of hormone synthesis and secretion. Prerequisite: PMCOL 343 and 344.

**PMCOL 424 Advanced Topics in Toxicology**

★3 (fi 6) (second term, 3-0-0). A discussion of selected topics of current interest in toxicology. Content may vary from year to year, but will generally include mechanisms of cell injury and cell death, mechanisms of chemical carcinogenesis, and topics from genetic toxicology, radiation toxicology, and forensic toxicology. Intended for senior undergraduate students. Prerequisites: PMCOL 303 and consent of Department.

**PMCOL 425 Problem Solving in Pharmacology and Therapeutics**

★3 (fi 6) (either term, 3-0-0). Students will be presented with problem cases involving patients with conditions, possibly needing drug therapy. They will identify the issues needing resolution, work collectively to find information to resolve them, and present these and their application to each patient to the group. The group will work to resolve outstanding issues after the presentations. Intended for senior undergraduate students. Prerequisites: PMCOL 343 and 344 and consent of Instructor.

**PMCOL 442 Pharmacological Characterization of Drugs**

★3 (fi 6) (first term, 3-0-0). This course will familiarize students in some detail with practical pharmacological concepts and approaches important during preclinical and early clinical drug development, both at the bench and in the clinic. Lectures cover the drug discovery process, advanced principles of ligand-receptor interactions, including how these interactions are observed and qualified in vitro and in vivo binding experiments, animal models of disease conditions used by the pharmaceutical industry, drug metabolism, basic principles of pharmacokinetics, and therapeutic drug monitoring. Prerequisite: PMCOL 343 and 344. Restricted to fourth year honors and specialization Pharmacology students.

**PMCOL 475 Signal Transduction Systems as Pharmacological Targets**

★3 (fi 6) (either term, 3-0-0). Regulation of various aspects of cell regulation, including proliferation, differentiation, metabolism, survival, motility, and gene transcription, occur mainly via protein phosphorylation in a complex array of well-organized signal transduction pathways. This course will cover topics related to the pharmacological investigation of cellular transduction systems, the discovery of small molecules that alter cell signaling, and how pharmacological manipulation of these signaling pathways may be useful in the drug treatment of a diverse range of diseases, including metastatic, cardiovascular, inflammatory, immune, metabolic and neurodegenerative diseases. Prerequisites: PMCOL 343 and 344.

**PMCOL 498 Pharmacology Research Program**

★6 (fi 12) (two term, 0-0-6). During their fourth year all honors candidates are required to carry out a program of directed research under the supervision of a staff member. This program will be related to the special interest of the student and will involve experimental work as well as two presentations and a written report on the part of the student. Students are encouraged to make arrangements with a supervisor of their choice before the fall term begins. Prerequisite: consent of Department. Normally available to fourth-year honors students only.

**Graduate Courses**

**Note:** Not all graduate courses are offered each year. The Chair of the Department should be consulted regarding the prerequisites for and availability of graduate courses in any academic session.

**PMCOL 501 Pharmacology Tutorial, Research, and Reading Course**

★3 (fi 6) (first term, 3-0-0). This course is similar to PMCOL 401 except that the course material and student performance will be at a level suitable for graduate students.

**PMCOL 502 Pharmacology Tutorial, Research, and Reading Course**

★3 (fi 6) (second term, 3-0-0). This course is similar to PMCOL 401 except that the course material and student performance will be at a level suitable for graduate students.

**PMCOL 504 Advanced Topics in Toxicology**

★3 (fi 6) (second term, 3-0-0). A discussion of selected topics of current interest in toxicology. Content may vary from year to year, but will generally include mechanisms of cell injury and cell death, mechanisms of chemical carcinogenesis, and topics from genetic toxicology, radiation toxicology, and forensic toxicology. Intended for graduate students. Prerequisites: PMCOL 303 and consent of Department.

**PMCOL 508 Molecular Pharmacology**

★3 (fi 6) (either term, 3-0-0). This course aims to provide an understanding of the general mechanisms of drug action at the molecular level. Theoretical aspects of drug-receptor interaction are presented in detail followed by a consideration of the mechanisms of signal transduction that have been associated with different receptor types. Prerequisite: consent of Department.

**PMCOL 510 Advanced Topics**

★3 (fi 6) (first term, 3-0-0).

**PMCOL 511 Advanced Topics**

★3 (fi 6) (second term, 3-0-0).

**PMCOL 512 Pharmacology of the Synapse**

★3 (fi 6) (either term, 3-0-0). Current concepts of neurotransmitters, neuromodulators and trophic factors are discussed in the context of the normal, diseased and

developing nervous systems. Students should have some biological background either in physiology, pharmacology, zoology, or the neurosciences. Prerequisite: consent of Department.

#### **PMCOL 514 Biophysical Aspects of Ion Channel Pharmacology**

★3 (fi 6) (either term, 3-0-0). A comprehensive examination of ion channels and their pharmacology. Topics to be covered include: molecular pharmacology, fundamental principles of bioelectricity, ion channel recording, analysis, classification, molecular biology, structure, pathophysiology and hereditary disease. Prerequisite: consent of the Department

#### **PMCOL 515 Advanced Topics in Cardiovascular Pharmacology**

★3 (fi 6) (either term, 3-0-0). Current concepts of cardiovascular pharmacology will be discussed in the context of the normal and diseased cardiovascular system. Recent developments and use of the literature will be emphasized. Prerequisites: PMCOL 415 and consent of Department.

#### **PMCOL 525 Problem Solving in Pharmacology and Therapeutics**

★3 (fi 6) (either term, 3-0-0). Students will be presented with problem cases involving patients with conditions, possibly needing drug therapy. They will identify the issues needing resolution, work collectively to find information to resolve them, and present these and their application to each patient to the group. The group will work to resolve outstanding issues after the presentations. Intended for graduate students. Prerequisites: PMCOL 343 and 344 and consent of Instructor.

#### **PMCOL 575 Signal Transduction Systems as Pharmacological Targets**

★3 (fi 6) (either term, 3-0-0). Regulation of various aspects of cell regulation, including proliferation, differentiation, metabolism, survival, motility, and gene transcription, occur mainly via protein phosphorylation in a complex array of well-organized signal transduction pathways. This course will cover topics related to the pharmacological investigation of cellular transduction systems, the discovery of small molecules that alter cell signaling, and how pharmacological manipulation of these signaling pathways may be useful in the drug treatment of a diverse range of diseases, including metastatic, cardiovascular, inflammatory, immune, metabolic and neurodegenerative diseases. Prerequisites: Consent of Department.

## 231.216 Pharmacy, PHARM

Faculty of Pharmacy and Pharmaceutical Sciences

### Undergraduate Courses

#### **PHARM 300 Experiential Learning - Part 1 - Service Learning**

★1 (fi 2) (two term, 60 hours). Part 1 of the experiential learning course is a structured experience in which students have the opportunity to adopt a patient-centred approach to care and develop a self-awareness of one's understanding of the patient's illness and needs. The practice experience is in conjunction with a structured volunteer program in an institution or with a patient care agency. (Restricted to Pharmacy students)

#### **PHARM 301 Principles of Drug Action and Disposition -Introduction to Medicinal Chemistry**

★2.5 (fi 5) (first term, 6-0-0 in 7 weeks). Introduction to medicinal chemistry, functional group recognition and properties, drug-receptor interactions, structure-activity relationships, rational drug design, and principles of drug absorption, distribution, metabolism and excretion. (Restricted to Pharmacy students).

#### **PHARM 304 Introduction to Core Skills Required of a Health Professional-Drug Information**

★0.5 (fi 1) (first term, 1-2S-2 in 7 weeks). Self-development of requisite of abilities for health professionals - Drug Information. (Restricted to Pharmacy students).

#### **PHARM 305 Experiential Learning-Part 2-Community**

★4 (fi 8) (Spring/Summer, 160 hours). This structured practical learning experience will allow students to integrate the knowledge and skills they have obtained in the classroom to the actual care of patients in community practice sites. Using the pharmaceutical care model and philosophy of practice, they will develop their patient interviewing skills, prepare and monitor pharmaceutical care plans, provide patient counseling on the administration of various dosage forms, answer drug information questions, participate in health promotion activities and begin to adopt the professional ethics, behaviours and attitudes of a pharmacist. Prerequisites: PHARM 300 (Restricted to Pharmacy students). Course is offered in Spring Term only.

#### **PHARM 306 Introductory Biomedical Science**

★2.5 (fi 5) (first term, 6-0-0 in 7 weeks). Introduces basic general concepts in the biomedical sciences, as a foundation for the systems blocks which follow in the undergraduate pharmacy curriculum. Integrates cell and tissue function in health and disease with basic principles of drug action and toxicity. (Restricted to Pharmacy students).

#### **PHARM 307 Dermatology, Eye, Ear, Nose and Throat**

★2.5 (fi 5) (second term, 7-2.5S-3 in 5 weeks). Anatomy, physiology, pathophysiology, pharmacology, medicinal chemistry, toxicology, pharmaceuticals, clinical pharmacokinetics, therapeutics and pharmacy practice relating to the

pharmacist's role in providing patient care for conditions relating to dermatology and eye, ear nose and throat disorders. (Restricted to Pharmacy students).

#### **PHARM 311 Radiopharm and Diagnostic Imaging**

★1 (fi 2) (first term, 3-0-3 in 5 weeks). A pharmacy-oriented introduction to radiopharmaceuticals and contemporary diagnostic imaging techniques. Emphasis is placed on basic radiological and radiopharmaceutical principles, instrumentation and clinical concepts. The advantages and limitations of various imaging modalities, including SPET, PET, MRI, x-ray CT and ultrasound are presented. (Restricted to Pharmacy students.)

#### **PHARM 314 Introduction of Core Skills Required of a Health Professional-Communications-Part I**

★1 (fi 2) (first term, 1-2S-3 in 8 weeks). Self-development of requisite values and abilities for health professionals. Topics covered include: abilities such as communication, self-directed learning, and group processes. (Restricted to Pharmacy students).

#### **PHARM 315 Experiential Learning - Part 3 Institutional**

★2 (fi 4) (Spring/Summer, 98 H in 2.5 weeks). This structured practical learning experience following second year will provide an orientation to institutional pharmacy practice and allow students to apply the knowledge and skills they have obtained in the classroom to the actual care of patients in institutional practice sites. (Restricted to Pharmacy students.)

#### **PHARM 321 Pharmacy Biotechnology and Immunology**

★2.5 (fi 5) (first term, 6-0-0 in 7 weeks). An introduction to molecular biology and immunology from a pharmaceutical perspective. The applications of genetic manipulations, immunological approaches, and biotechnological processes for the design of drugs based on nucleic acids and proteins will be discussed. Topics include basic principles, emerging methodologies, and examples of diagnostic and therapeutic applications. (Restricted to Pharmacy students).

#### **PHARM 322 Role of the Pharmacist in the Canadian Health Care System**

★2 (fi 4) (first term, 37 hours in 13 weeks). Designed to introduce the student to the profession of pharmacy and its position in the Canadian health care system. Topics covered include: History of Pharmacy, Introduction to the Canadian Health Care System, Roles of the Pharmacist, Concepts of Pharmaceutical Care, Health, Health Promotion, and Health Behaviours. (Restricted to Pharmacy students)

#### **PHARM 324 Introduction to Core Skills Required of a Health Professional-Evidence Based Medicine**

★1 (fi 2) (second term, 8-4S-0 in 5 weeks). Focuses on self-development of requisite abilities for health professionals. Topics covered include: critical appraisal of the literature. (Restricted to Pharmacy students).

#### **PHARM 327 Nutrition**

★2 (fi 4) (second term, 6-4S-0 in 5 weeks). Physiology, pathophysiology, pharmacology, medicinal chemistry, toxicology, pharmaceuticals, clinical pharmacokinetics, therapeutics and pharmacy practice relating to the pharmacist's role in providing patient care for conditions relating to nutrition. (Restricted to Pharmacy students.)

#### **PHARM 330 Comprehensive Assessment 1**

★3 (fi 6) (two term, variable). This lab course summarizes and provides integration of knowledge, skills and attitudes developed during the second year. A final comprehensive examination and clinical skills assessment examination are administered. (Restricted to Pharmacy students.)

#### **PHARM 331 Pharmaceutics 1**

★3 (fi 6) (second term, 6-1S-3 in 8 weeks). Principles of pharmaceutical dosage forms. Factors affecting the physical and chemical behavior of drug products. Rationale underlying the formulation and compounding techniques of pharmaceutical preparations. (Restricted to Pharmacy students)

#### **PHARM 334 Introduction to Core Skills Required of a Health Professional - Communications - Part 2**

★1.5 (fi 3) (second term, 3-2.5S-0 in 8 weeks). Self-development of requisite values and abilities for health professionals. Topics covered include: communications skills with an emphasis on interpersonal communication and time and stress management. (Restricted to Pharmacy students).

#### **PHARM 341 Pharmaceutical Analysis and Pharmacy Math**

★2 (fi 4) (first term, 6-0-0 in 6 weeks). An overview of the methods of pharmaceutical analyses used in the pharmaceutical sciences including pharmacy math. (Restricted to Pharmacy students).

#### **PHARM 342 Introduction to Drug Use Control Process and Patient Care**

★2.5 (fi 5) (second term, 3-2S-2 in 10 weeks). An introduction to the professional and technical aspects of drug use control, jurisprudence, drug information, and the provision of pharmaceutical care. Communication focuses on the development of basic interpersonal, rapport building, and patient counselling skills relating to the provision of various dosage forms. (Restricted to Pharmacy students).

#### **PHARM 347 Hematology**

★1 (fi 2) (first term, 3-2S-0 in 7 weeks). Anatomy, physiology, pathophysiology, pharmacology, medicinal chemistry, toxicology, pharmaceuticals, clinical

pharmacokinetics, therapeutics and pharmacy practice relating to the pharmacist's role in providing patient care for conditions relating to Hematology. (Restricted to Pharmacy students.)

#### **PHARM 351 Biopharmaceutics and Pharmacokinetics**

★2 (*fi 4*) (first term, 3-0-0 in 12 weeks). Application of biopharmaceutics and pharmacokinetics to patient care and drug therapy. (Restricted to Pharmacy students.)

#### **PHARM 357 Gastrointestinal**

★2 (*fi 4*) (first term, 5-4S-0 in 6 weeks). Anatomy, physiology, pathophysiology, pharmacology, medicinal chemistry, toxicology, pharmaceuticals, clinical pharmacokinetics, therapeutics and pharmacy practice relating to the pharmacist's role in providing patient care for conditions relating to the gastrointestinal tract and liver. (Restricted to Pharmacy students.)

#### **PHARM 361 Pharmaceutics 2**

★3 (*fi 6*) (first term, 6-6S-3 in 8 weeks). Physicochemical principles of pharmaceutical dosage forms. Factors affecting the physical and chemical behavior of drug products and dosage forms. Rationale underlying the formulation and quality control of pharmaceutical preparations. (Restricted to Pharmacy students.)

#### **PHARM 362 Pharmacy Laws and Ethics**

★1 (*fi 2*) (second term, 3-0-0 in 7 weeks). A study of the statutes governing the practice of Pharmacy, an understanding of the legal rights and responsibilities of the pharmacist and a practical application of these laws. Ethical theories and principles and their application in Pharmacy Practice. (Restricted to Pharmacy students.)

#### **PHARM 367 Cardiology**

★4 (*fi 8*) (second term, 5.5-8S-0 in 12 weeks). Anatomy, physiology, pathophysiology, pharmacology, medicinal chemistry, toxicology, pharmaceuticals, clinical pharmacokinetics, therapeutics and pharmacy practice relating to the pharmacist's role in providing patient care for conditions relating to cardiology. (Restricted to Pharmacy students.)

#### **PHARM 372 Pharmacy Management**

★2 (*fi 4*) (first term, 3-0-0 in 11 weeks). An introduction to the elements of pharmacy administration consisting of: management principles, and pharmacy practice management. Provides the student with an understanding of the economic, social, and professional environment of the profession of pharmacy. (Restricted to Pharmacy students.)

#### **PHARM 377 Immunotherapeutics and Transplant**

★1 (*fi 2*) (second term, 3-9S-0 in 5 weeks). Anatomy, physiology, pathophysiology, pharmacology, medicinal chemistry, toxicology, pharmaceuticals, clinical pharmacokinetics, therapeutics and pharmacy practice relating to the pharmacist's role in providing patient care for conditions relating to immunology and transplant. (Restricted to Pharmacy students.)

#### **PHARM 382 Provincial and Canadian Healthcare**

★3 (*fi 6*) (second term, 3-3S-0 in 12 weeks). An examination of healthcare and its issues from a pharmacy perspective within the context of the Canadian health care system. The course will provide a review of the health care; identify key problems, issues, and solutions in regards to delivering pharmacy services; review key stakeholders roles, responsibilities and relationships (current and future); and review issues relating to pharmacy as a profession and a business. (Restricted to pharmacy students.)

#### **PHARM 387 Pediatrics / Geriatrics**

★1.5 (*fi 3*) (second term, 3-3S-0 in 7 weeks). An integrated science and therapeutics-based course covering the relevant material relating to the physiology, pathophysiology, clinical toxicology, pharmacology, pharmacokinetics, therapeutics, complementary/alternative medicine and new or future advances in the treatment and management of age-related issues in special populations. (Restricted to Pharmacy students.)

#### **PHARM 392 Pharmacoepidemiology and Pharmacy Practice Research**

★1.5 (*fi 3*) (second term, 3-4S-0 in 9 weeks). An introduction to understanding the basic principles and concepts of pharmacoepidemiology and to research design relevant to pharmacy practice. (Restricted to Pharmacy students.)

#### **PHARM 397 Lab Values, Urology and Nephrology**

★2 (*fi 4*) (first term, 3-4S-0 in 12 weeks). Anatomy, physiology, pharmacology, medicinal chemistry, toxicology, pharmaceuticals and pharmacy practice relating to the pharmacist's role in providing patient care for conditions relating to lab values, fluids, electrolytes urology and nephrology. (Restricted to Pharmacy students.)

#### **PHARM 407 Infectious Diseases 1**

★4 (*fi 8*) (first term, 6-2s-2). Microbiology, pharmacology, medicinal chemistry, pathophysiology, toxicology, pharmaceuticals, clinical pharmacokinetics, therapeutics and pharmacy practice relating to the pharmacist's role in providing patient care for conditions relating to infectious diseases. (Restricted to Pharmacy students.)

#### **PHARM 417 Neurology**

★3 (*fi 6*) (first term, 7-3s-2 in 5 weeks). Anatomy, physiology, pathophysiology, pharmacology, medicinal chemistry, toxicology, pharmaceuticals, clinical pharmacokinetics, therapeutics and pharmacy practice relating to the pharmacist's

role in providing patient care for conditions relating to the central nervous system. (Restricted to Pharmacy students.)

#### **PHARM 425 Experiential Learning Part 4**

★16 (*fi 32*) (either term, 640 hours in 16 weeks). The student will be expected to demonstrate professional competencies in the provision of pharmaceutical care. Direct patient care activities will include drug therapy monitoring, patient interviewing, patient counseling, provision of drug information, and contributing to patient care as part of an interdisciplinary team. (Restricted to Pharmacy students.)

#### **PHARM 427 Pain**

★1.5 (*fi 3*) (second term, 3-4S-0 in 10 weeks). Anatomy, physiology, pathophysiology, pharmacology, medicinal chemistry, toxicology, pharmaceuticals, clinical pharmacokinetics, therapeutics and pharmacy practice relating to the pharmacist's role in providing patient care for conditions relating to non-malignant pain management. (Restricted to Pharmacy students.)

#### **PHARM 430 Comprehensive Assessment 2**

★0.5 (*fi 1*) (second term, 0-10s-2 in 1 week). This block summarizes and provides a final integration of knowledge, skills and attitudes developed during the third year. A final comprehensive examination and clinical skills assessment examination are administered. (Restricted to Pharmacy students.)

#### **PHARM 437 Bone and Joint**

★2 (*fi 4*) (second term, 7.5-3S-3 in 4 weeks). Anatomy, physiology, pathophysiology, pharmacology, medicinal chemistry, toxicology, pharmaceuticals, clinical pharmacokinetics, therapeutics and pharmacy practice relating to the pharmacist's role in providing patient care for conditions relating to bone and joint disorders. (Restricted to Pharmacy students.)

#### **PHARM 447 Psychiatry**

★2.5 (*fi 5*) (first term, 9-3S-3 in 4 weeks). Pathophysiology, pharmacology, medicinal chemistry, toxicology, pharmaceuticals, clinical pharmacokinetics, therapeutics and pharmacy practice relating to the pharmacist's role in providing patient care for psychiatric conditions. (Restricted to Pharmacy students.)

#### **PHARM 450 Special Topics in Pharmacy**

★1-6 (*variable*) (either term or Spring/Summer, variable). Consult the Faculty for the specific topics offered. Prerequisite: Consent of the Faculty.

#### **PHARM 455 Specialty Pharmacy Rotation**

★2-6 (*variable*) (either term or Spring/Summer, variable). Consists of 80-240 hours in a practice area, on a full-time or part-time basis. Students are required to prepare a proposal for the placement with desired objectives, activities and an evaluation mechanism. The proposal is to be agreed to by the Placement Coordinator and the Site Coordinator/preceptor. The placement will be conducted under the coordination of the Placement Coordinator and preceptor(s) at the practice site. The student is also required to prepare a report on the outcomes of the placement in the form of a portfolio. Travel and accommodation costs are the responsibility of the student. Prerequisites: Dependent on specialty and consent of Faculty. This course may be taken during the Spring/Summer Term by special arrangement. Credit may be obtained for this course more than once. Restricted to Pharmacy students.

#### **PHARM 467 Oncology**

★2.5 (*fi 5*) (first term, 6-2S-2 in 5 weeks). Basic science of oncology, anatomy, physiology, pathophysiology, pharmacology, medicinal chemistry, toxicology, pharmaceuticals, clinical pharmacokinetics, therapeutics and pharmacy practice relating to the pharmacist's role in providing patient care for conditions relating to cancer. (Restricted to Pharmacy students and to graduate students in Faculty of Pharmacy and Pharmaceutical Sciences.)

#### **PHARM 477 Infectious Diseases 2**

★4 (*fi 8*) (second term, 6-3S-3 in 13 weeks). Pharmacology, medicinal chemistry, pathophysiology, toxicology, pharmaceuticals, clinical pharmacokinetics, therapeutics and pharmacy practice relating to the pharmacist's role in providing patient care for conditions relating to infectious diseases. (Restricted to Pharmacy students.)

#### **PHARM 481 Veterinary Pharmacology**

★3 (*fi 6*) (either term, variable). A course in the commonly used veterinary biological and pharmaceutical preparations; general sanitary and management procedures for the prevention and control of livestock diseases; a brief review of infectious diseases and animal parasites.

#### **PHARM 487 Pulmonary**

★2 (*fi 4*) (either term, 6-6S-0 in 5 weeks). Anatomy, physiology, pathophysiology, pharmacology, medicinal chemistry, toxicology, pharmaceuticals, clinical pharmacokinetics, therapeutics and pharmacy practice relating to the pharmacist's role in providing patient care for conditions relating to the pulmonary system. (Restricted to Pharmacy students.)

#### **PHARM 489 Seminars in Therapeutics and Professional Practice**

★3-6 (*either term, variable*). A seminar course for fourth year pharmacy students covering selected topics in therapeutics, pharmacokinetics and clinical pharmacy. (Restricted to fourth year Pharmacy students.)



**PHARM 494 Pharmacy Management: Selected Topics**

★3 (*fi 6*) (either term, variable). Continuation of PHARM 372 with emphasis on financial management and the management of human resources. Projects on pharmacy operations. Prerequisite: PHARM 372.

**PHARM 497 Endocrine**

★2 (*fi 4*) (second term, 3-2S-3 in 11 weeks). Anatomy, physiology, pathophysiology, pharmacology, medicinal chemistry, toxicology, pharmaceuticals, clinical pharmacokinetics, therapeutics and pharmacy practice relating to the pharmacist's role in providing patient care for conditions relating to the endocrine system. (Restricted to Pharmacy students).

**PHARM 498 Research and Directed Studies**

★3 (*fi 6*) (either term, 0-0-4). Investigational work under the direction of a member of the Faculty. Preparation of a written report. Prerequisites: consent of the Faculty and the approval of a Faculty member to direct the research. This course may be taken during Spring/Summer by special arrangement. Credit may be obtained for this course more than once.

**PHARM 499 Women's and Men's Health**

★2 (*fi 4*) (second term, 6-3S-3 in 5 weeks). Anatomy, physiology, pathophysiology, pharmacology, medicinal chemistry, toxicology, pharmaceuticals, clinical pharmacokinetics, therapeutics and pharmacy practice relating to the pharmacist's role in providing patient care for conditions relating to women's and men's health. (Restricted to Pharmacy students).

**Graduate Courses**

**Note:** The following undergraduate courses may be taken for credit by graduate students: PHARM 481, 494.

**PHARM 564 Toxicology of Pharmaceutical Agents and Related Xenobiotics**

★3 (*fi 6*) (either term, 3-1s-0). Biochemical and molecular mechanisms of drug-induced damage. Key concepts include toxicological principles, toxicokinetics, toxic responses, bioactivation of drugs to toxic metabolites, organ directed toxicity, immunotoxicology, and receptor-mediated toxicity. Specialized topics include clinical and medical toxicology, forensic toxicology, pharmacoepidemiology related to drug toxicity, safety assessment of pharmaceutical agents, and environmental toxicology. Prerequisite: Consent of Faculty.

**PHARM 566 Cellular Aspects of Drug Delivery and Targets**

★3 (*fi 6*) (either term, 3-1s-0). The goals of this course are to discuss fundamental topics in cell and molecular biology and introduce students to important concepts in cellular structure and function as they relate to the design and development of novel drugs. Drug targets for macromolecules, including vaccines, proteins and genetic material will be emphasized. Prerequisite: Consent of Faculty.

**PHARM 570 Advanced Pharmaceutical Analysis - Spectroscopy**

★3 (*fi 6*) (first term, 3-0-3). Applications of instrumental methods of analysis (ultraviolet and infrared spectroscopy; NMR; mass spectrometry; atomic absorption spectroscopy) to pharmaceutical compounds. Offered in odd-numbered years. Prerequisite: Consent of Faculty.

**PHARM 573 Analytical Techniques in Pharmaceutical Sciences**

★3 (*fi 6*) (second term, 3-0-3). The course emphasizes the key skills required to study and explore recent trends in pharmaceutical analysis and the latest analytical technologies. The core analytical techniques such as chromatography, LC-MS, ELISA, and, electrophoresis will be discussed in detail along with hands-on experience during laboratory sessions. Prerequisite: PHARM 570 or consent of the Faculty. Offered alternate years.

**PHARM 580 Introduction to Computer-Aided Drug Design**

★3 (*fi 6*) (second term, 3-0-2). An introductory course designed to provide students with the background and a hands-on understanding of techniques involved in computer-aided drug design, including bioinformatics, molecular modelling, molecular simulation, docking and QSAR. Prerequisite: consent of the Faculty.

**PHARM 589 Pharmacy in Neoplastic Disease**

★3 (*fi 6*) (first term, 3-0-0). Description of neoplastic disease, its prevalence and drug treatment with an emphasis on patient management. There is an emphasis on the pharmacists' role in preparing chemotherapy medication, minimizing toxic effects of cancer drugs, dosage considerations, concomitant use of medication for other diseases and psychosocial aspects of care. Students will also learn about newer forms of treatments and changes in the provision of treatment services. Restricted to Pharmacy graduate students.

**PHARM 593 Advanced Radiopharmaceutical Sciences II**

★3 (*fi 6*) (first term, 3-0-4). Application of radionuclides in medical diagnosis and treatment; control of radionuclides in the hospital. Laboratory: preparation, quality control and clinical utility of currently used radiopharmaceuticals in nuclear medicine. Prerequisite: PHARM 601 or consent of Faculty.

**PHARM 595 Clinical Rotations**

★6 (*fi 12*) (two term, 900 hours). A clinical experience which will provide the student with the opportunity to practice clinical pharmacy in several speciality areas. The student will be expected to demonstrate professional competence in

patient counselling, obtaining medication histories, providing drug information, applied pharmacokinetics and related areas. Credit will be granted after the completion of 900 hours of approved clinical training.

**PHARM 596 Pharmaceutical Marketing**

★3 (*fi 6*) (first term, 3-0-0). An examination of the process of marketing pharmaceuticals in Canada. Topics to be covered are: pre-marketing requirements, regulatory control over drugs, price and product competition, promotion and advertising of pharmaceuticals, channels of distribution, packaging, ethics, price, and group purchasing. The course stresses the unique factors to be considered in marketing pharmaceuticals. Prerequisite: PHARM 372.

**PHARM 601 Isotope Tracer Methodology I**

★3 (*fi 6*) (first term, 3-0-3). Fundamental principles of radioactivity and health physics. The importance of radioisotopes in medicine, agriculture, industry, and research. Problems and limitations in the use of radioisotopes as tracers. Instrumentation and analysis methods. Experimental procedures, application of methods of analysis and criteria for evaluation of results. Laboratory: handling and preparation of radioisotopes for counting. Counting procedures. Tracer chemical and biochemical analyses.

**PHARM 603 Activation Analysis**

★3 (*fi 6*) (second term, 2-0-0). Physical and chemical basis of activation analysis, use of slow neutrons from the Slowpoke reactor, proton and charged particle activation; x-ray fluorescence; modern pulse-height analysis technique. Prerequisite: consent of Faculty. Note: Offered-alternate years.

**PHARM 604 Applied Problems in Current Research**

★3 (*fi 6*) (either term, 0-0-3). The student will work with one or two faculty members on special research techniques in bionucleonics or radiopharmacy. Prerequisite: consent of Faculty.

**PHARM 605 Radiopharmaceutical Chemistry**

★2 (*fi 4*) (second term, 2-0-0). A discussion of preparation of short-lived radiopharmaceuticals with emphasis on radiochemical synthesis using carbon-11, fluorine 18 and radionuclides of iodine and bromine; stability, storage and purity of radio-labelled compounds; labelling with long-lived radionuclides. Prerequisite: consent of Faculty. Note: Offered-alternate years.

**PHARM 606 Current Topics in Bionucleonics and Radiopharmacy**

★3 (*fi 6*) (either term, 3-0-0). Assigned readings, tutorials and seminars in recent advances in the fields of bionucleonics and radiopharmacy, conducted under the direction of several faculty members. Prerequisites: PHARM 601, 603, 604 or consent of Faculty.

**PHARM 610 Advanced Drug Delivery Systems**

★3 (*fi 6*) (first term, 3-0-0). The focus of this course is on the design and development of novel delivery systems for various treatment and diagnostic applications. A particular attention will be paid to the physicochemical principles behind the development of different drug delivery systems, their biological application and significance. Emphasis is given to polymer based systems and assembled nano-carriers for the delivery of therapeutic drugs, proteins, vaccines and genes. Prerequisite: Consent of Faculty.

**PHARM 611 Pharmaceutical Formulation and Development**

★3 (*fi 6*) (either term, 0-3s-2). Theoretical considerations basic to the technology of pharmaceutical dosage forms to meet the requirements of therapeutic efficacy, stability, and safety. Laboratory: development and formulation of pharmaceutical products. Prerequisite: consent of Faculty.

**PHARM 615 Advanced Pharmacokinetics**

★3 (*fi 6*) (second term, 3-0-0). This course deals with the theoretical aspects of pharmacokinetics. Compartmental and non-compartmental theories are treated in depth. The application of these theories is made in various areas where kinetics are involved. Prerequisite: PHARM 351 or equivalent or consent of Faculty. Note: Offered alternate years.

**PHARM 624 Application of Nuclear Magnetic Resonance Spectroscopy to Medicinal and Pharmaceutical Chemistry**

★3 (*fi 6*) (first term, 3-0-0). Basic interpretation and examples of use of NMR spectroscopy in problems of pharmaceutical synthesis and its studies of the mode of action of medicinally active compounds. Prerequisite: consent of Faculty. Note: Offered alternate years.

**PHARM 630 The Metabolism and Excretion of Drugs**

★3 (*fi 6*) (either term, 3-0-0). The chemistry, biochemistry and kinetics of drug metabolism together with the factors affecting metabolism; the practical aspects of *in vitro* and *in vivo* studies of drug metabolism; the excretion of drugs by various routes and factors affecting excretion, the kinetics of excretion. Note: Offered alternate years.

**PHARM 690 Advanced Seminar in Pharmacy and Pharmaceutical Sciences**

★3 (*fi 6*) (either term, 3-0-0). Assigned readings, tutorials, and seminars on recent advances and methodological approaches in Pharmacy, conducted under the direction of academic staff members in the Faculty of Pharmacy and Pharmaceutical Sciences.

**PHARM 694 Directed Project**

★3 (*fi 6*) (either term, 0-0-3). Directed studies in pharmaceutical research, using one or more techniques of special interest to individual students. Prerequisites: consent of the Faculty and the supervising faculty member.

**PHARM 697 Graduate Seminar**

★0 (*fi 1*) (two term, 0-1s-0). Seminar training and short seminar presentations on topics related to the student's field of research. Normally, the seminar will be presented during the student's second or third term. Required of all MSc and PhD students.

**PHARM 698 Graduate Seminar**

★0 (*fi 1*) (either term, 0-1s-0). Seminar presentation based on the student's research. Normally to be taken during the final term, prior to thesis defense. Required of all MSc and PhD students. Prerequisite: PHARM 697.

**PHARM 900 Directed Research Project**

★6 (*fi 12*) (variable, unassigned).

## 231.217 Philosophie, PHILE

Faculté Saint-Jean

### Cours de 1er cycle

**PHILE 125 Logique pratique**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Les procédés et les principes d'analyse des arguments. La matière du cours pourra inclure les sophismes informels, l'initiation à la méthode scientifique, le raisonnement statistique élémentaire, la logique propositionnelle élémentaire et les procédés susceptibles de mener à une décision rationnelle. Note: La priorité sera accordée aux étudiants du BA de la Faculté Saint-Jean.

**PHILE 140 Introduction à la philosophie occidentale**

★6 (*fi 12*) (aux deux semestres, 3-0-0). Introduction aux principaux problèmes et théories qui ont dominé la pensée philosophique en Occident, par l'étude et la discussion critique de quelques classiques de la philosophie. Les lectures incluront la République de Plato et les Méditations métaphysiques de Descartes et une oeuvre majeure de Hobbes, Locke, Berkeley ou Hume.

**PHILE 386 La bioéthique**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-0). Regard philosophique sur les problèmes majeurs de la bioéthique. Exemples: les droits et les devoirs du personnel hospitalier et du patient, l'euthanasie active et passive, le droit à la vie et l'avortement, la recherche et l'expérimentation en médecine humaine et animale, la manipulation génétique.

## 231.218 Philosophy, PHIL

Department of Philosophy  
Faculty of Arts

**Notes**

- (1) No junior course presupposes background in Philosophy. PHIL 101, 102, and 120 are recommended for all students intending to continue in Philosophy. Courses at the 200-level are intended to provide a foundation for further study in Philosophy.
- (2) There are no formal prerequisites for 200- or 300-level courses (except for PHIL 220). Entrance to 400-level courses requires ★6 of prior courses in PHIL, at least three of which must be at the 200-level.

### Undergraduate Courses

**PHIL 101 Introduction to Philosophy: Values and Society**

★3 (*fi 6*) (either term, 2-1s-0). An introduction to the classical problems of philosophy through study and critical discussion of selected philosophical classics and contemporary works. Emphasis will be placed on questions of moral and other values and on the nature of society and justice.

**PHIL 102 Introduction to Philosophy: Knowledge and Reality**

★3 (*fi 6*) (either term, 2-1s-0). An introduction to the classical problems of philosophy through study and critical discussion of selected philosophical classics and contemporary works. Emphasis will be placed on questions of the nature and extent of human knowledge and classic problems about the nature of reality and our place in it.

**PHIL 120 Symbolic Logic I**

★3 (*fi 6*) (either term, 3-0-0). A study of sentential logic, including translation, semantics, decision procedures and natural deduction followed by an introduction to predicate logic, concentrating on translation. Note: Not open to students with credit in PHIL 220.

**PHIL 125 Practical Logic**

★3 (*fi 6*) (either term, 3-0-0). Elementary methods and principles for analyzing

reasoning as it occurs in everyday contexts. Topics may include informal fallacies, introduction to scientific method, elementary statistical reasoning, elementary sentential logic, as well as the study of argument in contemporary debates about issues of social concern.

**PHIL 200 Metaphysics**

★3 (*fi 6*) (either term, 3-0-0). Basic questions concerning the nature of reality. Topics may include existence, materialism and idealism, freedom and determinism, appearance and reality, causality, identity, time and space, universals and particulars.

**PHIL 205 Philosophy of Mind**

★3 (*fi 6*) (either term, 3-0-0). Basic questions concerning the mind and our attempts to study it scientifically.

**PHIL 215 Epistemology**

★3 (*fi 6*) (either term, 3-0-0). A study of such central topics in the theory of knowledge as truth and rationality, skepticism and the limits of knowledge, relativism and the objectivity of knowledge, the role of perception, memory and reason as sources of knowledge.

**PHIL 217 Biology, Society, and Values**

★3 (*fi 6*) (either term, 3-0-0). The philosophical and social impact of historical and contemporary topics in the biological sciences.

**PHIL 220 Symbolic Logic II**

★3 (*fi 6*) (either term, 3-0-0). A brief review of sentential logic followed by an intensive study of predicate logic with identity. Topics include translation, semantics, decision procedures, natural deduction systems, mathematical induction. Other topics include: theories of definite descriptions, elementary modal logic, formal axiomatic systems. Prerequisite: PHIL 120 or consent of Department.

**PHIL 230 Greek Philosophy to Plato**

★3 (*fi 6*) (either term, 3-0-0). A survey of the thought of the ancient Greek world from its beginnings with the Pre-Socratics up to and including Plato.

**PHIL 240 Descartes to Hume**

★3 (*fi 6*) (either term, 3-0-0). A survey of Philosophy in the 17th- and 18th centuries. Philosophers studied will include Descartes, Leibniz, Spinoza, Locke, Berkeley, and Hume.

**PHIL 250 Ethics**

★3 (*fi 6*) (either term, 3-0-0). An examination of questions of right and wrong, good and evil, and reasons for action, through the study of ethical thought of authors such as Plato, Aristotle, Hobbes, Kant, and Mill.

**PHIL 265 Philosophy of Science**

★3 (*fi 6*) (either term, 3-0-0). An introduction to the central issues in contemporary philosophy of science. Topics may include theory evaluation, paradigm shifts and theory change, laws of nature, causation and explanation, the rationality of science and its social and historical setting.

**PHIL 270 Political Philosophy**

★3 (*fi 6*) (either term, 3-0-0). A survey of issues in contemporary political philosophy with attention to liberalism and communitarianism, sovereignty, feminism, entitlement and distribution, and global justice.

**PHIL 272 Feminist Philosophy**

★3 (*fi 6*) (either term, 3-0-0). An introduction to feminist issues in current philosophy. Note: Not open to students with credit in PHIL 332 or W ST 332.

**PHIL 280 Philosophy of Art**

★3 (*fi 6*) (either term, 3-0-0). An introduction to some of the traditional theories, such as the expressionist and the formalist theories, which investigate the nature and function of the arts. The nature of aesthetic experience will also be considered.

**PHIL 291 Existentialism**

★3 (*fi 6*) (either term, 3-0-0). An introduction to the background and main themes of existentialist philosophy. Authors such as Kierkegaard, Nietzsche, Heidegger, and Sartre are considered.

**PHIL 301 World Philosophies**

★3 (*fi 6*) (either term, 3-0-0). An introduction to one or more non-Western approaches to philosophy, such as Africana, Asian, or aboriginal traditions of thought. Attention will be given to the internal structure of particular philosophical theories, as well as to connections with and interactions among broader cultural traditions, values, and practices.

**PHIL 305 Philosophy of Psychology**

★3 (*fi 6*) (either term, 3-0-0). Central topics at the interface of philosophy and psychology. Prerequisite: PHIL 205, or two courses in Psychology, or consent of Department.

**PHIL 317 Philosophy of Biology**

★3 (*fi 6*) (either term, 3-0-0). Core topics at the interface of biology and philosophy.

**PHIL 325 Risk, Choice, and Rationality**

★3 (*fi 6*) (either term, 3-0-0). A study of the formal theory of rationality including probability and induction, and elementary decision theory, with attention to the paradoxes of choice.

**PHIL 333 Aristotle and Hellenistic Philosophy**

★3 (fi 6) (either term, 3-0-0). The thought of the ancient Greek world from Aristotle into the Hellenistic Period. Note: Not open to students with credit in PHIL 242.

**PHIL 343 Kant to Nietzsche**

★3 (fi 6) (either term, 3-0-0). A survey of the philosophy of Kant and the 19th century. Philosophers studied will include Kant, Hegel, Marx, the Utilitarians, and Nietzsche. Note: Not open to students with credit in PHIL 245.

**PHIL 345 Humans and Animals**

★3 (fi 6) (either term, 3-0-0). Philosophical approaches to the question of comparative human and animal cognition, emotion, awareness, and language. The course will also address the problem of animal rights vis-à-vis individual and institutional human interests.

**PHIL 355 Philosophy of the Environment**

★3 (fi 6) (either term, 3-0-0). Philosophical dimensions of issues raised by our relationship to the environment. Topics may include anthropocentrism versus biocentrism, the value of biodiversity, the aesthetic appreciation of nature, the relationship between environmental and economic values.

**PHIL 357 Philosophy of Religion**

★3 (fi 6) (either term, 3-0-0). General topics in the Philosophy of Religion, which may include the concept of 'religion,' the existence of God, meaning and intelligibility in religious language, religion and morality, implications of the social scientific study of religion.

**PHIL 365 Philosophy of Computing**

★3 (fi 6) (either term, 3-0-0). Emphasis on artificial intelligence, artificial life, and virtual reality. No previous familiarity with computing is necessary.

**PHIL 366 Computers and Culture**

★3 (fi 6) (either term, 3-0-0). A philosophical examination of moral and social issues arising from the computer revolution. Possible topics include hacking, internet culture, smart environments and cyborgs.

**PHIL 367 Introduction to Philosophy of Mathematics**

★3 (fi 6) (either term, 3-0-0). Overview of approaches to the foundations of mathematics and of philosophical issues concerning the nature of mathematical objects, mathematical theories and the special status of mathematics among the sciences and other areas of knowledge.

**PHIL 368 Equality and Social Justice**

★3 (fi 6) (either term, 3-0-0). A philosophical study of the notions of equality, privilege, and freedom. Readings from classical and contemporary texts on justice, equality, group identity and difference, oppression and liberation. Attention will be paid to areas of current controversy such as welfare policies, affirmative action, and the nature and implications of sexual, cultural, and ethnic identity.

**PHIL 372 Philosophy of Sexuality**

★3 (fi 6) (either term, 3-0-0). Ontological, epistemological, political and ethical issues arising through readings of classical and contemporary texts.

**PHIL 375 Science and Society**

★3 (fi 6) (either term, 3-0-0). A broadly based introduction to the intellectual, cultural, and social dimensions of science and their implications. Topics may include the impact of the Newtonian revolution, mechanism, materialism and Darwinism, and the nature of objectivity and rationality.

**PHIL 380 Philosophy of Criticism**

★3 (fi 6) (either term, 3-0-0). An introduction to the philosophical foundations of art criticism. Questions concerning the standards of interpretation and of evaluation of the arts will be given special attention.

**PHIL 381 Philosophy and Literature**

★3 (fi 6) (either term, 3-0-0). An introduction to the philosophical study of literature.

**PHIL 382 Philosophy of Law: Theoretical and Social Issues**

★3 (fi 6) (either term, 3-0-0).

**PHIL 384 Applied Ethics**

★3 (fi 6) (either term, 3-0-0). Moral theory applied to practical problems in areas such as business, war and peace, the environment, and human relations.

**PHIL 386 Philosophy and Health Care**

★3 (fi 6) (either term, 3-0-0). A philosophical examination of concepts and issues central to knowledge and practice of health care. Topics may include: rights and responsibilities of patients and health care personnel, passive and active euthanasia, abortion, research and experimentation, disclosure of diagnosis and risks, death and suffering.

**PHIL 388 Philosophy and Nursing I**

★1.5 (fi 3) (either term, 18 hours). Examining traditional applications of moral philosophy to issues in healthcare. Topics include professionalism, confidentiality, nurse-patient relationships, and principled approaches to bioethics. Note: Open only to students registered in the BScN-Collaborative program.

**PHIL 392 Topics in Recent Continental Philosophy**

★3 (fi 6) (either term, 3-0-0). An introduction to such movements in recent European

Philosophy as phenomenology, hermeneutics, critical theory, structuralism, and post structuralism. Prerequisite: PHIL 291 or consent of the Department.

**PHIL 396 Third-Year Honors Seminar**

★3 (fi 6) (either term, 0-3s-0). Note: For students in the third year of the Honors program.

**PHIL 398 Philosophy and Nursing II**

★1.5 (fi 3) (either term, 18 hours). Examining moral and social issues surrounding the goals of nursing and of health care, using traditional bioethics principles and complementary approaches (e.g. ethics of care, virtue ethics, etc.). Topics may include death and dying, allocation of scarce resources, issues in paediatric care, and global health. Note: Open only to students registered in the BScN Collaborative program and who have completed PHIL 388. Not available for credit to students who have completed PHIL 389.

**PHIL 400 Topics in Metaphysics**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 401 Topics in Epistemology**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 405 Topics in Philosophy of Mind**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 411 Philosophy of Space and Time**

★3 (fi 6) (either term, 3-0-0). Selected theories and problems concerning the nature of space and time. A strong background in philosophy, mathematics, or physical sciences is desirable. Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 412 Topics in Philosophy of Science**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 415 Topics in Philosophy of Biology**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of the Department.

**PHIL 417 Philosophy and Cognitive Science**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 420 Metalogic**

★3 (fi 6) (either term, 3-0-0). The theoretical study of formal systems of logic. Topics include formal axiomatic systems, formal syntax and semantics, soundness and completeness proofs for both sentential and predicate logic. Prerequisite: PHIL 220 or consent of Department.

**PHIL 421 Modal Logic**

★3 (fi 6) (either term, 3-0-0). Standard modal systems in sentential and predicate logic including possible world semantics and completeness proofs. Tense logic and epistemic logic may be considered. Prerequisite: PHIL 220 or consent of Department.

**PHIL 422 Topics in Advanced Symbolic Logic**

★3 (fi 6) (either term, 3-0-0). Prerequisite: PHIL 220 or consent of Department.

**PHIL 425 Topics in Rationality**

★3 (fi 6) (either term, 3-0-0). Prerequisite: PHIL 325, ECON 101, or consent of Department.

**PHIL 426 Philosophy of Language**

★3 (fi 6) (either term, 3-0-0). Selected problems concerning the nature of language and meaning. Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 428 Logic and Language**

★3 (fi 6) (either term, 3-0-0). Philosophical logic and its application to the semantics of natural language. Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 433 Topics in Feminist Philosophy**

★3 (fi 6) (either term, 3-0-0). Prerequisite: PHIL 272 or 332 (taken prior to 2006) or W ST 301 or consent of Department.

**PHIL 436 Topics in Medieval Philosophy**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200 level, or consent of Department.

**PHIL 440 Topics in Ancient Philosophy**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200 level, or consent of Department.

**PHIL 442 17th- and 18th-Century Continental Philosophy**

★3 (fi 6) (either term, 3-0-0). Topics concerning the early modern philosophical tradition of Descartes, Spinoza, and Leibniz. Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.



**PHIL 443 17th- and 18th-Century British Philosophy**

★3 (fi 6) (either term, 3-0-0). Topics concerning the early modern British philosophical tradition of Locke, Berkeley, and Hume. Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 444 Kant**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 445 Topics in 19th-Century Philosophy**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 446 Early Analytic Philosophy**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200 level, or consent of Department.

**PHIL 447 Wittgenstein**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 448 Topics in 20th-Century Philosophy**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 450 Topics in Ethics**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 451 Topics in the History of Moral and Political Philosophy**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 453 Philosophy of History**

★3 (fi 6) (either term, 3-0-0). Study of one or more of the following themes: Speculative accounts of our historical being and of the sense of history as a whole; critical analysis of the scope and limits of historiographic knowledge and explanation; historicist theses that philosophy is essentially historical. Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 470 Topics in Social and Political Philosophy**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 480 Topics in Aesthetics**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 481 Topics in Philosophy and Literature**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of the Department.

**PHIL 486 Directed Reading I**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**PHIL 487 Directed Reading II**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**PHIL 488 Current Research in Philosophy**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in PHIL, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 493 Fourth-Year Honors Seminar**

★3 (fi 6) (first term, 0-3s-0). Note: For students in the fourth year of the Honors program.

**PHIL 498 Honors Essay**

★3 (fi 6) (either term, 3-0-0). Preparation of the honors essay, required in the fourth year of the Honors program.

**231.218.1 Graduate Courses**

**Note:** Only a selection of the courses listed below are offered each year.

**PHIL 500 Metaphysics**

★3 (fi 6) (either term, 3-0-0).

**PHIL 501 Epistemology**

★3 (fi 6) (either term, 3-0-0).

**PHIL 505 Philosophy of Mind**

★3 (fi 6) (either term, 3-0-0).

**PHIL 510 Philosophy of Science**

★3 (fi 6) (either term, 3-0-0).

**PHIL 522 Topics in Logic**

★3 (fi 6) (either term, 3-0-0).

**PHIL 526 Philosophy of Language**

★3 (fi 6) (either term, 3-0-0).

**PHIL 536 Topics in Medieval Philosophy**

★3 (fi 6) (either term, 3-0-0).

**PHIL 540 Topics in Ancient Philosophy**

★3 (fi 6) (either term, 3-0-0).

**PHIL 546 Topics in Modern Philosophy**

★3 (fi 6) (either term, 3-0-0).

**PHIL 547 Topics in 20th Century Philosophy**

★3 (fi 6) (either term, 3-0-0).

**PHIL 550 Moral Philosophy**

★3 (fi 6) (either term, 3-0-0).

**PHIL 570 Social and Political Philosophy**

★3 (fi 6) (either term, 3-0-0).

**PHIL 580 Aesthetics**

★3 (fi 6) (either term, 3-0-0).

**PHIL 594 Selected Problems in Philosophy**

★3 (fi 6) (either term, 3-0-0).

**PHIL 596 Directed Reading I**

★3 (fi 6) (either term, 3-0-0). Prerequisite: Open only to graduate students beyond the qualifying year.

**PHIL 597 Directed Reading II**

★3 (fi 6) (either term, 3-0-0). Prerequisite: Open only to graduate students beyond the qualifying year.

**231.218.2 Philosophy (from within the Roman Catholic Tradition) St Joseph's College****O PHIL 209 The Human Person: Philosophical Issues**

★3 (fi 6) (either term, 3-0-0). Personal identity, interpersonal relationships, sex and gender, freedom and immortality in historical and contemporary contexts.

**O PHIL 239 Greek Philosophy and the Christian Tradition**

★3 (fi 6) (either term, 3-0-0). Issues concerning human beings, knowledge, ethics and society among Greek thinkers and their impact on Christian thought. Note: Not available for credit with PHIL 139.

**O PHIL 249 Medieval Philosophy and the Christian Tradition**

★3 (fi 6) (either term, 3-0-0). A survey of philosophy from the 5th to the 15th centuries; Philosophers from the Jewish, Islamic and Christian traditions.

**O PHIL 269 Moral Issues in a Christian Context**

★3 (fi 6) (either term, 3-0-0). Analysis and evaluation of selected moral and social issues.

**O PHIL 289 Issues in the Philosophy of Christian Education**

★3 (fi 6) (either term, 3-0-0). A philosophical study of the principles and aims of Christian education. Topics will include educating the whole person, religious beliefs and values, religious pluralism, tolerance, the Christian and Catholic educational tradition, separate schools.

**O PHIL 309 Augustine**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★3 in PHIL or consent of the College.

**O PHIL 319 Thomas Aquinas**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★3 in PHIL or consent of the College.

**O PHIL 329 Natural Philosophy and the Christian Tradition**

★3 (fi 6) (either term, 3-0-0). A critical study of physical reality, dealing with such concepts as nature, scientific knowledge, space, time, causality, biological life, and teleology, in traditional and contemporary contexts.

**O PHIL 339 Contemporary World Views and Christianity**

★3 (fi 6) (either term, 3-0-0). Critical study of Christianity in dialogue with such worldviews as atheism, agnosticism, naturalism, materialism, existentialism, feminism, liberalism, postmodernism.

**O PHIL 359 Topics in Christian Philosophy**

★3 (fi 6) (either term, 3-0-0).

**PHIL 379 Philosophy and Nursing I: Christian Perspectives**

★1.5 (fi 3) (either term, 18 hours). Examining traditional applications of moral philosophy to issues in healthcare from a Christian perspective. Topics may include professionalism, confidentiality, nurse-patient relationships, and principled approaches to bioethics. Note: Open only to students registered in the BScN-Collaborative program. Not available for credit to students who have completed PHIL 388.

**PHIL 389 Philosophy and Nursing II: Christian Perspectives**

★1.5 (fi 3) (either term, 18 hours). Examining moral and social issues surrounding the goals of nursing and of healthcare from a Christian perspective, using traditional bioethics principles and complementary approaches (e.g. ethics of care, virtue

ethics, etc.). Topics may include death and dying, allocation of scarce resources, issues in paediatric care, and global health issues. Note: Open only to students registered in the BScN-Collaborative program. Not available for credit to students who have completed PHIL 398.

**PHIL 399 Religious Existentialism**

★3 (*fi 6*) (either term, 3-0-0).

**PHIL 459 Advanced Topics in Christian Philosophy**

★3 (*fi 6*) (either term, 3-0-0).

**Note:** For Christian Theology courses offered by St Joseph's College, see Christian Theology (CHRTC), St Joseph's College (from within the Roman Catholic Tradition).

## 231.219 Physical Activity, PAC

Faculty of Physical Education and Recreation

Goal of PAC Level I:

- (1) Acquisition of basic skills required in the activity and an appreciation of how these skills are used in combination in performance situations.
- (2) Development of the specific theoretical knowledges associated with terminology, history, sociocultural context, rules and organizational aspects, basic strategies and tactics, technique, and other concepts relevant to the activity.

**Notes**

- (1) Students enrolled in courses offered by the Faculty of Physical Education and Recreation must take responsibility for ensuring that they are physically and medically fit to be taking such courses. If a student has a physical or medical condition that may compromise his/her participation in a course, it is the student's responsibility to so inform the instructor of that course. Students may contact the Faculty for further information on physical activity requirements and are encouraged to seek medical advice if necessary.
- (2) Students are expected to attend the first class of any activity course appropriately dressed for active participation.
- (3) These courses may require the payment of additional miscellaneous fees. See §22.2.3 for details.

## Undergraduate Courses

**PAC 101 Principles and Concepts of Physical Activity**

★3 (*fi 6*) (either term, 0-3L-0). An exploration of the principles and concepts that underlie the movement of individuals and groups in a variety of settings. As the focus of the course is on the development of conceptual understanding of movement, a wide range of activities and their contexts will be examined and experienced. Note: credit will be granted for only one of PAC 101 or PEDS 294.

**PAC 110 Aquatics**

★1.5 (*fi 3*) (either term, 0-3L-0). Development of proficiency in swimming and aquatic skills and the examination of theoretical aspects of aquatics. Prerequisite: Aquaquest Level 8, or RLSS Lifesaving II, or YMCA Level 3, or Red Cross Level Blue, or the ability to swim front and back crawl efficiently.

**PAC 111 Basketball**

★1.5 (*fi 3*) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in Basketball.

**PAC 112 Field Hockey**

★1.5 (*fi 3*) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in Field Hockey.

**PAC 113 Football**

★1.5 (*fi 3*) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in Football.

**PAC 114 Ice Hockey**

★1.5 (*fi 3*) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in Ice Hockey. Prerequisite: Average to above average skating ability. Note: Students must provide their own skates, sticks, hockey gloves, helmets, elbow pads and shin pads.

**PAC 117 Rugby**

★1.5 (*fi 3*) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in Rugby. Note: Mouth guards recommended.

**PAC 118 Soccer**

★1.5 (*fi 3*) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in Soccer.

**PAC 131 Badminton**

★1.5 (*fi 3*) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in basic Badminton strokes and strategies. Note: Students must provide their own racquets and shuttlecocks.

**PAC 133 Squash**

★1.5 (*fi 3*) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in basic Squash strokes and strategies. Note: Students must provide their own racquets, balls, and eye guards.

**PAC 135 Tennis**

★1.5 (*fi 3*) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in the basic Tennis strokes (forehand, backhand, serve, and volley) and strategies. Note: Students must provide their own racquets, balls, and non-marking Tennis shoes.

**PAC 137 Volleyball**

★1.5 (*fi 3*) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in Volleyball.

**PAC 145 Golf**

★1.5 (*fi 3*) (Spring/Summer, 0-3L-0). Acquisition of theoretical knowledge and personal skill in driving, chipping, pitching and putting. Note 1: Students are responsible for the purchase of golf balls at the practice range. Note 2: Students can rent equipment from the local golf course.

**PAC 154 Wrestling**

★1.5 (*fi 3*) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in takedowns and groundwork.

**PAC 156 Yoga for Beginners**

★1.5 (*fi 3*) (either term, 0-3L-0). This course is designed to introduce students to fundamental yoga postures while developing a basic appreciation of yoga theory as it pertains to health and wellness.

**PAC 160 Gymnastics**

★1.5 (*fi 3*) (either term, 0-3L-0). Acquisition of personal skill in the fundamental movements common to all forms of gymnastics.

**PAC 173 Athletics (Track and Field)**

★1.5 (*fi 3*) (first term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in sprinting, hurdling, cross country running, high jumping, long jumping, discus throwing, javelin throwing, and relays.

**PAC 174 Athletics (Track and Field)**

★1.5 (*fi 3*) (second term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in sprinting, hurdling, middle distance running, triple jumping, high jumping, pole vaulting, shot putting, hammer throwing, and relays.

**PAC 182 Indoor Wall Climbing**

★1.5 (*fi 3*) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in basic climbing techniques, rope management, and belays. Note: Equipment is available for rent from Urban Uprising.

**PAC 183 Introduction to Curling**

★1.5 (*fi 3*) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in Curling.

**PAC 197 Selected Topics in Physical Activity - Level I**

★1.5 (*fi 3*) (either term, 0-3L-0). Note: Topics may vary from year to year.

**PAC 199 Directed Studies**

★1.5 (*fi 3*) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in an individual or team activity. Prerequisite: Consent of Faculty. Note: Topics may vary from year to year.

**PAC 310 Analysis and Instruction of Aquatics**

★3 (*fi 6*) (either term, 0-3L-0). This course examines practical and theoretical aspects and techniques related to instructing swimming and aquatic skills. Certification at the Instructor's level is optional provided students meet some extracurricular requirements. Prerequisite: PAC 110 or RLSS Bronze Medallion or the equivalent in swimming skill.

**PAC 311 Analysis and Instruction of Basketball**

★3 (*fi 6*) (either term, 0-3L-0). The theory, practice, and teaching of the fundamental skills of Basketball. Prerequisite: PAC 111.

**PAC 313 Analysis and Instruction of Football**

★3 (*fi 6*) (either term, 0-3L-0). Development of individual skills as well as basic unit and team play. Coaching fundamentals and administrative skills are discussed. Prerequisite: PAC 113.

**PAC 314 Analysis and Instruction of Ice Hockey**

★3 (*fi 6*) (either term, 0-3L-0). The theory, practice, and teaching of fundamental team play. Emphasis will be on the development of concepts and strategies from which effective systems are created. Students must provide their own equipment: skates, stick, helmet, hockey gloves, elbow pads and shin pads. Prerequisite: PAC 114.

**PAC 318 Analysis and Instruction of Soccer**

★3 (*fi 6*) (either term, 0-3L-0). The theory, practice, and teaching of the fundamental skills of Soccer. Emphasis on skill acquisitions and analysis. Prerequisite: PAC 118.

**PAC 320 Structure and Strategy of Games**

★3 (*fi 6*) (either term, 0-3L-0). A study of similarities and differences in games

(sports) through an examination of their specific rules, skills and strategies. Class members will be exposed to experiences at the practical and theoretical levels in the categories of territory, target, field and court games. Prerequisite: One of PAC 101, PEDS 293 or 294.

### **PAC 325 The Study of Games for Children and Youth**

★3 (fi 6) (either term, 1-2s-0). An in-depth study of games played by children and youth in informal situations and in organized programs. Opportunities to observe and work with children and youth will be provided. Prerequisite: One of PAC 101, PEDS 293, 294 or 338.

### **PAC 331 Analysis and Instruction of Badminton**

★3 (fi 6) (either term, 0-3L-0). Theory and practice of the skills and strategies of Badminton. Note: Students must provide their own racquets and shuttlecocks. Prerequisite: PAC 131.

### **PAC 333 Analysis and Instruction of Squash**

★3 (fi 6) (either term, 0-3L-0). The theory, practice, and teaching of the skills and strategies of Squash. Note: Students must provide their own racquets, balls, and eye guards. Prerequisite: PAC 133.

### **PAC 335 Analysis and Instruction of Tennis**

★3 (fi 6) (either term, 0-3L-0). Theory and practice of the skills and strategies of Tennis. Note: Students must provide their own racquets, balls, and non-marking Tennis shoes. Prerequisite: PAC 135.

### **PAC 337 Analysis and Instruction of Volleyball**

★3 (fi 6) (either term, 0-3L-0). The theory, practice and teaching of the fundamental skills of Volleyball. Emphasis will be on volleyball skill instruction, advanced personal skill acquisition and fundamental team systems. Prerequisite: PAC 137.

### **PAC 345 Analysis and Instruction of Golf**

★3 (fi 6) (Spring/Summer, 0-3L-0). The theory, practice, and teaching of the fundamental skills of Golf. Note 1: Students are responsible for the purchase of golf balls at the practice range. Note 2: Students can rent equipment from the local golf course. Prerequisite: PAC 145.

### **PAC 354 Analysis and Instruction of Wrestling**

★3 (fi 6) (either term, 0-3L-0). Emphasis on wrestling takedown and groundwork techniques. Includes theory, history, officiating and coaching principles. Prerequisite: PAC 154.

### **PAC 355 The Theory and Practice of Yoga**

★3 (fi 6) (either term, 0-3L-0). Emphasis on philosophy, scientific basis and unique yoga approach to fitness and stress management along with practice of yoga asanas.

### **PAC 356 Yoga for Stress Management**

★3 (fi 6) (either term, 0-3L-0). The purpose of the course is to: a) develop an understanding of stress, its causes and its effects on the human body; b) to comprehend the principles of yoga practices and their application in managing stress; and c) to learn and practice specific yoga exercises for stress management.

### **PAC 360 Analysis and Instruction of Gymnastics**

★3 (fi 6) (either term, 0-3L-0). Provides theoretical and practical foundations common to recreational and competitive gymnastics. Prerequisite: PAC 160.

### **PAC 365 The Study of Gymnastics for Children and Youth**

★3 (fi 6) (either term, 1-2s-0). A study of a variety of gymnastic programs from the perspective of their potential to meet the needs of children and youth at various ages. Class members will be required to plan, present, and evaluate gymnastic activities for children and youth. Prerequisite: One of PAC 101, PEDS 293 or 294.

### **PAC 370 Analysis and Instruction of Track and Field Events**

★3 (fi 6) (either term, 0-3L-0). Sprinting, hurdles, long-jump, high jump, triple jump, pole vault, distance running, relays, shot, discus, hammer, javelin, and related strength training. Prerequisite: PAC 173 or PAC 174.

### **PAC 383 Analysis and Instruction of Curling**

★3 (fi 6) (either term, 0-3L-0). Designed to offer students advanced skill and theoretical development fundamental to safe and enjoyable competitive involvement in Curling as a player, coach, and official. Prerequisite: PAC 183.

### **PAC 397 Selected Topics in Physical Activity - Level II**

★3 (fi 6) (either term, 0-3L-0). Note: Topics may vary from year to year.

### **PAC 399 Directed Studies**

★3 (fi 6) (either term, 3-0-0). The theory, practice and teaching of the fundamental skills of an individual or team activity. Prerequisite: Consent of Faculty. Note: Topics may vary from year to year.

### **PAC 490 Applied Resistance Training**

★3 (fi 6) (either term, 0-3L-0). The scientific examination of resistance training as an applied training methodology for general conditioning and sport-specific enhancement. Emphasis on resistance training techniques, lifting mechanics, program design and implementation will be the core element. Supplementary topics include plyometric training, Olympic lifts, and selected population program modifications. Prerequisite: PEDS 335.

### **PAC 491 Applied Endurance Training**

★3 (fi 6) (either term, 0-3L-0). An examination of the theoretical and practical aspects of both aerobic and anaerobic endurance training for general conditioning and sport. Topics include: the physiological limitations to endurance exercise; the assessment of endurance capacities; and the development and monitoring of endurance training programs. Prerequisite: PEDS 335.

## **231.220 Physical Education and Sport, PEDS**

Faculty of Physical Education and Recreation

### **Undergraduate Courses**

**Note:** Enrolment in all PEDS courses is restricted to students registered in the Faculty of Physical Education and Recreation, or to students registered in specified programs that require PEDS courses to meet degree requirements. Other students must obtain prior approval of the Faculty.

#### **PEDS 100 Structural Anatomy**

★3 (fi 6) (either term, 3-0-2). Introductory study of human anatomy. Students learn structural and functional components of selected systems of the human body.

#### **PEDS 101 Introduction to Human Physiology**

★3 (fi 6) (either term, 3-0-0). An introduction to human physiology from the cellular to systemic level with special emphasis on systems that adapt to exercise stress. Note: Credit will be granted for only one of PEDS 101 or 102.

#### **PEDS 103 Integrative Human Physiology**

★3 (fi 6) (second term, 3-0-0). Introduction to Integrative Human Physiology. Focuses on the regulation, control, and integration of cellular functions in the human body with special emphasis on systems that respond to exercise stress. Prerequisite: PEDS 101. Note credit will be granted for only one of PEDS 102 or 103.

#### **PEDS 200 Physiology of Exercise**

★3 (fi 6) (either term, 3-0-2). An introduction to physiological adaptations to stress of exercise and training. Prerequisite: PEDS 101.

#### **PEDS 203 Skill Acquisition and Performance**

★3 (fi 6) (either term, 3-0-0). The course presents a psychological approach to understanding human motor behavior. The course examines the processes involved in learning motor skills and controlling movement, and the factors that influence acquisition and performance.

#### **PEDS 205 Introduction to Outdoor Environmental Education**

★3 (fi 6) (either term, 0-4L-0). A conceptual and experiential introduction to outdoor environmental education and leadership. In addition to weekly lecture and lab components, the course includes weekend commitments. Note: Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **PEDS 206 Biomechanics**

★3 (fi 6) (either term, 3-0-0). A systematic procedure for qualitative analysis of human motion is presented. Students proceed from the identification of mechanical principles governing motion through to the formation of deterministic models and observational strategies. A weekly one-hour optional tutorial session will be scheduled.

#### **PEDS 240 Introduction to Sports Injuries**

★3 (fi 6) (either term, 3-0-2). Analysis of practical and theoretical concepts of sports injury. Includes an overview of sports medicine, care and prevention of injuries, and safety in athletics and physical education. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisite: PEDS 100.

#### **PEDS 245 Introduction to the Profession of Coaching**

★3 (fi 6) (either term, 3-0-0). Examines the principles of coaching as they relate to the development of the athlete, the role of the coach, and organization of sport in contemporary society. Designed to present basic coaching theory that is applicable to a variety of sport settings with the focus on the practice and the season. Note: Credit will only be granted for one of PEDS 245 or 345

#### **PEDS 246 Coaching Practicum I**

★3 (fi 6) (variable, variable). Students will be required to coach for a complete season in a program approved by the student's Mentor Coach. The purpose of the practicum is to provide the student with a practical coaching experience under the guidance of a Program Coach. It is intended to introduce the student to the demands of the profession of coaching. Note: at least 100 hours of outside-classroom time is required. Corequisite: PEDS 245 or 345.

#### **PEDS 293 Introduction to the Movement Activities of Children**

★3 (fi 6) (either term, 1.5-0-2). A study of developmentally appropriate movement activities for children. Students will participate and work with children in a variety of physical activities in recreational, educational and sport environments.



**PEDS 294 A Conceptual Approach to Physical Activity**

★3 (fi 6) (either term, 0-3L-0). A study of the fundamental movement concepts that underlie the physical activities engaged in by youth of secondary school age. Note: Credit will be granted for only one of PAC 101 or PEDS 294.

**PEDS 302 Human Motor Control**

★3 (fi 6) (either term, 3-0-2). Presents a multi-level approach that focuses on the neural and behavioral foundations underlying the control of movement. Prerequisite: PEDS 103.

**PEDS 303 Psychology of Sport and Physical Activity**

★3 (fi 6) (either term, 3-0-0). This course introduces the student to select psychological theory as it relates to sport and physical activity. Psychological constructs along with their theoretical perspectives will be viewed within a cognitive, emotional, and behavioral framework. An analytical approach is encouraged.

**PEDS 306 Quantitative Biomechanics of Physical Activity**

★3 (fi 6) (either term, 3-0-2). Further application of the principles of mechanics to understanding, analyzing, and measuring human movement. Topics include linear and angular kinematics and kinetics, photo instrumentation, body segment parameters, the link segment model and work-energy relationships. Prerequisite: PEDS 206.

**PEDS 307 Physical Growth and Psychomotor Development**

★3 (fi 6) (either term, 3-0-0). A study of the sequential changes in physical growth and motor development with emphasis on individual differences.

**PEDS 309 Statistics, Measurement, and Evaluation**

★3 (fi 6) (either term, 3-0-0). Descriptive and inferential statistics, classical true-score reliability theory, validity, and evaluation. Emphasis on practical application of tests and measurement related to a variety of sport, community and institutional settings. Note: Students cannot receive credit for PEDS 309 if they received credit for PSYCO 211, SOC 210, STAT 141 or STAT 151.

**PEDS 334 Body Composition, Nutrition and Physical Activity**

★3 (fi 6) (either term, 3-0-0). Emphasis on assessment and evaluation of body composition. Other topics include the regulation of body composition, nutritional requirements for athletes, eating disorders, and obesity. Prerequisite: PEDS 200 (no concurrent registration).

**PEDS 335 Advanced Conditioning Methodology**

★3 (fi 6) (either term, 3-0-0). A survey of the theoretical bases of conditioning programs. The course emphasis is on the nature of physiological adaptation to selected training regimens and the factors which influence the adaptive process. Prerequisite: PEDS 200 (no concurrent registration).

**PEDS 338 Physical Activity and Sport for Children**

★3 (fi 6) (either term, 0-3s-0). This course focuses on the child from birth to twelve years of age in a wide range of physical activities in both free and structured environments. It will look at activities offered in home, recreational, educational and competitive environments. There will be emphasis on the developing capabilities of the child and the most appropriate types of activity for any age or stage of development.

**PEDS 345 Introduction to Coaching**

★3 (fi 6) (either term, 3-0-0). This course introduces the student to a variety of coaching topics of both a theoretical and a practical nature, from a pedagogical perspective. Note: credit will be granted for only one of PEDS 245 or 345.

**PEDS 346 Coaching Practicum II**

★3 (fi 6) (variable, variable). Students will be required to coach for a complete season, preferably with High Performance athletes, in a program approved by the student's Mentor Coach. The student should expect to assume more responsibility than in PEDS 246, either in program or athlete development. The guidance of a highly qualified Head Coach is essential. It is intended to introduce the student to the demands of coaching in a High Performance-oriented program. Note: at least 150 hours of outside-classroom time is required. Prerequisite: PEDS 246.

**PEDS 385 Physical Activity and the Aging Adult**

★3 (fi 6) (either term, 3-0-0). An examination of the role of physical activity on the health and lifestyle of aging adults. Note: PEDS 385 was formerly PEDS 484. Credit will only be granted for one of these courses.

**PEDS 391 Introduction to the Scientific Basis of Human Movement**

★3 (fi 6) (either term, 3-0-0). Lecture course with an emphasis on introductory knowledge and practical implications of the structural and functional characteristics and capacities of the human body with respect to movement. Note: Degree Credit is not available for BPE, BPE/BED, or BSc-KIN students.

**PEDS 400 Human Gross Anatomy**

★3 (fi 6) (either term, 3-0-3). The course is designed to provide in-depth information on the structure of the human body. Lectures and laboratories emphasize the anatomical relationship in the extremities and the trunk as they relate to human movement, athletic therapy, and fitness. Lectures are followed by dissections of the human body and prosection demonstrations. Prerequisite: PEDS 100.

**PEDS 401 Applied Ethics in Physical Education and Sport**

★3 (fi 6) (either term, 2-1s-0). A philosophical examination of ethical questions

in the professional practice of physical education and sport. Prerequisite: PERLS 204. Note: This course was formerly PEDS 201. Credit will be granted for only one of these courses.

**PEDS 402 Human Factors and Ergonomics**

★3 (fi 6) (either term, 3-0-0). The abilities and limitations of human performance are examined with respect to how we interact with tasks and objects in our environment. Work systems will be analyzed and evaluated in terms of the capabilities and limitations of human participants. This approach can be taken from a number of different and interrelated perspectives such as biomechanics, motor behaviour, motor control, and physiology. Prerequisites: PEDS 203 and 206.

**PEDS 403 The Application of Psychological Skills to Sport and Physical Activity**

★3 (fi 6) (either term, 3-0-0). The direct application of select psychological skills to sport and physical activity. A strong emphasis is placed on how to apply psychological skills in a variety of settings. Prerequisite: PEDS 303.

**PEDS 409 Introduction to Research**

★3 (fi 6) (either term, 3-0-0). An overview of research in physical education with emphasis on practical application of research techniques and designs. This course is intended for students who possess a minimal knowledge of statistics. Prerequisite: PEDS 309; or STAT 141 or 151.

**PEDS 411 Physiology of Emergency Response Occupations**

★3 (fi 6) (either term, 3-0-2). Explores selected issues of work physiology related to emergency response occupations with the main emphasis on fire fighting. Topics will include: human rights legislation and policies related to bona fide occupational requirements; the assessment of workload; the physiological limitations to work capacity; the development and implementation of physical fitness testing programs for applicants and incumbents; and, the development and monitoring of fitness training programs related to work demands. Prerequisite: PEDS 335.

**PEDS 412 Selected Topics in Advanced Exercise Physiology**

★3 (fi 6) (either term, 3-0-0). Covers the acute and chronic response to exercise through an increased understanding of the mechanisms and adaptations that occur within the human body. Invited guest speakers will present topics of current interest that may include different sport modalities, different populations or different disease states to assist in the exploration of the field of exercise science. Prerequisites: PEDS 200 and 409.

**PEDS 430 Dimensions of Physical Activity Performance**

★3 (fi 6) (either term, 3-0-0). This course explores the integrated nature of physical activity performance with emphasis on the biological, psychological, technical, and tactical dimensions. Skills in observation, interviewing, intervention, program development, and evaluation will be examined and developed through problem solving techniques. Prerequisite: PEDS 200, 203, 206, and 303. Recommended: PEDS 240, 245/345, 302, 335, and 403.

**PEDS 440 Advanced Athletic Therapy Methods and Techniques**

★3 (fi 6) (either term, 3-0-0). Recognition of the potentially serious injury. Advanced prevention, treatment, and sport-specific rehabilitative methods and techniques in athletic therapy. Prerequisites: PEDS 100 and PEDS 240.

**PEDS 444 Communication Skills and Strategies in Sport and Physical Activity**

★3 (fi 6) (either term, 1.5-1.5s-0). Through experiential learning activities, students will develop communication skills that will enhance their effectiveness as professionals in sport and physical activity settings. Students will explore distinctions of communication and conversations in a workshop format. Sample topics include self-awareness, listening, and interpersonal communication.

**PEDS 446 Coaching Practicum III**

★6 (fi 12) (variable, variable). Students will be required to coach for a complete season, preferably as a Head Coach, in a program approved by the student's Mentor Coach. The purpose of this practicum is to provide the students with the practical coaching experience of running their own program for one complete season. It is intended to familiarize the students with the demands of being a Head Coach. Note: at least 250 hours of outside-classroom time is required. Prerequisite: PEDS 346.

**PEDS 447 Advanced Topics in Coaching**

★3 (fi 6) (either term, 3-0-0). Study of advanced topics in coaching as they relate to the development of the athlete, the coach, and the organization of sport in contemporary society. Designed to present coaching theory that will guide rising coaches in the development of sport programs that will positively contribute to Canadian society and its sport development model. Prerequisites: PEDS 245 and 246, or Consent of Instructor.

**PEDS 471 Active Living for Individuals with Developmental Disabilities**

★3 (fi 6) (either term, 2-0-2). An in-depth review of characteristics of children with movement difficulties as well as persons with mental deficiency with implications for program planning and service delivery. Prerequisite: PERLS 207.

**PEDS 472 Active Living for Individuals with Physical Disabilities**

★3 (fi 6) (either term, 2-0-2). An in-depth review of characteristics of persons with physical disabilities with implications for program planning and service delivery. Prerequisites: PERLS 207.

**PEDS 490 Professional Practicum**

★6 (*fi 12*) (variable, variable). A half-time Professional Practicum that may run for a single term for 20 hours per week, two terms for 10 hours per week, or the equivalent time. Students must apply to the Practicum Supervisor. A limited number of placements are available. Note: Students will not be allowed to register in more than ★9 concurrently with PEDS 490 unless approved by the Practicum Supervisor.

**PEDS 491 Professional Practicum**

★12 (*fi 24*) (variable, variable). Fourteen weeks of professional experience in a full-time (approximately 35 - 40 hours per week) route-related placement. Students must apply to the Practicum Supervisor. A limited number of placements are available. Note: Students will not be allowed to register in any other course in conjunction with PEDS 491 unless approved by the Practicum Supervisor.

**PEDS 497 Selected Topics in Physical Education and Sport**

★3 (*fi 6*) (either term, variable). A course offered on a topic of current interest in physical education and sport. Topics may vary from year to year. Prerequisite: consent of Faculty.

**PEDS 499 Directed Studies**

★3 (*fi 6*) (either term, variable). A course designed to meet the needs of individual students. Prerequisite: consent of Faculty.

**Graduate Courses****PEDS 500 Seminar in Biomechanics**

★3 (*fi 6*) (either term, 0-3s-0).

**PEDS 511 Exercise Testing and Exercise Prescription**

★3 (*fi 6*) (either term, 1-1s-2). The theory and practice of exercise tests, interpretation, and exercise prescription for selected populations.

**PEDS 512 Selected Topics in Advanced Exercise Physiology**

★3 (*fi 6*) (either term, 3-0-0). Covers the acute and chronic response to exercise through an increased understanding of the mechanisms and adaptations that occur within the human body. Invited guest speakers will present topics of current interest that may include different sport modalities, different populations or different disease states to assist in the exploration of the field of exercise science. Lectures are the same as for PEDS 412, but with additional assignments and evaluation appropriate to graduate studies. This course may not be taken for credit if credit has already been obtained in PEDS 412. Prerequisites: Consent of Faculty.

**PEDS 517 Exercise Biochemistry Techniques**

★3 (*fi 6*) (either term, 1-0-3). This is primarily a laboratory experience for students to gain competencies in performing basic histochemical and biochemical procedures that are common in exercise physiology research. Prerequisite: consent of the Instructor.

**PEDS 518 Hormonal Response to Exercise**

★3 (*fi 6*) (either term, 1.5-2s-0). Designed to increase the student's knowledge about normal endocrine physiology and the hormonal response to acute and chronic exercise. Variables that influence the hormonal response to exercise and its subsequent measurement in circulation will be addressed. The use of hormonal analysis for monitoring health, body composition and training status of athletes will also be discussed. Offered in alternate years.

**PEDS 530 Adapted Physical Activity**

★3 (*fi 6*) (either term, 0-3s-0). Seminar on current theoretical, practical and research issues in adapted physical activity.

**PEDS 540 The Psychology of Performance Enhancement in Sport and Physical Activity**

★3 (*fi 6*) (either term, 0-3s-0). This seminar focuses on the role of psychology as it relates to performance enhancement in the areas of sport and physical activity. Performance constructs and skills along with mental skills training programs will be discussed and evaluated.

**PEDS 541 Positive Youth Development Through Sport and Physical Activity**

★3 (*fi 6*) (either term, 0-3s-0). Positive Youth Development (PYD) is a strength-based conception of childhood and adolescence. From the PYD Perspective, youth are viewed as 'resources to be developed' rather than 'problems to be managed.' Through this course the potential for promoting positive youth development through sport and physical activity will be explored. Prerequisites: PEDS 403, or equivalent, or permission of the instructor.

**PEDS 544 Psychosocial Dimensions of Athletic Behaviour in the Competitive Sport Environment**

★3 (*fi 6*) (either term, 0-3s-0). A theoretical analysis of psychosocial constructs in sport including competitive anxiety, motivation, perfectionism, burnout, aggression, moral reasoning, enjoyment, and sport injury. Frequently examines the construct validation processes that researchers employ in the development of latent constructs and associated nomological networks.

**PEDS 545 Physical Activity and Cancer**

★3 (*fi 6*) (either term, 0-3s-0). An overview of the role of physical activity in

cancer control. Specifically, physical activity is examined for its role in cancer prevention, coping with treatments, rehabilitation after treatments, palliative care, long term survival, secondary prevention and survival. A multidisciplinary perspective draws on kinesiology, oncology, nursing, epidemiology, psychology, rehabilitation medicine and health promotion.

**PEDS 570 Coaching Seminar I**

★3 (*fi 6*) (either term, 0-3s-0). This course is the first of two courses designed as a series of specialized topics related to coaching. Seminar topics may include: Energy Systems; Nutrition for Optimal Performance; Environmental Factors and Performance; and Recovery and Regeneration. Prerequisite: consent of Faculty

**PEDS 571 Coaching Seminar II**

★3 (*fi 6*) (either term, 0-3s-0). This course is the second of two courses designed as a series of specialized topics related to coaching. Seminar topics may include: Psychological Preparation for Coaches; Planning and Periodization; Athlete Long-term Development, Self-awareness and Personal Management and the Canadian Sport System. Prerequisite: consent of Faculty.

**PEDS 572 Coaching Practicum**

★6 (*fi 12*) (two term, variable). Students will be required to coach for a complete season as head coach or assistant coach with major responsibilities in High Performance program approved by the student's Coaching Mentor. The purpose of the practicum is to provide students with practical experience of running their own High Performance program for an entire duration of 1 annual cycle that will include 1 competitive season. Note: a minimum of 250 hours of outside-classroom time is required. Prerequisite: consent of the Faculty.

**PEDS 580 The Nature of Scientific Inquiry in Physical Education and Sport Studies**

★3 (*fi 6*) (either term, 0-3s-0). An introduction to the basic philosophy and nature of scientific inquiry as it applies to contemporary research. Prerequisite: PEDS 309 or consent of Faculty.

## 231.221 Physical Education, Recreation and Leisure Studies, PERLS

Faculty of Physical Education and Recreation

**Undergraduate Courses**

**Note:** Enrolment in all PERLS courses is restricted to students registered in the Faculty of Physical Education and Recreation, or students registered in specified programs that require PERLS courses to meet degree requirements. Other students must obtain prior approval of the Faculty.

**PERLS 104 Introduction to Sociocultural Aspects of Leisure and Sport**

★3 (*fi 6*) (either term, 2-1s-0). The study of play, physical education, recreation, sport, and leisure as institutionalized ways in which society organizes and teaches attitudes and skills. Provides an introduction to the importance of sociocultural inquiry and the notion of being critical as an empowering process.

**PERLS 105 Introduction to the Management of Sport, Physical Activity and Recreation Programs**

★3 (*fi 6*) (either term, 3-0-1). Provides students with an introduction to the management concepts required to successfully administer a sport, recreation or physical activity.

**PERLS 204 Leisure and Sport in Canadian Society: Historical Perspectives**

★3 (*fi 6*) (either term, 3-0-0). An examination of the significant changes which have occurred in leisure and sport, specifically over the last century and with particular reference to Canadian society. Prerequisite: PERLS 104.

**PERLS 207 Physical Activity and Leisure for Special Populations**

★3 (*fi 6*) (either term, 3-0-0). An introduction into the current trends in the theory and practice in physical education and recreation from special groups. The course includes a survey of special populations and their implications for service delivery.

**PERLS 304 Sport and Leisure in Canadian Society: Sociological Perspectives**

★3 (*fi 6*) (either term, 2-1s-0). What it means to bring a sociological imagination to the study of sport and leisure with particular reference to Canadian society. Prerequisites: PERLS 104 and 204.

**PERLS 335 Volunteers Management in Recreation, Sport and Physical Activity**

★3 (*fi 6*) (either term, 3-0-0). An examination of the specific role played by volunteer management in the delivery of recreation, sport and physical activity programs, including the structure and processes of the voluntary organizations that make up the recreation delivery system. Prerequisite: PERLS 105. Note: credit will be granted for only one of RLS 335 or PERLS 335.

**PERLS 350 Advanced Analysis of Sport and Leisure Organizations**

★3 (*fi 6*) (either term, 3-0-0). Theoretical consideration for the organization and

administration of physical education, sport, recreation, and leisure programs. Prerequisite: PERLS 105.

**PERLS 351 Cultural Studies of Sport and Leisure**

★3 (fi 6) (either term, 0-3s-0). A seminar that explores selected contemporary topics in sport from a critical socio-cultural perspective. Pre/Corequisite: PERLS 304, or consent of the instructor.

**PERLS 370 Assessment and Service Delivery for Special Populations**

★3 (fi 6) (either term, 3-0-1). An overview of basic qualitative and quantitative assessment principles and their use to deliver quality physical activity and recreation services for special needs populations. Prerequisites: PERLS 207 and PEDS 309 or STAT 141 or 151.

**PERLS 371 Assessment and Evaluation in Physical Activity for Children and Youth**

★3 (fi 6) (either term, 3-0-1). Provides an overview of basic assessment principles and their application in the provision of physical activity for children and youth. Designed for individuals who are particularly interested in assessment of movement, and its concomitant goals, for the purpose of instruction and evaluation. Prerequisite: PERLS 207.

**PERLS 411 The Business of Hockey**

★3 (fi 6) (either term, 3-0-0). This course explores strategic, economic, and cultural issues related to the business of hockey - with a specific focus on the National Hockey League. Students will develop a critical understanding of the hockey industry and its stakeholders. Prerequisite: students should be in the third or fourth year of their degree program.

**PERLS 420 Play: The Foundation of Recreation, Sport and Physical Activity**

★3 (fi 6) (either term, 3-0-0). This course will provide students with an in-depth understanding of the concept of play. It will offer learning experiences that will enable students to create play in various recreation, sport, tourism and physical activity contexts. Prerequisite: RLS 100 or HE ED 110

**PERLS 440 Play Around the World Program Preparation**

★3 (fi 6) (Spring/Summer, variable). The "Play Around the World" project provides a 3-month internationally based, cross-cultural field placement working with underserved populations in the area of play, recreation and sport. Students apply and are selected in Fall term, and then have a significant time commitment during the Winter term to prepare for their Intersession field placement. Travel takes place May through August. This course represents the theoretical aspect of the experience, and involves written and creative work in the area of programming in cross-cultural settings. Prerequisite: PERLS 497 (Play Leadership) is strongly recommended. Corequisite: PERLS 441

**PERLS 441 Play Around the World - Field Placement**

★3 (fi 6) (Spring/Summer, variable). The "Play Around the World" project provides a 3-month internationally based, cross-cultural field placement working with underserved populations in the area of play, recreation and sport. Students apply and are selected in Fall term, and then have a significant time commitment during the Winter term to prepare for their Intersession field placement. Travel takes place May through August. This course represents the experiential part of the project. Prerequisite: PERLS 497 (Play Leadership) is strongly recommended. Corequisite: PERLS 440

**PERLS 450 Process Management**

★3 (fi 6) (either term, 3-0-0). This course will introduce students to some of the concepts associated with process management and how, through the use of strategies associated with these concepts, individuals can assist organizations toward their desired goals. Such human processes as communication; problem solving and decision making; creating, building and maintaining a group; intergroup relationships; initiating and managing change; and assessing performance will be considered. Prerequisite: PERLS 350.

**PERLS 452 Leisure Facilities: Planning and Management**

★3 (fi 6) (either term, 0-3L-0). An examination of the planning, design, and management processes associated with leisure facilities (inclusive of sport, recreation, and tourism facilities). Attention is focused on the provision of leisure opportunities of a predominantly intensive-use nature which tend to occur in an urban or near-urban setting. These facilities will be considered within the context of the communities in which they function. Note: Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisite: PERLS 105.

**PERLS 495 Senior Research Experience**

★3 (fi 6) (either term, 0-3s-0). This is an independent study course that allows fourth year students to explore a topic under the supervision of a Doctoral student. Students will choose an area of interest from a list of topics provided by the course coordinator. Students will use the resources of libraries, laboratories, and current research projects with the goal of gaining an understanding of the process of conducting research. The student will be introduced to methodology and theory in a designated research area through reading, discussion, and potentially practical application. Note: Students must have a minimum GPA of 3.0 over their last 30 credits. Prerequisite: PEDS 409 or RLS 210, and consent of the Faculty.

**PERLS 497 Selected Topics in Physical Education, Recreation and Leisure Studies**

★3 (fi 6) (either term, variable). A course offered on a topic of current interest in physical education and sport. Topics may vary from year to year. Prerequisite: Consent of Faculty.

**PERLS 499 Directed Studies**

★3 (fi 6) (either term, variable). A course designed to meet the needs of individual students. Prerequisite: Consent of Faculty.

**Graduate Courses**

**PERLS 504 The History of Nature, Parks, and Travel**

★3 (fi 6) (either term, 0-3s-0). Examines history at the crossroads of nature, parks, and travel. It concerns the formation of ideas about nature expressed through leisure. Topics include: adventure, exploration, national parks, wildlife conservation, mountaineering, canoeing, wilderness art, recreation, youth movements, urban parks, holidays, cultural heritage, and tourism. Attention is given to the study of Canadian life in the 19th and 20th centuries, along with international tangents.

**PERLS 506 Socio-cultural Perspectives on the Body and Health**

★3 (fi 6) (either term, 0-3s-0). Examines contemporary socio-cultural discussions and debates regarding the body as a social phenomenon, with a particular focus on understanding intersections of the body, physical activity, exercise and health. In doing so, questions regarding social construction, representation and regulation of bodies as well as experiences of embodiment will be examined.

**PERLS 507 Sport and Popular Culture**

★3 (fi 6) (either term, 0-3s-0). An examination of the place of sport in contemporary Canadian popular culture, with three principal aims: 1) To offer an introduction to Cultural Studies and its key concepts; 2) To give students a chance to think about how social difference and inequality work in contemporary Canadian society, and how it is reflected in the world of sport and leisure; and 3) To examine the effects of both cultural and economic globalization on sport and Canadian society.

**PERLS 541 Social Cognitive Approaches to Health Promoting Behaviors**

★3 (fi 6) (either term, 0-3s-0). This course will address social-cognitive theories as they relate to behavioral change in the broad areas of health-promoting-behaviors (HPBS) with particular emphasis on physical activity. The theories and models to be covered will include Stages of Change, Social-Cognitive and Self-efficacy, Reasoned Action and Planned behavior, Self-esteem (various), etc. The specific context areas and order of classes will be determined in consultation with the class members each term. Areas of common interest will be identified and used as the basis for classes and examples throughout the term. The course is appropriate for individuals interested in social psychological and social-cognitive influences on health promoting behaviors and sport performance. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

**PERLS 550 Sport and Leisure Organizations and the Public Sector**

★3 (fi 6) (either term, 0-3s-0). Emphasis is on the role of the federal, provincial and municipal governments in Canada in amateur sport and leisure including the interorganizational relations between the public sector and nonprofit/voluntary amateur sport and leisure organizations.

**PERLS 551 Organizational Analysis of Sport and Leisure**

★3 (fi 6) (either term, 0-3s-0). Concepts and perspectives in organizational theory are examined in relation to sport and leisure organizations in the public, nonprofit/voluntary, and commercial sector to help students understand and analyze the complexity of managing sport and leisure organizations effectively. Topics include, but are not limited to, organizational design, organizational environments, strategy and decision-making, organizational culture, power and politics, and conflict and change.

**PERLS 575 Coaching Knowledge: The Social Dimensions of Performance Sport**

★3 (fi 6) (either term, 0-3s-0). A critical examination of the construction of coaches' knowledge and what makes coaches effective.

**PERLS 577 Sport and Ethics**

★3 (fi 6) (either term, 0-3s-0). An examination of ethical problems in sport. Prerequisite: PEDS 401 or consent of Faculty.

**PERLS 581 Social Research Applications to Leisure and Sport**

★3 (fi 6) (either term, 0-3s-0). An examination of both quantitative and qualitative research methodologies as they apply to the sociocultural area of sport and physical education and to the general field of leisure studies.

**PERLS 582 Graduate Seminar: A Seminar in Current Factors, Problems and Issues**

★3 (fi 6) (either term, 0-3s-0).

**PERLS 590 Research and Directed Studies I**

★3 (fi 6) (either term, 0-3s-0).

**PERLS 591 Research and Directed Studies II**

★3 (fi 6) (either term, 0-3s-0).



**PERLS 599 Directed Studies and Research**

★3 (fi 6) (two term, 0-1.5s-0).

**PERLS 613 Special Topics in the Socio-Cultural Study of Leisure, Sport, and Health**

★3 (fi 6) (either term, 0-3s-0). Explores topics in the socio-cultural study of leisure, sport, and health that are of interest to students enrolled in the course.

**PERLS 690 Directed Studies and Research**

★3 (fi 6) (either term, 0-3s-0).

**PERLS 691 Directed Studies and Research**

★3 (fi 6) (either term, 0-3s-0).

**PERLS 699 Directed Studies and Research**

★3 (fi 6) (two term, 0-1.5s-0).

**PERLS 900 Directed Research Project**

★6 (fi 12) (variable, unassigned). A significant piece of scholarly writing. This course used by course-based Master's students.

## 231.222 Physical Therapy, PTher

Department of Physical Therapy  
Faculty of Rehabilitation Medicine**Note:** All PTher courses are open to Physical Therapy students only or by consent of the Department.

### Graduate Courses

**PTher 500 Movement Analysis**

★3 (fi 6) (either term, 3-0-2 in 14 weeks). Introduction to mechanical and analytical concepts pertinent to physical therapy. Content will include the systematic analysis of posture, balance, typical and atypical gait, functional movements and the influence of person, task, and environment on task performance.

**PTher 504 Clinical Exercise Physiology**

★3 (fi 6) (either term, 2-0-1.5 in 15 weeks). This course examines the acute and chronic physiological responses to exercise and explores the use of exercise in the management of chronic diseases and disabilities.

**PTher 511 Introduction to Clinical Education**

★0.5 (fi 1) (either term or Spring/Summer, 10 hours). Credit. Seminars on the theory and practice of experiential learning will prepare students for clinical placements with diverse populations. Emphasis will be placed on professionalism and supervision and evaluation methods.

**PTher 516 Anatomy**

★3 (fi 6) (either term, 3-0-3 in 14 weeks). Anatomy of the upper limb, lower limb and trunk. Specific emphasis on knowledge of joints, ligaments, nerve supply and deep muscles.

**PTher 517 Clinical Placement I**

★1 (fi 2) (either term, 1 week). Introduction to clinical practice in approved clinical affiliations.

**PTher 518 Clinical Placement II**

★1-6 (variable) (either term or Spring/Summer, 6 weeks). Credit. Clinical practice in approved clinical affiliations.

**PTher 520 Clinical Placement III**

★1-6 (variable) (either term, 6 weeks). Credit. Clinical practice in approved clinical affiliations. Can be combined with INT D 411 for an interdisciplinary placement for a combined weighting.

**PTher 521 Clinical Placement IV**

★1-6 (variable) (either term, 6 weeks). Credit. Clinical practice in approved clinical affiliations. Can be combined with INT D 411 for an interdisciplinary placement for a combined weighting.

**PTher 522 Clinical Placement V**

★1-6 (variable) (either term or Spring/Summer, 6 weeks). Credit. Clinical practice in approved clinical affiliations. Can be combined with INT D 411 for an interdisciplinary placement for a combined weighting.

**PTher 523 Clinical Placement VI**

★1-6 (variable) (either term, 6 weeks). Credit. Clinical practice in approved clinical affiliations. Can be combined with INT D 411 for an interdisciplinary placement for a combined weighting.

**PTher 524 Professional Issues I: Introduction to Physical Therapy Practice**

★2 (fi 4) (either term, 1.5-2.5S-0 in 15 weeks). Credit. Introduction to physical therapy including theory and concepts of rehabilitation science. Content will include communication, professional ethics and conduct, disability issues, models of disablement, client centered principles and self reflection. A model of practice and clinical decision making will be presented

**PTher 525 Professional Issues II - Health Care, Ethics and Medical-Legal Issues**

★2 (fi 4) (either term or Spring/Summer, 3-5s-0 in 3 weeks). Credit. Continuation of the study of professional issues relevant to the practice of physical therapy. Ethical, cultural, medical-legal and regulatory issues and their impact on professional practice. Prerequisites: INT D 410 and PTher 524.

**PTher 526 Professional Issues III - Business and Professional Responsibility in Physical Therapy**

★2 (fi 4) (either term, 2-2s-0 in 10 weeks). Administrative issues in the public and private health care sectors will focus on impact of health policy, payment systems, funding proposals and business planning and ethics. Professional responsibilities in professional practice will emphasize supervision of physical therapy students and therapist assistants and continuing competency. Prerequisite: PTher 525.

**PTher 528 Foundations of Physical Therapy**

★5 (fi 10) (either term, 3-2S-5 in 10 weeks). Introduction to the theory and application of physical therapy skills with an emphasis on assessment and handling techniques. Functional application of anatomy knowledge will be emphasized. Corequisite: PTher 516.

**PTher 530 Research and Directed Studies**

★3 (fi 6) (either term, 3-0-0). Work on a special project under the supervision of a faculty member. Prior approval of the instructor and the student's advisor required.

**PTher 531 Research and Directed Studies**

★3 (fi 6) (either term, 3-0-0). Work on a special project under the supervision of a faculty member. Prior approval of the instructor and the student's advisor required.

**PTher 532 Research and Directed Studies**

★3 (fi 6) (two term, 1.5-0-0). Work on a special project under the supervision of a faculty member. Prior approval of the instructor and the student's advisor required.

**PTher 533 Research and Directed Studies**

★6 (fi 12) (two term, 3-0-0). Work on a special project under the supervision of a faculty member. Prior approval of the instructor and the student's advisor required.

**PTher 534 Integrated Practice I**

★1.5 (fi 3) (either term, 0-2s-2 in 8 weeks). Active learning strategies, including the use of case scenarios, will be used to integrate students' learning in the block. Critical thinking skills are required to integrate knowledge of clinical skills, research application, measurement and evaluation, and professional issues.

**PTher 535 Integrated Practice II**

★1.5 (fi 3) (either term, 0-2s-1.5 in 7 weeks). Active learning strategies, including the use of case scenarios, will be used to integrate students' learning in the block. Critical thinking skills are required to integrate knowledge of clinical skills, research application, measurement and evaluation, and professional issues. Prerequisite: PTher 534, 538 and 544.

**PTher 536 Integrated Practice III**

★1.5 (fi 3) (either term, 0-2s-1.5 in 7 weeks). Active learning strategies, including the use of case scenarios, will be used to integrate students' learning in the block. Critical thinking skills are required to integrate knowledge of clinical skills, research application, measurement and evaluation, and professional issues. Prerequisite: PTher 535. Corequisite: PTher 548.

**PTher 537 Integrated Practice IV**

★3 (fi 6) (either term or Spring/Summer, 0-10s-0 in 4 weeks). Self-directed learning applied to complex client scenarios across the continuum of care. Critical thinking skills are required to integrate knowledge of clinical skills, research application, measurement, evaluation and professional issues. Prerequisite: INT D 410, PTher 526, 536 and 548.

**PTher 538 Musculoskeletal**

★4 (fi 8) (either term, 2-2s-4 in 15 weeks). The study of acute musculoskeletal conditions. Areas of practice will include: an understanding of pathology, assessment, intervention, outcome evaluation, relevant therapeutic exercise, electrophysical agents and evidence-based skills. These clinical skills will be integrated into the context of clinical practice with issues in research application, measurement and evaluation. Prerequisites: PTher 528.

**PTher 540 Practicum**

★0 (fi 3) (either term, unassigned). A practicum in the student's area of concentration and interest to be taken by the student if his/her committee feels the student needs, or the student desires, further practical experience. This course may involve experience off campus in any geographical area where the student may gain the necessary experience.

**PTher 544 Cardiorespiratory**

★2 (fi 4) (either term, 1.5-0-2 in 15 Wks). The study of acute cardiorespiratory conditions. Areas of practice will include: an understanding of pathology, assessment, intervention, outcome evaluation, relevant therapeutic exercise, electrophysical agents and evidence-based skills. These clinical skills will be integrated into the

context of clinical practice with issues in research application, measurement and evaluation. Prerequisites: PTher 516, 528, 541.

#### **PTher 545 Tissue Mobilization I**

★2 (fi 4) (either term or Spring/Summer, 1.5-1s-3 in 6 weeks). An introduction to the use of mobilization techniques and associated therapeutic exercise to treat selected peripheral conditions. Corequisite: PTher 538.

#### **PTher 546 Adult Neurology**

★3 (fi 6) (either term, 3-1.5s-3 in 10 weeks). Introduction to the theory and application of physical therapy in neurology with adults. Areas of practice will include assessment, intervention, outcome evaluation, therapeutic exercise, electrophysical agents, and evidence-based skills. These clinical skills will be integrated into the context of practice with relevant issues in research application, measurement and evaluation. Corequisite: PTher 565, 563 and 567. Prerequisites: PTher 542 and 544.

#### **PTher 548 Physical Therapy in Long-term Conditions I**

★3 (fi 6) (either term, 6-3S-5 in 6 weeks). Study of the theory and application of physical therapy in clients with selected musculoskeletal and neurological conditions of a long-term nature. Associated secondary conditions and assistive technology will also be addressed. Areas of practice will include assessment, intervention, outcome evaluation, therapeutic exercise, electrophysical agents, and evidence-based skills. These clinical skills will be integrated into the context of practice with relevant issues in research application, measurement and evaluation. Prerequisites: PTher 538, 542, 544, 546, 563 and 565.

#### **PTher 549 Tissue Mobilization II**

★2.5 (fi 5) (either term, 1-1.5s-3 in 11 weeks). The use of mobilization, stabilization and manipulation techniques and associated therapeutic exercise to treat selected peripheral and spinal dysfunction. These clinical skills will be integrated into the context of practice with relevant issues in research application, measurement and evaluation. Prerequisite: PTher 538.

#### **PTher 554 Elective**

★1-3 (variable) (variable, unassigned). Students can register in these for credit towards the MScPT requirement of 3 credits in elective coursework. A variety of topic areas may be offered. Note: Course title is variable; course may be repeated.

#### **PTher 555 Therapeutic Physical Agents**

★1.5 (fi 3) (either term, 1-0-1.5 in 15 weeks). Theory and practice of the application of therapeutic physical agents in physical therapy. Use of these agents will be integrated into the context of practice with issues in research, application and outcome evaluation. Prerequisite: PTher 528.

#### **PTher 558 Medications in Physical Therapy**

★2 (fi 4) (either term or Spring/Summer, 20 Hours in 4 weeks). Pharmacology and management of medications commonly seen in physical therapy.

#### **PTher 560 Individual Study/Special Subject**

★1-6 (variable) (either term or Spring/Summer, variable). Registration will be contingent on the student's having made prior arrangements with the Department. Credit for this course may be obtained more than once. Prerequisite: consent of Department.

#### **PTher 561 Physical Therapy in Long-term Conditions II**

★2 (fi 4) (either term, 5-3s-4 in 5 weeks). Study of the theory and application of physical therapy in clients with selected musculoskeletal, cardiovascular, and integumentary conditions of a long-term nature. Areas of practice will include assessment, intervention, outcome evaluation, therapeutic exercise, electrophysical agents, and evidence-based skills. These clinical skills will be integrated into the context of practice with relevant issues in research application, measurement and evaluation. Prerequisites: PTher 538, 542, 544, 546, 563 and 565.

#### **PTher 562 Diagnostic Imaging**

★2 (fi 4) (either term or Spring/Summer, 1.5-1.5s-0 in 6 weeks). Introduction to current diagnostic imaging techniques encountered and utilized by physical therapists. Content will include the theoretical and physical principles of select ionizing and non-ionizing radiographic techniques and other diagnostic procedures and indications and processes involved in ordering diagnostic images

#### **PTher 563 Gross Motor Development and Pediatric Physical Therapy**

★2 (fi 4) (either term, 2-1.5s-1.5 in 10 weeks). Introduction to theories of motor development and a systematic observational approach to the assessment of gross motor skills in infancy and childhood. Introduction to issues in pediatric physical therapy including assessment and intervention approaches for children with developmental motor disabilities, appropriate outcome measures, service delivery models, important research findings and current issues. Corequisite: PTher 546, and PTher 567. Prerequisites: PTher 542 and 544.

#### **PTher 565 Aging and Physical Therapy**

★1.5 (fi 3) (either term, 1-1.5s-1 in 8 weeks). An examination of age-related changes, prevalent age-related conditions treated by physical therapists and contextual factors that influence the activity and participation of older adults. Prerequisites: PTher 538 and PTher 544. Corequisite: PTher 546.

#### **PTher 567 Neuroanatomy and Neuroscience for Rehabilitation**

★3 (fi 6) (either term, 5-0-0 in 8 weeks). Structures and functions of the human nervous system. Emphasis is on the effects of injury, diseases and rehabilitation

training on the nervous system. Corequisite: PTher 546 and 563. Prerequisites: PTher 516, 544 and 538.

#### **PTher 570 Measurement and Evaluation in Physical Therapy**

★3 (fi 6) (either term, 2-0-2.5). The principles involved in measurement and evaluation and their application in the practice of physical therapy.

#### **PTher 572 Basic Concepts in Evidence-Based Practice**

★2.5 (fi 5) (either term or Spring/Summer, 2-2s-0 in 10 weeks). Introduction to research methods with an emphasis on issues of measurement and evaluation in rehabilitation science and application of the knowledge to a critical evaluation of a selected measure used in physical therapy. Students will apply advanced information retrieval strategies to rehabilitation science literature. Note: not open to students with credit in PTher students with credit in PTher 541. Corequisite: PTher 528.

#### **PTher 573 Applied Concepts in Evidence-Based Practice**

★2 (fi 4) (either term or Spring/Summer, 2-6S-0 4 wks). Identification and evaluation of best evidence for a client observed during clinical placement. Critical appraisal methodologies such as single subject design, critically appraised topics, systematic review and clinical practice guidelines will be introduced and applied to the clinical context. Note: not open to students with credit in PTher 542. Prerequisite: PTher 572.

#### **PTher 574 Advanced Concepts in Evidence-Based Practice**

★2 (fi 4) (either term or Spring/Summer, 0-6s-0 in 4 weeks). Advanced concepts in measurement of clinical effectiveness such as program evaluation, quality improvement initiatives, and evaluation of synthesized sources. Prerequisites: PTher 572 and 573.

#### **PTher 900 Major Project**

★3 (fi 6) (either term, unassigned). Credit. This capping exercise has 2 components: a practical examination of clinical skills and a group written evaluative project with an individual oral examination. Prerequisite: Consult Department.

## 231.223 Physics, PHYS

Department of Physics  
Faculty of Science

#### **Notes**

- (1) Credit may normally be obtained for only one of PHYS 124, 144 or EN PH 131 or SCI 100.
- (2) Credit may normally be obtained for only one of PHYS 126, 130, 146 or SCI 100.
- (3) Credit may normally be obtained for only one of PHYS 230 or 281.
- (4) Credit may normally be obtained for only one of PHYS 208 or 271.
- (5) Also see Astronomy (ASTRO) and Geophysics (GEOPH) and Mathematical Physics (MA PH) listings for other courses offered by the Department of Physics.
- (6) PHYS 301, 308, and 364 are offered alternate years only. Please consult the Department for course scheduling.
- (7) If a student plans to proceed from PHYS 124 to PHYS 146, it is strongly recommended that the student achieve a minimum grade of B- in PHYS 124.

### Undergraduate Courses

#### **0 PHYS 114 Physics: The Big Picture**

★3 (fi 6) (either term, 3-0-0). A qualitative and mostly non-mathematical course in which the overall structure and main concepts of physics are examined. Classical versus quantum worlds; order versus chaos; Newton's versus Einstein's universe; selected topics and issues in modern physics. Prerequisites: Pure or Applied Mathematics 30 or Mathematics 30-1. Note: This course does not qualify as an equivalent to high school Physics 30. This course also does not qualify as a prerequisite for 200 or higher level ASTRO, GEOPH, MA PH, or PHYS courses. Not accepted as part of the Physics requirements for Faculty of Medicine and Dentistry applications.

#### **0 PHYS 124 Particles and Waves**

★3 (fi 6) (either term, 3-0-3). Algebra-based course primarily for students in life, environmental, and medical sciences. It guides the student through two distinct types of motion: motion of matter (particles) and wave motion. Vectors, forces, bodies in equilibrium, review of kinematics and basic dynamics; conservation of momentum and energy; circular motion; vibrations; elastic waves in matter; sound; wave optics; black body radiation, photons, de Broglie waves. Examples relevant in environmental, life, and medical sciences will be emphasized. Prerequisites: Physics 20 or equivalent, Pure Mathematics 30 or Mathematics 30-1. Physics 30 is strongly recommended. Note: Credit may be obtained for only one of PHYS 124, 144, EN PH 131 or SCI 100. Note: To proceed to PHYS 146 after taking PHYS 124, it is strongly recommended that a minimum grade of B- be achieved in PHYS 124.

#### **0 PHYS 126 Fluids, Fields, and Radiation**

★3 (fi 6) (either term, 3-0-3). A continuation of PHYS 124 primarily for students in

life, environmental, and medical science. Fluid statics and dynamics, gases, kinetic interpretation; electrostatics; currents and circuits; magnetic field; electromagnetic induction; nuclear radiation, its interaction with matter and applications. Prerequisite: PHYS 124 or PHYS 144. Note: Credit may be obtained for only one of PHYS 126, 130, 146 or SCI 100.

### PHYS 130 Wave Motion, Optics, and Sound

★3.8 (fi 6) (either term, 3-0-3/2). Geometrical optics, optical instruments, oscillations, waves, sound, interference, diffraction. Prerequisites: Pure Mathematics 30 or Mathematics 30-1, Mathematics 31, Physics 30. Corequisite: MATH 100 or 113 or 114 or 117 or equivalent. Restricted to Engineering students. Other students who take this course will receive ★3.0.

### PHYS 144 Newtonian Mechanics and Relativity

★3 (fi 6) (first term, 3-0-3). A calculus-based course for students majoring in the physical sciences. Newtonian mechanics, including kinematics, dynamics, conservation of momentum and energy, rotational motion and angular momentum; special relativistic kinematics and dynamics, including length contraction, time dilation, and the conservation of energy and momentum in special relativity. Prerequisites: Pure Mathematics 30 or Mathematics 30-1, Physics 30. Mathematics 31 is strongly recommended. Corequisites: MATH 113 or 114 or 117 or equivalent. Note: Credit may be obtained for only one of PHYS 124, 144, EN PH 131 or SCI 100.

### PHYS 146 Fluids and Waves

★3 (fi 6) (second term, 3-0-3). A calculus-based course for students majoring in the physical sciences. Fluid statics and dynamics, elasticity and simple harmonic motion; sound waves, wave properties of light; quantum waves, wave-particle duality. Prerequisite: PHYS 124 (see Note following) or 144. Corequisite: MATH 115 or 118 or equivalent. Note: Credit may be obtained for only one of PHYS 126, 130, 146 or SCI 100. NOTE: To proceed to PHYS 146 after taking PHYS 124, it is strongly recommended that a minimum grade of B- be achieved in PHYS 124.

### PHYS 208 Aspects of Modern Physics

★3 (fi 6) (either term, 3-0-0). Experimental evidence for limitations of classical physics; Einstein's special theory of relativity; length contraction; time dilation; twin paradox; equivalence of mass and energy; relativistic mass and momentum; the photo-electric effect, the Compton effect, X-ray production and electron diffraction; a discussion of the Heisenberg uncertainty principle and the Schrodinger equation including applications of one dimensional potential wells and barriers; tunnelling; the simple harmonic oscillator; atomic physics; hydrogen atom; periodic table. Prerequisites: PHYS 126 or 146; MATH 113 or 114. SCI 100 may be used in lieu of PHYS 126 or 146 and MATH 113 or 114. Credit may be obtained in only one of PHYS 208 or 271.

### PHYS 230 Electricity and Magnetism

★3.8 (fi 6) (either term, 3-0-3/2). Electric fields, Gauss' Law; electric potential; capacitance and dielectrics; electric current and resistance; magnetic fields, Ampere's Law; Faraday's Law; inductance; magnetic properties of matter. Prerequisites: PHYS 130 or 146, and MATH 100 or 113 or 114 or 117. Pre- or corequisite: MATH 101 or 115 or 118. For Science students only; SCI 100 may be used in lieu of PHYS 146, MATH 114 and 115. Note: Restricted to Engineering students. Other students who take this course will receive ★3.0. Credit may normally be obtained for only one of PHYS 230 or 281.

### PHYS 234 Introductory Computational Physics

★3 (fi 6) (either term, 3-0-3). Algorithms for scientific data analysis: sorting methods, polynomial fitting, regression, interpolation, and Fourier analysis; techniques for solving physics and geophysics problems with selected topics from mechanics, waves, geometrical optics and ray tracing, electricity and magnetism, statistical physics, decay processes, quantum physics, signal processing. Prerequisites: PHYS 126 or 146 or EN PH 131, and MATH 100 or 113 or 114 or 117, and MATH 102 or 120 or 125 or 127. SCI 100 may be used in lieu of PHYS 126 or 146 and MATH 114.

### PHYS 244 Mechanics

★3 (fi 6) (either term, 3-0-0). Particle dynamics; oscillating systems and normal modes; conservative forces and energy; introduction to Lagrangian and Hamiltonian dynamics; central forces; orbital motion and scattering. Prerequisite: PHYS 126 or 146 or EN PH 131 or SCI 100. Corequisite: MATH 120 or 125 or 127 or 102 or equivalent, MATH 209 or 215 or 317 or equivalent.

### PHYS 261 Physics of Energy

★3 (fi 6) (either term, 3-0-0). Energy in its various forms; conservation of energy; basic thermodynamics of ideal gases and phase changes; heat engines and refrigerators; consumption of energy resources; space heating and heat transfer; radioactivity; nuclear fission and nuclear power; alternative and renewable energy resources. Prerequisites: PHYS 124 and 126 (or equivalent) and MATH 113 or 114. SCI 100 may be used in lieu of PHYS 124, 126 and MATH 114.

### PHYS 271 Introduction to Modern Physics

★3 (fi 6) (either term, 3-0-0). Experimental evidence for limitations of classical physics; review of special relativity: quantization of charge, light, and energy; blackbody radiation, photoelectric effect, Compton effect; models of the atom; wavelike properties of particles; the uncertainty principle, the Schrodinger Equation,

the infinite and finite square well, the harmonic oscillator, tunneling; the hydrogen atom, orbital angular momentum and electron spin; spin and statistics; selected topics. Prerequisite: PHYS 126 or 146 or EN PH 131 or SCI 100. Pre- or Corequisite: MATH 209 or 215 or 317 or equivalent. Note: Credit may be obtained in only one of PHYS 208 or 271.

### PHYS 281 Electricity and Magnetism

★3 (fi 6) (either term, 3-0-0). Electric fields; Gauss' law; electric potential; capacitance and dielectrics; electric current and resistance; DC circuits; magnetic fields; Ampere's Law; Faraday's Law; inductance; magnetic properties of matter, AC circuits; Maxwell's equations; electromagnetic waves. Prerequisite: PHYS 126 or 146 or EN PH 131 or equivalent, or SCI 100. Corequisite: MATH 209 or 214 or 217 or equivalent. Credit may normally be obtained for only one of PHYS 230 or 281.

### PHYS 292 Physics Laboratory A

★3 (fi 6) (two term, 0-0-3). Experiments in mechanics, electromagnetism and atomic physics. Corequisites: PHYS 281 or 230, and MATH 209 or 214 or equivalent. Note: Restricted to Engineering students.

### PHYS 294 General Physics Laboratory

★3 (fi 6) (either term, 0-0-6). Introduction to methods of experimental physics with examples from modern physics. Prerequisite: MATH 113 or 114 or 117 or 100, and PHYS 126 or 146 or equivalent, or SCI 100. Note: Not to be taken by Specialization or Honors students in Physics, Geophysics or Mathematical Physics. Credit may be obtained in only one of PHYS 294 or 295.

### PHYS 295 Experimental and Statistical Methods of Physics

★3 (fi 6) (either term, 0-0-6). Detection of radioactive emissions using a Geiger counter, determination of the absolute zero of temperature using a gas thermometer, and other experiments illustrating the analysis of experimental data. Prerequisites: PHYS 126 or 146, and MATH 115 or 101 or 118. SCI 100 may be used in lieu of PHYS 126 or 146 and MATH 115. Credit may be obtained in only one of PHYS 294 or 295.

### PHYS 297 Classic Experiments in Physics

★3 (fi 6) (either term, 0-0-6). Choice of modern physics experiments including speed of light, measurement of  $e/m$ , Balmer series in hydrogen, photoelectric effect, and the Millikan oil drop and Franck-Hertz experiments. Prerequisite: PHYS 294 or 295. Corequisites: PHYS 208 or 271. Pre- or corequisites: PHYS 230 or 281, and MATH 101 or 115 or 118 or SCI 100.

### PHYS 301 Particles, Nuclei, and the Cosmos

★3 (fi 6) (either term, 3-0-0). Relativity; properties and structure of the nucleus; radioactivity, carbon dating, tracer techniques; nuclear fission; fusion; nuclear reactors; elementary particles and particle accelerators; standard model; astrophysics; cosmology. Prerequisite: PHYS 208 or 271; MATH 115 or 101 or 118 or SCI 100. Note: This course is not available for credit toward Honors Physics and Mathematical Physics degree programs. Offered alternate years only. Consult Department for course scheduling.

### PHYS 308 Statistical, Molecular, and Solid State Physics

★3 (fi 6) (either term, 3-0-0). Classical and quantum statistics; fermions; bosons; molecular structure and spectra; molecular bonding; vibrational and rotational states; absorption; stimulated emission; population inversion; lasers; solid state physics; crystal structure; free-electron gas in metals; band theory of solids; semiconductors; semiconductor devices; superconductivity. Prerequisites: PHYS 208 or 271; MATH 115 or 101 or 118 or SCI 100. Note: Not available for credit towards Honours Physics and Mathematical Physics degree programs. Offered alternate years only. Consult Department for course scheduling.

### PHYS 310 Thermodynamics and Kinetic Theory

★3 (fi 6) (either term, 3-0-0). Temperature: heat, work, and the first law of thermodynamics; entropy and the second law, enthalpy, Helmholtz and Gibbs free energy; thermodynamic equilibrium criteria; Maxwell's relations, phase transitions; elementary kinetic theory of gases. Prerequisite: PHYS 126 or 146 or EN PH 131. Pre- or corequisite: MATH 209 or 215 or 317 or equivalent. Note: Credit will be given for only one of PHYS 211 or 310.

### PHYS 311 Statistical Physics

★3 (fi 6) (either term, 3-0-0). Quantum states, probability distributions, temperature and entropy; canonical ensemble and the partition function; ideal gases, paramagnets; blackbody radiation. Debye model for phonons; quantum statistics; Fermi-Dirac distribution and electrons in metals; Bose-Einstein distribution. Prerequisites: PHYS 211 or 310 (or CH E 243 for Engineering Physics Program students), PHYS 271 and MATH 209 or 215 or 317 or equivalent.

### PHYS 362 Optics and Lasers

★3 (fi 6) (either term, 3-0-0). Gaussian optics; optical instruments; matrix analysis of lens systems; aberrations; polarization; double- and multiple-beam interference; Fraunhofer and Fresnel diffraction; introduction to laser physics and applications; selected topics from contemporary optics. Prerequisite: PHYS 230 or 281, and MATH 209 or 215 or 317.

### PHYS 364 Environmental Physics II

★3 (fi 6) (either term, 3-0-0). Calculation of pollutant concentrations using



principles of materials balance; vertical variation of pressure and temperature in the atmosphere; atmospheric stability and the dispersal of air pollutants; water vapour and humidity; blackbody radiation and Earth's global energy balance; molecular absorption of electromagnetic radiation; the ozone problem; the radon problem. Prerequisites: PHYS 261, and MATH 115 or 101 or 118 or SCI 100. Offered alternate years only. Consult Department for course scheduling.

#### **PHYS 372 Quantum Mechanics A**

★3 (fi 6) (either term, 3-0-0). Origins of quantum mechanics; wave functions; Schrodinger equation and its application to one dimensional systems, postulates and physical interpretation of quantum mechanics; orbital angular momentum, central potentials and three-dimensional systems. Prerequisites: PHYS 271, PHYS 230 or 281, MATH 225 or 227 (or 102), MATH 334 or 201.

#### **PHYS 381 Electromagnetic Theory I**

★3 (fi 6) (either term, 3-0-0). Review of scalar and vector fields; Gauss and Stokes theorems; curvilinear coordinates; Dirac delta function; electrostatic field and potential; electrostatic energy; conductors, capacitors; Laplace's equation; boundary value problems; methods of images; multipoles; electrostatic field in matter; polarization; displacement; linear dielectrics; magnetostatic field; Biot-Savart and Ampere's law; vector potential; magnetostatic field in matter; magnetization; linear and nonlinear magnetic media. Prerequisites: PHYS 230 or 281. Pre- or corequisite: MATH 334 or 201 or equivalent

#### **PHYS 397 Projects in Experimental Physics**

★3 (fi 6) (either term, 0-0-6). Projects in optics, electricity, magnetism, and modern physics. Prerequisite: PHYS 292 or 295 or 297, and PHYS 381. Corequisite MATH 337 or E E 323 or equivalent.

#### **PHYS 400 Industrial Internship Practicum**

★3 (fi 6) (either term, 0-3s-0). Required by all students who have just completed a physics Industrial Internship Program. Must be completed during the first academic term following return to full-time studies. Note: A grade of F to A+ will be determined by the student's job performance as evaluated by the employer, by the student's performance in the completion of an internship practicum report, and by the student's ability to learn from the experiences of the Internship as demonstrated in an oral presentation. Prerequisite: WKEXP 956, 957, or 958.

#### **PHYS 415 Introduction to Condensed Matter Physics I**

★3 (fi 6) (either term, 3-0-0). Lattice structure and binding; lattice vibrations; electrons in solids, band structure of metals, Fermi surface; semiconductors and junctions; paramagnetism and diamagnetism; introduction to lattice defects. Prerequisites: PHYS 311 and 372, and MATH 337 or E E 323 or equivalent.

#### **PHYS 420 Computational Physics**

★3 (fi 6) (either term, 3-0-3). Basic principles; computational methods selected from finite-differences, matrix manipulation, variational techniques, discrete transforms, stochastic methods, lattice techniques; as applied to topics selected from nonlinear mechanics, chaotic systems; electrodynamics; wave propagation; statistical physics; quantum mechanics; condensed matter. Prerequisites: PHYS 234, 244, PHYS 381, MATH 337 or equivalent. Recommended pre- or corequisites: MA PH 343, PHYS 311, PHYS 372, PHYS 472, and PHYS 481. Familiarity with a programming language strongly recommended

#### **PHYS 458 Special and General Relativity**

★3 (fi 6) (either term, 3-0-0). Special Relativity: space-time; Lorentz transformations; definitions of scalars, vectors and tensors; motion of a relativistic particle; energymomentum tensor and equations of motion; transformation of electromagnetic fields. General Relativity: geometry of curved space-time; equivalence principle; gravity as curvature; Einstein equations; black hole and cosmological solutions; gravitational waves. Prerequisites: MATH 337 or E E 323, PHYS 244. Corequisite: PHYS 481.

#### **PHYS 467 Fundamentals of Continuum Mechanics**

★3 (fi 6) (either term, 3-0-0). Cartesian tensors; stress; strain and deformation; Eulerian and Lagrangian descriptions of motions; conservation principles, Cauchy's equation of motion; constitutive relations, elasticity, plasticity, linear and nonlinear viscous fluid flow; elastic wave equation and Navier-Stokes equation; similarity, scaling and nondimensionalisation of governing equations. Applications from geophysics, materials science, oceanography, and atmospheric physics. Pre- or corequisites: MATH 337 or E E 323, PHYS 381.

#### **PHYS 472 Quantum Mechanics B**

★3 (fi 6) (either term, 3-0-0). Review of the postulates of quantum mechanics; quantization of angular momentum; matrix representations, spin and parity; approximation methods; perturbation theory; variational and other methods; applications; scattering theory; systems of identical particles. Prerequisites: PHYS 372, and MATH 337 or E E 323 or equivalent, and MATH 311.

#### **PHYS 481 Electromagnetic Theory II**

★3 (fi 6) (either term, 3-0-0). Electromotive force; Faraday's law; inductance; Maxwell's equations in free space and in matter; electromagnetic potentials; gauges; energy and momentum conservation laws; plane waves in vacuum, in nonconducting and in conducting media; reflection and refraction of electromagnetic waves; dispersion, wave guides; dipole radiation; radiation due to moving charge; radiation reaction. Prerequisite: PHYS 381, MATH 337 or E E 323 or equivalent.

#### **PHYS 485 Introductory Particle Physics**

★3 (fi 6) (either term, 3-0-0). Particles and forces; relativistic kinematics; symmetries and conservation laws; bound states, heavy flavours, and the quark model; Dirac equation and the electrodynamics of leptons; electrodynamics of quarks and the parton model; quantum chromodynamics and the strong interactions; weak interactions and electroweak unification. Prerequisites: PHYS 372; MATH 225 or 227, MATH 337 or equivalent. Recommended: PHYS 458 and PHYS 472.

#### **PHYS 495 Special Topics in Physics**

★3 (fi 6) (either term, 3-0-0). The course covers specialized topics of interest to advanced undergraduate students. Consult the Department for details about current offerings. Prerequisites depend on the subject. Credit for this course may be obtained more than once.

#### **PHYS 499 Special Projects**

★3 (fi 6) (either term, 0-0-6). Experimental or reading project under the direction of a staff member. Prerequisites: A 300-level Physics course and consent of Department. Credit for this course may be obtained more than once.

## Graduate Courses

**Note:** The following undergraduate courses may be taken for credit by graduate students: ASTRO 429, 430, 465; PHYS 415, 420, 472, 481, 485, 499.

#### **PHYS 511 Advanced Quantum Mechanics I**

★3 (fi 6) (first term, 3-0-0). Principles of quantum mechanics; central force problems; angular momentum; approximation methods for stationary states; time-dependent perturbation theory; scattering theory; identical particles and second quantization; quantum statistical mechanics.

#### **PHYS 512 Advanced Quantum Mechanics II**

★3 (fi 6) (second term, 3-0-0). Time-dependent scattering theory; relativistic quantum mechanics; Klein-Gordon and Dirac equations; introduction to quantum field theory.

#### **PHYS 524 Classical Electrodynamics**

★3 (fi 6) (either term, 3-0-0). Wave guides, radiating systems; special relativity, dynamics of relativistic particles and electromagnetic fields; radiation by moving charges; multiple fields. Additional special topics will be discussed.

#### **PHYS 530 Statistical Mechanics**

★3 (fi 6) (either term, 3-0-0). Fundamentals of classical and quantum statistical mechanics, with selected applications.

#### **PHYS 541 Condensed Matter Physics I**

★3 (fi 6) (either term, 3-0-0). Crystal structure and symmetries; electrons and band structure; semiconductors and heterostructures; lattice vibrations and thermal properties.

#### **PHYS 580 Computational Physics**

★3 (fi 6) (either term, 3-0-3). Basic principles; computational methods selected from finite-differences, matrix manipulation, variational techniques, discrete transforms, stochastic methods, lattice techniques; as applied to topics selected from nonlinear mechanics, chaotic systems; electrodynamics; wave propagation; statistical physics; quantum mechanics; condensed matter. Prerequisite: Consent of Instructor.

#### **PHYS 590 Particle Physics II**

★3 (fi 6) (either term, 3-0-0). Field theory and symmetries; gauge theories; spontaneous symmetry breaking; electroweak interactions of quarks and leptons; quantum chromodynamics; unified theories.

#### **PHYS 595 Special Topics in Physics**

★3 (fi 6) (either term, 3-0-0). This course covers specialized topics of interest to junior graduate students. Consult the Department for details about current offerings. Prerequisite: Consent of Instructor. Credit for this course may be obtained more than once.

#### **PHYS 601 Topics in Physics**

★1 (fi 2) (either term, 3-0-0). Covers specialised topics of current interest to graduate students in the Department of Physics. Consult the department for current course offerings. Credit for this course may be obtained more than once.

#### **PHYS 610 Quantum Field Theory I**

★3 (fi 6) (first term, 3-0-0).

#### **PHYS 635 Statistical Theory of Plasmas**

★3 (fi 6) (either term, 3-0-0).

#### **PHYS 646 Special Topics in Condensed State Physics**

★3 (fi 6) (either term, 3-0-0).

#### **PHYS 696 Black Hole Physics**

★3 (fi 6) (either term, 3-0-0).

#### **PHYS 698 Advanced General Relativity**

★3 (fi 6) (either term, 3-0-0).

#### **PHYS 699 Special Topics in Theoretical Physics**

★3 (fi 6) (either term, 3-0-0).

## 231.224 Physiologie, PHYSE

Faculté Saint-Jean

### Cours de 1er cycle

#### PHYSE 152 Physiologie

★6 (fi 12) (aux deux semestres, 5-0-0). Introduction à la physiologie humaine. Doit être complété avant l'année 2 du BSclnf (bilingue). Notes: La priorité sera accordée aux étudiants du BSclnf (bilingue). Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour NURS 150 ou 151.

#### PHYSE 210 Physiologie humaine

★6 (fi 12) (l'un ou l'autre semestre, 6-0-0). Cours d'introduction à la physiologie humaine. Préalables : BIOL 107 ou 108, ★6 de CHIM. Note : Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour PHYSL 210, ou PHYSL 212 et 214.

## 231.225 Physiology, PHYSL

Department of Physiology  
Faculty of Medicine and Dentistry

**Note:** Details on the BSc Program in Physiology can be found in the Faculty of Science section.

### Undergraduate Courses

#### O PHYSL 210 Human Physiology

★6 (fi 12) (two term, 3-0-0). Introductory course in human physiology. Prerequisites: BIOL 107 or 108; plus 6 credits in University level Chemistry. Credit may be obtained in only one of PHYSL 210, or 212 and 214. See PHYSL 212.

#### O PHYSL 212 Human Physiology I

★3 (fi 6) (first term, 3-0-0). An introduction to human physiology. Part 1, covering: membrane transport mechanisms; intracellular and electrical signaling; the physiology of excitable tissues; the physiology of blood; and the cardiovascular system. Required for students in the Physiology Honors program. Recommended for students in other Honors/Specialization programs. Prerequisites: BIOL 107 and 108; CHEM 101 and 102. Pre- or corequisites: CHEM 164 or 261, and 263. Credit may be obtained in only one of PHYSL 212 and 214, or 210. Students with credit in PHYSL 212 and 214, or 210 may not obtain credit in ZOO 241 or 242. See your departmental advisor.

#### O PHYSL 214 Human Physiology II

★3 (fi 6) (second term, 3-0-0). An introduction to human physiology. Part 2, covering: the physiology of the gastrointestinal tract; the respiratory system; the renal system; endocrinology; and the reproductive system. Required for students in the Physiology Honors program. Recommended for students in other Honors/Specialization programs. Prerequisite: PHYSL 212.

#### O PHYSL 372 Systems Neuroscience

★3 (fi 6) (second term, 3-0-0). Introduction to the organization and function of vertebrate nervous systems. Major topics will be neural development, control of movement, integration of sensory information, and the neuronal mechanisms underlying memory and learning. Prerequisites: PHYSL 212 and 214, or 210, or ZOO 242.

#### O PHYSL 400 Reproductive Physiology

★3 (fi 6) (second term, 3-0-0). The aim of this course is to describe (i) the causes of infertility, (ii) therapeutic approaches to restore or enhance fertility and (iii) contraceptive approaches to avoid pregnancy. Prerequisites: PHYSL 212 and 214, or 210 and consent of Department.

#### O PHYSL 401 Molecular and Cellular Physiology

★3 (fi 6) (second term, 3-0-0). The molecular and cellular aspects of physiological processes. Main areas include the structure and functions of plasma membranes (emphasizing transport processes and their regulation) and the mechanism of action of hormones (hormone-receptor interactions, receptor regulation and interactions of intracellular mediators). The physiological significance of these processes will be stressed throughout. Prerequisites: PHYSL 212 and 214, or 210 and consent of Department.

#### O PHYSL 402 Homeostatic Physiology

★3 (fi 6) (second term, 3-0-0). Principles of regulatory mechanisms in human and mammalian physiology. The interrelationships between different organ systems in the maintenance of homeostasis will be discussed. Prerequisites: PHYSL 212 and 214, or 210 and consent of Department. Offered to fourth year students only.

#### O PHYSL 403 Neuroendimmunomodulation

★3 (fi 6) (first term, 3-0-0). The physiological and pathophysiological interrelationships between the nervous, endocrine and immune systems. Prerequisites: PHYSL 212 and 214, or 210 and consent of Department.

#### O PHYSL 404 Cardiovascular Physiology

★3 (fi 6) (first term, 3-0-0). General concepts in human cardiovascular physiology:

properties of the myocardium, hemodynamics and control of the cardiovascular system; limited discussion of relevant clinical situations. Prerequisites: PHYSL 212 and 214, or 210 and consent of Department.

#### O PHYSL 405 Sensory Physiology

★3 (fi 6) (second term, 3-0-0). The sensory systems in human physiology. The topics covered will be vision, hearing, vestibular mechanisms, taste, smell and touch, including receptor mechanisms and central organization. Prerequisites: PHYSL 212 and 214, or 210 and consent of Department.

#### O PHYSL 444 Current Topics in Neuroscience

★3 (fi 6) (first term, 3-0-0). A lecture course emphasizing contemporary aspects of developmental, cellular, systems and cognitive neurophysiology. Topics will include experience-dependent processes in the development of the nervous system, the molecular and cellular mechanisms for learning and memory, and voluntary movement, the representation and transformation of information in the nervous system, and the neuronal events associated with conscious experience. Students will be expected to demonstrate a thorough understanding of selected readings from current and classical literature. Suitable for honors students in Physiology, Pharmacology, Psychology and Neuroscience. Prerequisites: PMCOL 371 and PHYSL 372 and consent of Department.

#### L PHYSL 465 Undergraduate Research Project

★3 (fi 6) (either term, 0-0-6). Individual study. Restricted to students in the Physiology Honors Program. Students will spend one term in the laboratory of a faculty member and carry out a laboratory research project. Successful completion of an oral presentation is required at the conclusion of the project. Credit for this course may be obtained more than once.

#### L PHYSL 466 Undergraduate Tutorial

★3 (fi 6) (either term, 3-0-0). Individual study. Restricted to students in the Physiology Honors Program. Students will select a faculty member who will guide them through a course of reading at an advanced level on a specialized topic. Successful completion of an oral presentation is required at the conclusion of the project. Credit for this course may be obtained more than once.

#### L PHYSL 467 Undergraduate Research Project

★6 (fi 12) (two term, 0-0-6). Individual study. Restricted to students in the Physiology Honors Program. Students will spend two terms in the laboratory of a faculty member and carry out a research project. The student will be required to present an oral overview of the project at the end of the first term and a final oral presentation and a paper in manuscript form at the conclusion of the project.

### Graduate Courses

#### O PHYSL 500 Reproductive Physiology

★3 (fi 6) (second term, 3-0-0). The aim of this course is to describe (i) the causes of infertility, (ii) therapeutic approaches to restore or enhance fertility and (iii) contraceptive approaches to avoid pregnancy. Lectures are the same as PHYSL 400, but with additional assignments and evaluation appropriate to graduate students. Credit cannot be obtained for both PHYSL 400 and 500. Prerequisites: PHYSL 212 and 214, or 210 and consent of Department.

#### L PHYSL 501 Topics in Cardiovascular Physiology

★3 (fi 6) (second term, 3-0-0). The goal of PHYSL 501 is to develop critical appraisal and presentation skills in advanced undergraduate and graduate students. Through critical review of controversial topics in modern cardiovascular physiology, the participant will learn to appreciate that literature is a dynamic, changing and fallible source of information. Presentation skills are developed through both oral and written assignments and facility with the use of electronic library resources is encouraged. Course content varies from year to year. Prerequisites: PHYSL 212 and 214, or 210, 404 and consent of Department.

#### L PHYSL 502 Problems in Current Research

★3 (fi 6) (either term, 0-0-6). Individual study. Credit for this course may be obtained more than once.

#### L PHYSL 506 Tutorial and Seminar Course

★3 (fi 6) (either term, 3-0-0). Guided reading course. Credit for this course may be obtained more than once.

#### O PHYSL 513 Fetal Physiology

★3 (fi 6) (second term, 3-0-0). The course stresses experimental approaches to understanding fetal physiology as well as the development and function of the fetus from ovulation to birth and adaptation to independent life. This course also deals with maternal physiology during pregnancy, complications of pregnancy, and newborn health. Prerequisites: PHYSL 212 and 214, or 210 and consent of Department.

#### O PHYSL 527 Experimental Approaches in Neuroscience

★3 (fi 6) (second term, 3-0-0). Lecture course designed to provide an appreciation and understanding of the vast array of experimental approaches used in neurobiological research. Topics will include electrophysiological, neuropharmacological, and anatomical approaches used to understand how the nervous system functions at the molecular, cellular, and system levels. For advanced undergraduate and graduate students. Prerequisite: PHYSL 372 or PMCOL 371. Offered in alternate years.

**O** **PHYSL 545 Physiology of Transport Systems**

★3 (fi 6) (second term, 3-0-0). A consideration of transport mechanisms primarily from the physiological rather than biochemical viewpoint. Major models considered are the erythrocyte and a variety of epithelia from vertebrates. Designed for advanced undergraduate and graduate students. Offered in alternate years. Prerequisites: PHYSQ 212 and 214, or 210, or ZOOL 241 and 242.

**L** **PHYSL 600 Colloquia in Physiology**

★3 (fi 6) (either term, 0-3s-0). This discussion course will provide an opportunity for Provisional PhD candidates in the Department of Physiology, prior to their candidacy examination, to research, present and critique publications in areas relevant to their research, but not their own research. Graded on a pass/fail basis. Prerequisite: consent of Department. Open to MSc students in the Department of Physiology.

**231.226 Physique, PHYSQ**

Faculté Saint-Jean

**Cours de 1er cycle****PHYSQ 124 Particules et ondes**

★3 (fi 6) (premier semestre, 3-0-3). Cours basé sur l'algèbre, principalement pour les étudiants en sciences de la vie, de la santé et de l'environnement. Le cours décrit deux types de mouvements: la matière (particules) et les ondes. Vecteurs, forces, corps en équilibre, révision de cinématique et dynamique, conservation de la quantité de mouvement et de l'énergie, mouvement circulaire. Vibrations, ondes élastiques dans la matière, son, optique ondulatoire. Radiation du corps noir, photons, ondes de de Broglie. L'accent sera mis sur des applications dans les sciences de la vie, de la santé et de l'environnement. Préalable(s): Physique 20 ou l'équivalent, Mathématiques 30. Physique 30 est fortement recommandé. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour PHYSQ 131, PHYS 144 ou EN PH 131.

**PHYSQ 126 Fluides, champs et radiation**

★3 (fi 6) (deuxième semestre, 3-0-3). Suite de PHYSQ 124, principalement pour les étudiants en sciences de la vie, de la santé et de l'environnement. Statique et dynamique des fluides, gaz, interprétation cinétique. Électrostatique, courants et circuits, champs magnétiques, induction électromagnétique. Radiation nucléaire, son interaction avec la matière et ses applications. Préalable: PHYSQ 124. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour PHYSQ 130, PHYS 146.

**PHYSQ 130 Ondes, optique et son**

★3 (fi 6) (premier semestre, 3-0-3/2). Optique géométrique, instruments d'optique, oscillations, ondes, son, interférence, diffraction. Préalable(s): Mathématiques 30, 31, Physique 30. Concomitant(s): MATHQ 100 ou 113, ou l'équivalent. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour PHYSQ 126, PHYS 146. Les étudiants de la Faculty of Engineering qui suivent ce cours obtiendront ★3.8.

**PHYSQ 131 Mécanique**

★3 (fi 6) (deuxième semestre, 3-1s-3/2). Cinématique et dynamique des particules; gravitation; travail et énergie; moments linéaire et angulaire; systèmes de particules; dynamique des corps rigides. Préalable(s): MATHQ 100 ou 113, PHYSQ 130. Les étudiants de la Faculty of Engineering doivent avoir suivi ENGG 130. Concomitant(s): MATHQ 115 ou MATH 101. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour PHYSQ 124, PHYS 144 ou EN PH 131. Les étudiants de la Faculty of Engineering qui suivent ce cours obtiendront ★4.3.

**PHYSQ 230 Electricité et magnétisme**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-3/2). Champs électriques, loi de Gauss; potentiel électrique; condensateurs et diélectriques; courant électrique et résistance; champs magnétiques; loi d'Ampère; loi de Faraday; inductance; Propriétés magnétiques de la matière. Préalable(s): PHYSQ 130 ou 146 et MATHQ 100. Concomitant(s): MATHQ 101 ou 115. Note: Les étudiants de la Faculty of Engineering qui suivent ce cours obtiendront ★3.8. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour PHYS 281.

**PHYSQ 261 Physique de l'énergie et de l'environnement**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Diverses formes d'énergie; conservation de l'énergie. Principes de thermodynamique; gaz parfaits; transitions de phase; pompes à chaleur et réfrigérateurs. Transfert de chaleur. Consommation de ressources énergétiques. Physique nucléaire; radioactivité; fission, énergie nucléaire. Énergie de remplacement et sources d'énergie renouvelable. Préalables: PHYSQ 126 et MATHQ 113.

**PHYSQ 271 Introduction à la physique moderne**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Contradictions expérimentales de la physique classique: relativité restreinte, quantification de la charge, de la lumière et de l'énergie. Corps noir, effet photoélectrique, effet Compton. Modèles atomiques, propriétés ondulatoires des particules, principe d'incertitude. Equation de Schrödinger, puits carrés infini et fini, oscillateur harmonique, effet tunnel, atome d'hydrogène. Moment cinétique et spin de l'électron, spin et statistique.

Préalable(s): PHYSQ 126 ou 131 ou PHYS 146 et MATHQ 115, 101 ou l'équivalent. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour PHYS 208.

**231.227 Plant Science, PL SC**

Department of Agricultural, Food and Nutritional Science  
Faculty of Agricultural, Life and Environmental Sciences

**Note:** See also Agricultural, Food and Nutritional Science (AFNS), Animal Science (AN SC), Environmental and Conservation Sciences (ENCS), Interdisciplinary (INT D), Nutrition (NUTR), Nutrition and Food Sciences (NU FS), Renewable Resources (REN R) and Soil Sciences (SOILS) course listings for related courses.

**Undergraduate Courses****O** **PL SC 100 Plants in our Lives**

★3 (fi 6) (second term, 3-0-0). Issues related to the importance of plants in our lives, including global food security, interactions between agriculture and the environment, the role of crops in human and animal nutrition, and the potential development of biofuels, biofibers, biopharmaceutical, and bioindustrial crops. Not available to students with ★60 in Agricultural, Life and Environmental Sciences. This course does not substitute for PL SC 221 in the program core. Prerequisite: Biology 30 recommended.

**O** **PL SC 221 Introduction to Plant Science**

★3 (fi 6) (either term, 3-0-3). Principles of plant science for use in agriculture, forestry and environmental sciences. Emphasis on vascular plants in an applied context. Topics include: plant structure and function; reproduction and development; and diversity and management of vegetation and crops. Credit will only be given for one of REN R 220, ENCS 204, PL SC 220, PL SC 221 or BOT 205. [Offered jointly by the Departments of Agricultural, Food and Nutritional Science and Renewable Resources].

**O** **PL SC 324 Crop Ecophysiology**

★3 (fi 6) (second term, 3-0-3). Study of crop production as influenced by plant-plant and plant-environment interactions, as well as management practices. Topics may include photosynthetic efficiency, growth analysis, competition and facilitation in monocrops and mixtures, response to climate change and environmental stress, use of genetically modified organisms and contrasting world crop production systems. Prerequisite: PL SC 221 or ★3 200-level plant related course. Offered in even-numbered years.

**O** **PL SC 331 Plant Biochemistry I**

★3 (fi 6) (first term, 3-0-0). An introduction to the concepts of biochemistry with an emphasis on the structure, function and metabolism of biological macromolecules. Prerequisite: One of: CHEM 161, 164 or 261.

**O** **PL SC 335 Plant Propagation**

★3 (fi 6) (first term, 3-0-3). Study of the physiological and practical aspects of sexual and asexual plant propagation. Propagation by seed and cuttings, layering, grafting and micropropagation. Offered in even-numbered years. Prerequisite: PL SC 221 or consent of Instructor.

**O** **PL SC 345 Plants for Bioproducts**

★3 (fi 6) (second term, 3-0-0). Agronomy, breeding, biochemistry, biotechnology, and ecological issues related to production of plants for bioproducts. Topics selected from biodiesel, fuel ethanol, biolubricants, bioplastic, platform biochemicals, and starch and protein for nonfood applications. Prerequisite: BIOL 107, PL SC 221 or CHEM 164 (or equivalent).

**O** **PL SC 352 Weeds and Weed Control**

★3 (fi 6) (first term, 3-0-3). Crop-weed relationships, methods of control, herbicide properties and uses, weed identification. Prerequisite: PL SC 221 recommended.

**O** **PL SC 354 Forage Crops**

★3 (fi 6) (second term, 3-0-3). The establishment, management, conservation and utilization of forages. Morphological structure and adaptation of the principal forage grasses and legumes. Prerequisite: PL SC 221 or consent of Instructor.

**O** **PL SC 355 Cereal, Oilseed, and Pulse Crops**

★3 (fi 6) (first term, 3-0-3/2). The role of cereals, oilseeds, and pulse crops in Western Canadian agricultural systems. Their botanical, physiological, agricultural, and market quality characteristics. Prerequisite: PL SC 221 or consent of Instructor.

**O** **PL SC 380 Principles of Plant Pathology**

★3 (fi 6) (first term, 3-0-3). An introduction to plant diseases; the nature of nonparasitic and parasitic causal agents such as air pollutants, temperature, viruses, bacteria, fungi, higher plants and nematodes; principles involved in disease prevention and control. Prerequisite: BIOL 107 recommended.

**O** **PL SC 385 Forest Pathology**

★3 (fi 6) (first term, 3-0-3). An introduction to forest diseases. Lectures and discussions focus on the biology and management of the major types of tree diseases causing economic loss. Labs focus on disease identification. A basic



knowledge of forestry is assumed. The course is intended for students in their third, or preferably fourth, year.

#### PL SC 400 Individual Study

★3 (*fi 6*) (either term, variable). Project or reading course supervised by a Faculty member, requiring preparation of a comprehensive report. Prerequisites: ★60 of university courses or higher and consent of the instructor. Note: may be taken more than once if topic is different.

#### PL SC 465 Principles of Plant Breeding

★3 (*fi 6*) (first term, 3-0-0). Basic principles of crop improvement by plant breeding. Different plant breeding methods and their relationship to the major crop species. Graduate students may not register for credit (see AFNS 565). Credit will only be given for one of AFNS 565 and PL SC 465. Prerequisites: BIOL 207 or consent of instructor and ★3 statistics.

#### PL SC 470 Physiology of Herbicidal Action

★3 (*fi 6*) (first term, 3-0-0). Absorption, translocation, degradation, mechanism of action. Offered in even-numbered years. Prerequisites: PL SC 352 and (BOT 240 or 340).

#### PL SC 481 Diseases of Field and Horticultural Crops

★3 (*fi 6*) (second term, 0-3s-0). Diseases of cereal, oilseed, pulse, forage, vegetable, fruit and ornamental crops. Offered in alternate years commencing in 2002-03. Graduate students may not register for credit (see AFNS 582). Credit will only be given for one of AFNS 582 and PL SC 481. Prerequisite: PL SC 380 or consent of instructor.

#### PL SC 487 Principles of Insect Pest Management

★3 (*fi 6*) (second term, 3-0-3). The principles and practice of integrated insect pest management, with an emphasis on insect control strategies in field, greenhouse, and forage crops in western Canada. Topics include methods for sampling and monitoring, estimating yield losses, developing economic thresholds, and reducing crop losses by integrating management strategies. Prerequisite: ENT 207 or 380 or equivalent.

#### PL SC 491 Biotechnology for Crop Improvement

★3 (*fi 6*) (second term, 3-0-0). The use of biotechnology, including genetic engineering, to improve crop plants. Topics covered will include developing genetically modified organisms (GMOs) with an emphasis on crop plants, the application of specific techniques to improve crop productivity, enhancing nutritional characteristics, phytoremediation and the production of pharmaceuticals and other plant products. Prerequisites: BIOL 207 or (BIOL 107 and PL SC 221). BOT 205 and (BIOCH 200 or PL SC 331) recommended. Credit will only be given for one of BOT 382 or PL SC 491.

#### PL SC 495 Integrated Crop Protection

★3 (*fi 6*) (second term, 0-3s-0). Integrated agronomic, mechanical, biological, and chemical control of insects, disease organisms and weeds that interfere with field crop and horticultural crop production. Graduate students may not register for credit (see AFNS 595). Prerequisites: At least two of ENT 207, PL SC 352 or 380, and the third as a corequisite.

#### PL SC 499 Cropping Systems

★3 (*fi 6*) (first term, 3-0-3). The crop rotations, pest management, nutrient cycling, and economic and ecological sustainability of specific Alberta cropping systems will be examined. The lab will consist of a field tour in which students interact with researchers and agronomists from across Alberta. Classes will be a balance of lectures, integrating agronomic principles within the framework of Alberta cropping systems, and team project work. Field tour begins generally 5 days prior to the start of classes. Prerequisites: PL SC 355 and SOILS 210. PL SC 324, 352 and SOILS 460 recommended. Open to fourth-year students in the Faculty of Agricultural, Life and Environmental Sciences.

## Graduate Courses

### Notes

- 400-level courses in PL SC and ENCS 407 may be taken for credit by graduate students with approval of the student's supervisor or supervisory committee. 300-level courses may be taken for credit by graduate students with approval of the AFNS Graduate Program Committee. (See §174.1.1(1))
- See Agricultural, Food and Nutritional Science (AFNS) listings for related courses.

## 231.228 Polish, POLSH

Department of Modern Languages and Cultural Studies  
Faculty of Arts

### Notes

- The Department reserves the right to place students in the language course appropriate to their level of language skill.
- Placement tests may be administered in order to assess prior background. Students with Polish language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in a more advanced course more suitable to their level of ability.

The most current Course Listing is available on Bear Tracks.

Students seeking to fulfill their Language Other than English requirement may begin at any one appropriate level, but must take the full ★6 in one language.

- The Department will withhold credit if a course is completed which the student is deemed ineligible to take, based on their prior background. For example, 100-level courses are normally restricted to students with little or no prior knowledge in that language. Should a student with matriculation standing, or those possessing prior background (such as native speakers or those for whom it is their first language) register in the 100-level course, credit may be withheld.
- See also Modern Languages and Cultural Studies (MLCS) and Slavic and East European Studies (SLAV) listings, and INT D courses offered by the Faculty of Arts.

## Undergraduate Courses

### POLSH 111 Beginners' Polish I

★3 (*fi 6*) (either term, 5-0-0). Essentials of grammar, reading, pronunciation. Designed to give a working knowledge of the Polish language. Note: not to be taken by students with credit in POLSH 100, or with native or near native proficiency, or with Polish 30 or its equivalents in Canada and other countries

### POLSH 112 Beginners' Polish II

★3 (*fi 6*) (either term, 5-0-0). Prerequisite: POLSH 111 or consent of Department. Note: not to be taken by students with credit in POLSH 100, or with native or near native proficiency, or with Polish 30 or its equivalents in Canada and other countries.

### POLSH 211 Second-Year Polish I

★3 (*fi 6*) (either term, 4-0-0). Intermediate grammar, composition, and oral practice based on selected texts of Polish classical and contemporary literature. Prerequisite: POLSH 112 or consent of Department. Note: not to be taken by students with credit in POLSH 201 or 202.

### POLSH 212 Second-Year Polish II

★3 (*fi 6*) (either term, 4-0-0). A continuation of POLSH 211, with greater emphasis on reading and composition. Prerequisite: POLSH 211. Note: not to be taken by students with credit in POLSH 202.

### POLSH 303 Advanced Polish I

★3 (*fi 6*) (either term, 3-0-0). Films, short literary texts and journalistic prose serve as the basis for composition and discussion. Prerequisite: POLSH 212 or consent of Department.

### POLSH 304 Advanced Polish II

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: POLSH 303 or consent of Department.

### POLSH 407 Business Polish

★3 (*fi 6*) (either term, 3-0-0). Specialized language of business in Polish, especially its managing and marketing aspects. Prerequisite: POLSH 304 or consent of Department. Note: not to be taken by students with credit in POLSH 307.

### POLSH 416 20th-Century Polish Literature

★3 (*fi 6*) (either term, 3-0-0). Principal literary movements with emphasis on contemporary Polish literature, including the post-communist era. Polish literary criticism and literary theory before and after the war. Prerequisite: POLSH 415 or consent of Department. Note: Not open to students with credit in POLSH 412.

### POLSH 443 Polish-English Translation

★3 (*fi 6*) (either term, 3-0-0). Introduction to translation theories and practice as applied to Polish. Exercises in translation of minimal textual units (written and oral) with emphasis on nonliterary texts. Prerequisite: POLSH 212 or consent of Department. Note: Formerly POLSH 441. Not open to students with credit in POLSH 441.

### POLSH 444 English-Polish Translation

★3 (*fi 6*) (either term, 3-0-0). Semantic-syntactic theories of translation and practice. Exercises in translation of written and oral textual units with emphasis on literary and artistic texts. Prerequisite: POLSH 212 or consent of Department. Note: Formerly POLSH 442. Not open to students with credit in POLSH 442.

## 231.229 Political Science, POL S

Department of Political Science  
Faculty of Arts

**Note:** See also INT D 393, a course offered by more than one Department which may be taken as an options or as a course in this discipline.

## Undergraduate Courses

### POL S 101 Introduction to Politics

★3 (*fi 6*) (either term, 3-0-0). An introduction to major political concepts and to the study of politics. Note: Not open to students with credit in POL S 100 or 103.

<https://www.beartracks.ualberta.ca>

**L POL S 210 History of Political Thought**

★6 (*fi 12*) (two term, 3-0-0). An historical and critical survey of the development of political and social philosophy from ancient Greece to the present time, with selected readings from major political writers. Note: This is the core course in the field of political philosophy and the prerequisite for 400-level courses in the field. Prerequisite: POL S 101 or consent of Department.

**L POL S 220 Canadian National Government and Politics**

★6 (*fi 12*) (two term, 3-0-0). The structure and function of the government of Canada, especially of the Commons, Senate, Cabinet System, Civil Service, and the role of political parties. Note: This is the core course in the field of Canadian government and politics and a prerequisite for most 400-level courses in the field. Prerequisite: POL S 101 or consent of Department.

**O POL S 221 Canadian Political Realities**

★3 (*fi 6*) (either term, 3-0-0). This introduction to Canadian politics is designed for students who do not intend to take more senior courses in Canadian politics. It provides an overview of Canadian political development, the key institutions and actors in Canadian politics, and a survey of Canada's most pressing and persistent political challenges. Not open to students with credit in POL S 220.

**O POL S 223 City Government and Politics**

★3 (*fi 6*) (either term, 3-0-0). Selected public policies of city governments and the political and administrative processes through which they are produced. Prerequisite: POL S 101 or consent of Department.

**L POL S 230 Introduction to Comparative Politics: Global North**

★3 (*fi 6*) (either term, 3-0-0). Historical and contemporary comparisons among selected Northern countries. Political institutions, social change, development, and democratization. Note: This is a core course in the field comparative politics and the prerequisite for many 300- and 400-level courses in the field. Not open to students with credit in POL S 200. Prerequisite: POL S 101 or consent of Department.

**L POL S 240 Introduction to Comparative Politics: Global South**

★3 (*fi 6*) (either term, 3-0-0). Historical and contemporary comparisons among selected Southern countries. Political institutions, social change, development, and democratization. Note: This is a core course in the field of comparative politics and the prerequisite for many 300- and 400-level courses in the field. Not open to students with credit in POL S 200. Prerequisite: POL S 101 or consent of Department.

**L POL S 260 International Relations**

★6 (*fi 12*) (two term, 3-0-0). An introduction to contemporary international relations that attempts to develop an understanding of political events at the international level. The course covers the nature of foreign policy, the dynamics of interactions between states, the causes of war, imperialism and the role of non-state actors. Note: This is the core course in the field of international relations and a prerequisite for most 400-level courses in the field. Prerequisite: POL S 101 or consent of Department.

**POL S 266 Politics of Globalization**

★3 (*fi 6*) (either term, 3-0-0). Myths and realities of political, economic, and cultural globalization. Implications for nation-states, communities, citizens, and markets. Not open to students with credit in POL S 110. Prerequisite: POL S 101 or consent of Department.

**POL S 299 Citizenship for Democracy**

★3 (*fi 6*) (either term, 3-0-0). Power, politics and political activism. Approaches to participatory and democratic citizenship.

**POL S 302 Topics in Political Thought**

★3 (*fi 6*) (either term, 3-0-0). A variable content course, which may be repeated if topics vary. Prerequisite: POL S 210 or consent of Department.

**POL S 315 Analysis of Political Science**

★6 (*fi 12*) (two term, 3-0-0). A philosophical investigation of the basic issues involved in the scientific study of politics. Prerequisite: POL S 210 or consent of Department. Formerly POL S 313 and 314.

**POL S 321 The Politics of Health Care in Canada I**

★1.5 (*fi 3*) (either term, 18 hours). The development of Canada's health care system, its legislative and philosophical grounds, as well as financing and delivery. Note: Open only to students in the Faculty of Nursing. Not open to students with credit in SC PO 320.

**POL S 322 The Politics of Health Care in Canada II**

★1.5 (*fi 3*) (either term, 18 hours). Current stresses in the health care system such as challenges to universality; alternative health delivery system from a comparative perspective. Note: Open only to students in the Faculty of Nursing. Not open to students with credit in SC PO 320. Prerequisite: POL S 321.

**POL S 324 Topics in Canadian Politics**

★3 (*fi 6*) (either term, 3-0-0). A variable content course, which may be repeated if topics vary. Prerequisite: POL S 220 or consent of Department.

**POL S 325 Canadian Political Economy**

★3 (*fi 6*) (either term, 3-0-0). This course explores the political economy tradition in

Canada, which emphasizes the historical interrelationships among the international political economy, Canadian public policy, political conflict and political movements. Prerequisite: POL S 220 or consent of the Department.

**POL S 327 Aboriginal Peoples and Politics in Canada**

★3 (*fi 6*) (either term, 3-0-0). This course is an examination of different historical and contemporary issues associated with Aboriginal politics. Prerequisite: One of POL S 220, NS 210, or 211.

**POL S 328 Managing Modern Government**

★3 (*fi 6*) (either term, 3-0-0). Topics include government organization and administration, budgets, policy making, and democratic control and accountability. The focus is on Canada, but other countries are also considered. Prerequisite: POL S 220 or 230 or consent of Department.

**POL S 332 Introduction to United States Politics and Government**

★3 (*fi 6*) (either term, 3-0-0). The actors, institutions, and processes of American politics and governance, and the forces that influence them. Prerequisite: Any of the 200-level POL S core courses or consent of Department.

**POL S 333 Ecology and Politics**

★3 (*fi 6*) (either term, 3-0-0). This course examines different approaches to understanding the links between politics, society and ecology. Prerequisites: POL S 230 or 240 or consent of Department.

**POL S 334 North American Politics**

★3 (*fi 6*) (either term, 3-0-0). Comparative study of political institutions of Canada, Mexico, and the United States, and their interaction with NAFTA. Prerequisite: POL S 230 or 240 or 260 or consent of Department.

**POL S 345 Topics in Globalization and Governance**

★3 (*fi 6*) (either term, 3-0-0). A variable content course, which may be repeated if topics vary. Prerequisite: POL S 230 or 240 or 260 or consent of Department.

**POL S 350 The Politics of Gender**

★3 (*fi 6*) (either term, 3-0-0). Relationships between gender, politics and power. From ballot box to bedroom to boardroom, how political and social institutions shape and are shaped by the categories of gender and sex. Prerequisite: Any of the 200-level POL S core courses or consent of Department.

**POL S 354 Topics in Comparative Politics**

★3 (*fi 6*) (either term, 3-0-0). The focus of this course changes yearly to reflect current issues in comparative politics and faculty research interests. Information about the specific topics can be obtained from the Department. A variable content course, which may be repeated if topics vary. Prerequisite: POL S 230 or 240 or consent of Department.

**POL S 357 The Third World in Global Politics**

★3 (*fi 6*) (either term, 3-0-0). Explores the opportunities and constraints imposed on third world governments in an era of globalization and trade liberalization. Of particular interest are the politics of African and South American countries. Prerequisite: POL S 240 or 260 or consent of Department.

**POL S 359 Topics in International Politics**

★3 (*fi 6*) (either term, 3-0-0). This course examines contemporary controversies in international politics. Information about specific topics are available from the Department. A variable content course, which may be repeated if topics vary. Prerequisite: POL S 260 or consent of Department.

**POL S 364 Introduction to International Political Economy**

★3 (*fi 6*) (either term, 3-0-0). This course provides an introduction to the ideas, institutions, and forces which are shaping the new international political economy. It examines the politics of trading blocks such as NAFTA and the EU, North-South relations, and the interactions of markets and states in the global economy. Prerequisite: POL S 230 or 240 or 260.

**POL S 365 Canadian Foreign Policy**

★3 (*fi 6*) (either term, 3-0-0). Major trends and developments in Canadian foreign policy since 1945. Prerequisite: POL S 260.

**POL S 370 Politics of the European Union**

★3 (*fi 6*) (either term, 3-0-0). An examination of European Union institutions, processes, politics, and policy issues. Prerequisite: POL S 230 or 240 or 260 or consent of Department.

**POL S 374 Politics and Society of Postcolonial Africa**

★3 (*fi 6*) (either term, 3-0-0). An intensive survey of selected African politics and societies from colonialism to globalization. Prerequisite: POL S 240 or MEAS major/minor or consent of Department.

**POL S 375 Politics of East Asia**

★3 (*fi 6*) (either term, 3-0-0). A comprehensive introduction to East Asian politics in the postwar period, covering Greater China (Mainland, Taiwan and Hong Kong), Japan and the two Koreas. Prerequisite: POL S 240 or East Asian Studies Major/Minor or consent of Department.

**POL S 376 Topics in Development Studies**

★3 (*fi 6*) (either term, 3-0-0). This course examines the politics of development, focusing specifically on Latin America, Africa, and Asia. It reviews various approaches

to development undertaken by national governments and international agencies such as the United Nations, the World Bank and the International Monetary Fund as well as alternative models advanced by popular political movements. Issues of democratization, ecology, gender equality, and the rights of indigenous peoples also are examined. A variable content course, which may be repeated if topics vary. Prerequisite: POL S 240 or consent of Department.

**POL S 379 Latin American Politics and Society**

★3 (fi 6) (either term, 3-0-0). An intermediate survey of Latin American politics and society. Prerequisite: POL S 240 or consent of Department.

**POL S 380 Politics in the Middle East**

★3 (fi 6) (either term, 3-0-0). Evolution, future, and global significance of Middle Eastern regional politics. Prerequisite: POL S 240 or consent of Department.

**POL S 385 Regional Politics in Western Canada**

★3 (fi 6) (either term, 3-0-0). Political issues, including rural impacts of globalization, urbanization, economic diversification, First Nations' aspirations, government downsizing. Prerequisite: POL S 220 or consent of Department.

**POL S 390 Law and Politics**

★3 (fi 6) (either term, 3-0-0). Relationships between law and politics in Canada and the United States including dispute resolution, societal and governmental influences on the judiciary, the policy-making role of courts, and the criminal process. Prerequisite: POL S 220 or 230 or 332 or consent of Department.

**POL S 391 Canadian Political Parties**

★3 (fi 6) (either term, 3-0-0). Topics include party systems; ideologies and programs, members and supporters, organization and resources, and electoral and governmental activities. Prerequisite: POL S 220 or consent of Department.

**POL S 396 Human Rights and World Politics**

★3 (fi 6) (either term, 3-0-0). This course examines the evolution of the concept of human rights and the current debates on related issues in world politics. Prerequisite: POL S 230 or 240 or 260 or consent of Department.

**POL S 399 Third-Year Honors Seminar**

★3 (fi 6) (second term, 0-3s-0). Research design and research methods for Political Science Honors Students. Note: Restricted to Honors Students in Third Year or those with consent of Department.

**POL S 404 Topics in Political Philosophy**

★3 (fi 6) (either term, 0-3s-0). A variable content course, which may be repeated if topics vary. Prerequisite: POL S 210 or equivalent.

**POL S 405 Democratic Theory**

★3 (fi 6) (either term, 0-3s-0). An investigation of different conceptions of democracy in political thought. Prerequisite: POL S 210 or consent of Department.

**POL S 406 Topics in the History of Political Philosophy**

★3 (fi 6) (either term, 0-3s-0). A variable content course, which may be repeated if topics vary. Prerequisite: POL S 210 or equivalent.

**POL S 410 Topics in Contemporary Political Philosophy**

★3 (fi 6) (either term, 0-3s-0). A critical examination of contemporary trends in political philosophy. A variable content course, which may be repeated if topics vary. Prerequisite: POL S 210 or equivalent.

**POL S 415 Marx and Marxism**

★3 (fi 6) (either term, 0-3s-0). An introduction to Marx's political thought and recent debates in Marxism. Prerequisite: POL S 210 or consent of Department. Not open to students with credit in POL S 305.

**POL S 417 Philosophical Issues of Human Rights**

★3 (fi 6) (either term, 0-3s-0). An enquiry into the idea(s) of human rights and the adequacy of their philosophical grounding. Prerequisite: POL S 210 or consent of Department.

**POL S 419 Politics of the Canadian Constitution**

★3 (fi 6) (either term, 0-3s-0). The political implications of judicial decisions in the areas of civil liberties, federal-provincial relations and international agreements. Prerequisite: POL S 220, or consent of Department.

**POL S 421 Topics in Canadian Politics**

★3 (fi 6) (either term, 0-3s-0). The focus of this seminar changes yearly to reflect current issues in Canadian politics and faculty research interests. Information about the specific topic is available from the department. A variable content course, which may be repeated if topics vary. Prerequisite: POL S 220 or consent of Department.

**POL S 423 Canadian Federalism**

★3 (fi 6) (either term, 0-3s-0). The analysis of the development and theories of Canadian Federalism. Attention will be given to current problems of the federal system. Prerequisite: POL S 220 or consent of Department.

**POL S 429 Government and Politics of Alberta**

★3 (fi 6) (either term, 0-3s-0). The study of selected aspects of Alberta government and politics. Topics may range from political institutions, through political parties, to areas of public policy. Prerequisite: POL S 220 or consent of Department.

**POL S 432 Politics of the Canadian North**

★3 (fi 6) (either term, 0-3s-0). An analysis of the politics of native claims, constitutional change and the non-renewable and renewable resource economics of Canada north of 60 degrees. Prerequisite: POL S 220 or consent of Department.

**POL S 433 City Politics**

★3 (fi 6) (either term, 0-3s-0). The theory and practice of city politics in modern Canada. The course will normally employ as resource persons senior elected and appointed officials from governments. Prerequisite: POL S 223 or permission of the instructor.

**POL S 434 Cities and Globalization**

★3 (fi 6) (either term, 0-3s-0). The global forces shaping urban economies, geographies, and cultures; urban social movements; the privatization of urban space and politics; and shifting conceptions of locality, community, and urbanity. Prerequisite: POL S 220 or 223 or 230 or consent of Department.

**POL S 435 Metropolitan Government**

★3 (fi 6) (either term, 0-3s-0). The comparative study of the political economy of metropolitan government. Prerequisite: POL S 223 or 230 or 240 or consent of Department.

**POL S 437 Politics of Canadian Cultural Industries**

★3 (fi 6) (either term, 0-3s-0). Canadian cultural politics and policy after NAFTA; impacts of trade agreements for cultural industries (publishing, music, television). Prerequisite: POL S 220 or 230 or consent of Department.

**POL S 440 Topics in Canadian Public Policy**

★3 (fi 6) (either term, 0-3s-0). Selected topics of contemporary interest in Canadian public policy. Information about the specific topic is available from the Department. A variable content course, which may be repeated if topics vary. Prerequisite: POL S 220 or consent of Department.

**POL S 441 Gender and Public Policy**

★3 (fi 6) (either term, 0-3s-0). The relationship between gender and public policy in Canada. Of particular concern are effects of restructuring, decentralization, privatization and deregulation on women. Prerequisite: POL S 220 or 350 or consent of Department.

**POL S 442 The Canadian State and Identity Politics**

★3 (fi 6) (either term, 0-3s-0). The relative power, impact and interconnections of both territorial (regional) divisions and other non-territorial divisions (e.g. gender, race, ethnicity, and class). Prerequisite: POL S 220 or consent of Instructor.

**POL S 443 Globalization, Ethnic Politics and the Nation-State**

★3 (fi 6) (either term, 0-3s-0). Theories of nationalism and the nation-state in an era of globalization. Prerequisite: POL S 230 or 240 or consent of Department.

**POL S 444 Global Critical Race Theory**

★3 (fi 6) (either term, 0-3s-0). Politics of race, racialisation and anti-racism in international and comparative perspective. Prerequisite: POL S 230, 240 or 260.

**POL S 445 Topics in Globalization and Governance**

★3 (fi 6) (either term, 0-3s-0). A variable content course, which may be repeated if topics vary. Prerequisite: POL S 230 or 240 or 260 or consent of Department.

**POL S 446 Nation-States in the New International Political Economy**

★3 (fi 6) (either term, 0-3s-0). Pressures faced by nation-states in the new international political economy, especially in relation to macro-economic politics, national sovereignty, economic development, and democratic processes. Prerequisite: POL S 230 or 240 or 260 or consent of Department.

**POL S 450 Topics in Comparative Theory**

★3 (fi 6) (either term, 0-3s-0). Seminar in major areas of comparative theory such as political economy and the politics of collective action. A variable content course, which may be repeated if topics vary. Prerequisite: POL S 230 or 240 or consent of Department.

**POL S 454 Feminism and Social Change**

★3 (fi 6) (either term, 0-3s-0). This course looks at the interaction between feminism(s) and a variety of areas of social theory. A background in feminist theory is recommended. Topics may include: psychoanalysis, sociology, political economy, epistemology, social science methodology, cultural theory, and comparative development. Prerequisites: POL S 230 or 240 or 350 or consent of Department.

**POL S 455 Topics in Gender and Politics**

★3 (fi 6) (either term, 0-3s-0). A variable content course, which may be repeated if topics vary. Prerequisite: Any of the POL S 200-level core courses or consent of Department.

**POL S 457 Foreign Policy Analysis**

★3 (fi 6) (either term, 0-3s-0). Analysis of those main variables contributing to the formation of the foreign policies of selected nations. Prerequisite: POL S 260 or consent of Department.

**POL S 458 United States Foreign Policy**

★3 (fi 6) (either term, 0-3s-0). The contemporary foreign policies of the United States and their causes. Prerequisite: POL S 260 or consent of Department.



**POL S 459 Topics in International Politics**

★3 (fi 6) (either term, 0-3s-0). A variable content course, which may be repeated if topics vary. Prerequisite: POL S 260.

**POL S 460 Global Security**

★3 (fi 6) (either term, 0-3s-0). Historical and contemporary political issues of global security are examined from various theoretical perspectives. Prerequisite: POL S 260 or consent of Department.

**POL S 462 Political Economy of Global Governance**

★3 (fi 6) (either term, 0-3s-0). Competing analytical frameworks within international political economy; social and ideological dimensions of governance in a globalized world. Prerequisite: POL S 364 or consent of Department.

**POL S 468 International Organization**

★3 (fi 6) (either term, 0-3s-0). An examination of theoretical debates on international cooperation and international institutions and their application to contemporary international politics. Prerequisite: POL S 260 or consent of Department.

**POL S 469 Ethics in International Relations**

★3 (fi 6) (either term, 0-3s-0). Sources of and debates on ethical issues in international relations, especially surrounding human rights, economic justice and war. Prerequisite: POL S 260 or consent of Department.

**POL S 470 Topics in Comparative Politics**

★3 (fi 6) (either term, 0-3s-0). Selected topics of current interest in comparative politics and government. A variable content course, which may be repeated if topics vary. Prerequisite: POL S 230 or 240 or consent of Department.

**POL S 474 Topics in African Political Economy**

★3 (fi 6) (either term, 0-3s-0). A variable content course, which may be repeated if topics vary. Prerequisite: POL S 240 or MEAS major/minor or consent of Department.

**POL S 475 Politics of China and Japan**

★3 (fi 6) (either term, 0-3s-0). Domestic politics and foreign policy of China and/or Japan. Note: Not open to students with credit in POL S 473. Prerequisite: POL S 240 or 375 or East Asian Studies major/minor or consent of Department.

**POL S 477 Topics in Islamic Politics**

★3 (fi 6) (either term, 3-0-0). Political ideas and practice in Islamic countries, including historical and contemporary constructions of Islam. A variable content course, which may be repeated if topics vary. Prerequisite: POL S 240 or 380 or consent of Department.

**POL S 478 Topics in Latin American Politics**

★3 (fi 6) (either term, 0-3s-0). A variable content course, which may be repeated if topics vary. Prerequisite: POL S 240 or consent of Department.

**POL S 483 United States Constitutional Law**

★3 (fi 6) (either term, 0-3s-0). Individual liberties and the equal protection of groups in the United States, focusing on court rulings about the Bill of Rights and 14th Amendment, controversies over constitutional interpretation, and the political of rights. Prerequisite: POL S 390 or 419 or consent of Department; also open to Law students.

**POL S 484 Topics in United States Politics and Policy**

★3 (fi 6) (either term, 0-3s-0). A variable content course, which may be repeated if topics vary. Prerequisite: POL S 232 or 332, or consent of Department.

**POL S 486 Topics in European Politics**

★3 (fi 6) (either term, 0-3s-0). Current debates in Europe, including the emergence of new radical right parties, green parties and movements, market liberalization and political change in Eastern and Central Europe, and the resurgence of nationalist discourses. A variable content course, which may be repeated if topics vary. Prerequisite: POL S 230 or consent of Department.

**POL S 487 Topics in European Union Politics**

★3 (fi 6) (either term, 0-3s-0). A variable content course, which may be repeated if topics vary. Prerequisite: POL S 230 or consent of the Department.

**POL S 488 The Politics of Mexico**

★3 (fi 6) (either term, 0-3s-0). Mexico's post-revolutionary politics, its current dynamics, and their continental impacts. Prerequisite: POL S 230 or 240 or consent of Department.

**POL S 499 Honors Essay: Fourth-Year Honors Political Science**

★6 (fi 12) (two term, 0-3s-0). Preparation of the Honors Essay, required in the fourth year of the Honors program. Prerequisite: POL S 399.

**Graduate Courses****Notes**

- (1) See also INT D 593 for a course which are offered by more than one Department or Faculty and which may be taken as options or as a course in this discipline.
- (2) Consent of Department is required for all 500- and 600-level courses.

**POL S 505 Democratic Theory**

★3 (fi 6) (either term, 0-3s-0). An investigation of different conceptions of democracy in political thought. Not open to students with credit in POL S 405.

**POL S 508 Nature of Political Science I**

★3 (fi 6) (either term, 0-3s-0). An examination of the classical (e.g., Aristotelian) conception of political science, and of the modern conception which replaced it (including some of the political and theoretical problems connected with this modern view).

**POL S 509 Nature of Political Science II**

★3 (fi 6) (either term, 0-3s-0). An examination of some particular problems involved in attempting to understand political life (including language and history) scientifically. Prerequisite: POL S 508.

**POL S 514 Topics in Contemporary Political Philosophy**

★3 (fi 6) (either term, 0-3s-0).

**POL S 515 Topics in Political Philosophy**

★3 (fi 6) (either term, 0-3s-0).

**POL S 516 Problems in Marxist Political Theory**

★3 (fi 6) (either term, 3-0-0).

**POL S 517 Philosophical Issues of Human Rights**

★3 (fi 6) (either term, 0-3s-0). An enquiry into the idea(s) of human rights and the adequacy of their philosophical grounding. Not open to students with credit in POL S 417.

**POL S 520 Topics in Canadian Politics**

★3 (fi 6) (either term, 0-3s-0).

**POL S 522 Canadian Federalism**

★3 (fi 6) (either term, 0-3s-0).

**POL S 526 Selected Topics in Urban Politics**

★3 (fi 6) (either term, 0-3s-0).

**POL S 540 Topics in Public Policy**

★3 (fi 6) (either term, 0-3s-0).

**POL S 542 The Canadian State and Identity Politics**

★3 (fi 6) (either term, 0-3s-0). The relative power, impact and interconnections of both territorial (regional) divisions and other non-territorial divisions (e.g., gender, race, ethnicity, and class).

**POL S 543 Globalization, Ethnic Politics and the Nation-State**

★3 (fi 6) (either term, 0-3s-0). Theories of nationalism and the nation-state in an era of globalization.

**POL S 544 Global Critical Race Theory**

★3 (fi 6) (either term, 0-3s-0). Politics of race, racialisation and anti-racism in international and comparative perspective.

**POL S 551 Topics in Comparative Politics: Industrialized Countries**

★3 (fi 6) (either term, 0-3s-0).

**POL S 552 Readings in Comparative Politics: Industrialized Countries**

★3 (fi 6) (either term, 0-3s-0).

**POL S 560 Topics in International Relations**

★3 (fi 6) (either term, 0-3s-0).

**POL S 563 International Security**

★3 (fi 6) (either term, 0-3s-0). A review of analytical approaches to traditional and non-traditional international security issues.

**POL S 565 Topics in Foreign Policy Analysis**

★3 (fi 6) (either term, 0-3s-0). Current approaches to the study of foreign policy that focuses the explanations upon factors within the state.

**POL S 566 Topics in International Political Economy**

★3 (fi 6) (either term, 0-3s-0).

**POL S 571 Topics in Comparative Politics: Comparative Development**

★3 (fi 6) (either term, 0-3s-0).

**POL S 572 Readings in Comparative Politics: Comparative Development**

★3 (fi 6) (either term, 0-3s-0).

**POL S 578 Asian Systems**

★3 (fi 6) (either term, 0-3s-0).

**POL S 580 European Politics**

★3 (fi 6) (either term, 0-3s-0).

**POL S 595 Feminist Theory**

★3 (fi 6) (either term, 0-3s-0). An intensive examination of feminist theory in western political thought, as well as critiques provided by the non-western and post-colonial literatures.

**POL S 596 Topics in Gender and Politics**

★3 (fi 6) (either term, 0-3s-0).

**POL S 598 The Work of Politics**

★3 (fi 6) (either term or Spring/Summer, 0-3L-0). Prerequisite: consent of Department. Participation in an approved internship program including both work experience and academic components. Department approval must be acquired

before initiating the internship. Evaluation will be based on the employer's and internship co-ordinator's or graduate co-ordinator's performance appraisals and will be assessed on a credit/non-credit basis.

**POL S 599 Introduction to the Discipline of Political Science**

★3 (fi 6) (either term, 0-3s-0). An introduction to the professional skills and ethics training expected in Political Science as an academic discipline. POL S 599 is graded on a pass/fail basis.

**POL S 600 Theories and Methods of Comparative Politics**

★3 (fi 6) (either term, 0-3s-0). Traditional and critical perspectives.

**POL S 610 Political Theory**

★3 (fi 6) (either term, 0-3s-0). A review of major thinkers and themes. Core course for PhD students preparing comprehensive exams in political theory.

**POL S 612 Classical Political Philosophy**

★3 (fi 6) (either term, 0-3s-0). Texts selected for doctoral students preparing for comprehensive exams in political philosophy.

**POL S 613 Modern Political Philosophy**

★3 (fi 6) (either term, 0-3s-0). Survey of major works in Western political philosophy.

**POL S 619 Readings in Political Philosophy**

★3 (fi 6) (either term, 0-3s-0).

**POL S 621 Canadian Government and Politics**

★3 (fi 6) (either term, 0-3s-0). The advanced study of politics, government and political science in Canada.

**POL S 622 Contemporary Canadian Political Issues**

★3 (fi 6) (either term, 0-3s-0). Current debates in Canadian politics and public policy.

**POL S 629 Readings in Canadian Politics**

★3 (fi 6) (either term, 0-3s-0).

**POL S 650 Comparative Studies in Industrialized Countries**

★3 (fi 6) (either term, 0-3s-0). A survey of the study of the politics of industrialized countries. Concepts, theories, and analyses of various state and society issues will be examined.

**POL S 660 Theories of International Politics I**

★3 (fi 6) (either term, 0-3s-0). A review and critique of the traditional theories of international politics and their contemporary challenges.

**POL S 661 Theories of International Politics II**

★3 (fi 6) (either term, 0-3s-0). Contemporary and critical approaches to the study of international politics.

**POL S 668 Readings in International Studies**

★3 (fi 6) (either term, 0-3s-0).

**POL S 670 Studies in Comparative Development**

★3 (fi 6) (either term, 0-3s-0). A survey of the critical concepts and theories in development politics.

**POL S 680 Theories and Methods of Political Inquiry**

★3 (fi 6) (either term, 0-3s-0). Required course for PhD students.

**POL S 690 Gender and Politics**

★3 (fi 6) (either term, 0-3s-0). A survey of various theoretical perspectives on gender, ranging from liberal to postmodern, as well as issues and debates in gender research. Also addressed are questions of difference, identity, and conflict arising from, among others, race, class, sexuality, and north-south relations.

**POL S 696 Readings in Gender and Politics**

★3 (fi 6) (either term, 0-3s-0).

**POL S 900 Directed Research Project**

★3 (fi 6) (variable, unassigned).

## 231.230 Portuguese, PORT

Department of Modern Languages and Cultural Studies  
Faculty of Arts

**Notes**

- (1) The Department reserves the right to place students in the language course appropriate to their level of language skill.
- (2) Placement tests may be administered in order to assess prior background. Students with Portuguese language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in a more advanced course more suitable to their level of ability. Students seeking to fulfill their Language Other than English requirement may begin at any one appropriate level, but must take the full ★6 in one language.
- (3) The Department will withhold credit if a course is completed which the student is deemed ineligible to take, based on their prior background. For

example, 100-level courses are normally restricted to students with little or no prior knowledge in that language. Should a student with matriculation standing, or those possessing prior background (such as native speakers or those for whom it is their first language) register in the 100-level course, credit may be withheld.

- (4) Student who have or will attain advanced standing in Spanish equivalent to SPAN 300 are not permitted to claim more than ★6 credit for the study of Portuguese.

## Undergraduate Courses

**0 PORT 111 Beginners' Portuguese I**

★3 (fi 6) (either term, 5-0-0). A basic course for students with no previous knowledge of Portuguese. Note: not to be taken by students with credit in PORT 100, or with native or near native proficiency or with Portuguese 30 or its equivalents in Canada and other countries.

**0 PORT 112 Beginners' Portuguese II**

★3 (fi 6) (either term, 5-0-0). Prerequisite: PORT 111 or consent of Department. Note: not to be taken by students with credit in PORT 100, or with native or near native proficiency or with Portuguese 30 or its equivalents in Canada and other countries.

**0 PORT 211 Intermediate Portuguese I**

★3 (fi 6) (either term, 4-0-0). Intended to consolidate a basic understanding of Portuguese through a systematic grammar review and practice in various language skills. Prerequisite: Portuguese 30 (or equivalent), PORT 112 or SPAN 212 or consent of Department.

**0 PORT 212 Intermediate Portuguese II**

★3 (fi 6) (either term, 4-0-0). Prerequisite: PORT 211 or consent of Department.

**0 PORT 303 Advanced Portuguese I**

★3 (fi 6) (either term, 3-0-0). Further development of language skills and introduction to different forms of cultural expression in the Luso-Brazilian world.

**0 PORT 304 Advanced Portuguese II**

★3 (fi 6) (either term, 3-0-0). Continuation of the study of language and culture at an advanced level.

## 231.231 Postgraduate Dental Education, PGDE

Faculty of Medicine and Dentistry

## Undergraduate Courses

**PGDE 912 Postgraduate Dental Education**

★0 (fi 12) (two term, 52 weeks). This general residency program is one calendar year in length, July 1 through June 30. Six DDS graduates are accepted each year, those accepted primarily being DDS graduates in the year in which they begin the residency. Under the direction of dental specialists and general practitioners, residents will provide care to patients who cannot be seen by undergraduate dental students because of the complexity and/or scope of the required treatment. Through seminar sessions and clinical teaching, the areas of endodontics, periodontics, prosthodontics, oral surgery, dental implants, pediatric dentistry, hospital dentistry, conscious sedation, advanced oral diagnosis and treatment planning, oral medicine, orofacial pain and advanced general dentistry are taught. Residents will also be involved in the University of Alberta Hospital Dental Service, providing clinical treatment to patients during scheduled daytime clinics, evening and weekend emergency walk-in clinics and on -call. An important additional component of this residency program is off site rotations to underserved areas of this province.

## 231.232 Postgraduate Medical Education, PGME

Faculty of Medicine and Dentistry

## Undergraduate Courses

**PGME 901 One-Month Medical Traineeship**

★0 (fi 1) (either term, 4 weeks). This represents a contract period of registration with variable start and end dates for MD graduates who are completing training either as a Resident or as a Fellow. The focus of the traineeship is based upon the area of specialization. Prerequisites: MD degree and approval by the Division of Postgraduate Medical Education.

**PGME 902 Two-Month Medical Traineeship**

★0 (fi 2) (either term, 8 weeks). This represents a contract period of registration with variable start and end dates for MD graduates who are completing training

either as a Resident or as a Fellow. The focus of the traineeship is based upon the area of specialization. Prerequisites: MD degree and approval by the Division of Postgraduate Medical Education.

#### **PGME 903 Three-Month Medical Traineeship**

★0 (fi 3) (either term, 12 weeks). This represents a contract period of registration with variable start and end dates for MD graduates who are completing training either as a Resident or as a Fellow. The focus of the traineeship is based upon the area of specialization. Prerequisites: MD degree and approval by the Division of Postgraduate Medical Education.

#### **PGME 904 Four-Month Medical Traineeship**

★0 (fi 4) (either term, 16 weeks). This represents a contract period of registration with variable start and end dates for MD graduates who are completing training either as a Resident or as a Fellow. The focus of the traineeship is based upon the area of specialization. Prerequisites: MD degree and approval by the Division of Postgraduate Medical Education.

#### **PGME 912 Twelve-Month Medical Traineeship**

★0 (fi 12) (two term, 52 weeks). This represents a contract period of registration with variable start and end dates for MD graduates who are completing training either as a Resident or as a Fellow. The focus of the traineeship is based upon the area of specialization. Prerequisites: MD degree and approval by the Division of Postgraduate Medical Education.

## 231.233 Psychiatry, PSYCI

Department of Psychiatry  
Faculty of Medicine and Dentistry

### Undergraduate Courses

#### **PSYCI 546 Psychiatry Student Internship**

★6 (fi 12) (either term, 6 weeks). Student internship in psychiatry for students registered in the MD program.

### Graduate Courses

#### **PSYCI 511 Biological Aspects of Psychiatry**

★3 (fi 6) (second term, 3-0-0). Lectures and seminars on: classification, description and measurement of psychiatric disorders; sleep disorders; biochemical theories of psychiatric disorders, and discussions of how the actions of the drugs used to treat these disorders relate to these theories; practical aspects of drug treatment; biological markers; brain imaging; women's health issues; herbal products and psychiatry. Prerequisite: Permission of Department.

#### **PSYCI 601 Theory and Practice of Psychiatry**

★3 (fi 6) (either term, 3-0-0). An in-depth analysis of current psychiatric practice in relation to diagnosis, choice of treatment and evaluation of clinical responses. Emphasis will be placed on current research in selected areas of psychiatry. Prerequisite: consent of Department.

#### **PSYCI 602 Advanced Topics in Psychiatry**

★3 (fi 6) (either term, 3-0-0). A discussion of selected topics of current interest in psychiatry including neurobiological and psychosocial aspects of the etiology and treatment of mental disorders. Prerequisite: consent of Department.

#### **PSYCI 603 Psychiatry Tutorial, Research and Reading Course**

★3 (fi 6) (either term, 3-0-0). This course allows a student to study an area of psychiatry in much greater detail than usual. Format is usually a reading/tutorial in which the student carries out directed reading and meets with the tutor regularly. Term papers will be used for evaluation purposes. The course requires independent study. Students who have a particular interest in any specific area in psychiatry are encouraged to meet with Faculty members to explore the possibility of arranging a suitable topic. Prerequisite: consent of Department.

#### **PSYCI 688 Graduate Seminar**

★0 (fi 2) (two term, 0-1s-0). Graduate students in the Department of Psychiatry will be required to attend this weekly seminar series. Each student will be required to present two seminars per two-term period; one related directly to his/her own research, and one on another topic.

## 231.234 Psychologie, PSYCE

Faculté Saint-Jean

### Cours de 1er cycle

#### 231.234.1 Domaine des Arts

##### **PSYCE 105 Comportement social et individuel**

★3 (fi 6) (deuxième semestre, 3-0-1/4). Introduction à l'étude de l'individualité humaine, de la personnalité et des processus sociaux. Le cours peut inclure l'étude

de quelques aspects du développement humain normal et anormal, du jugement et du traitement psychologiques. Préalable(s): PSYCE 104. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

##### **PSYCE 106 Principes psychologiques pour les infirmières**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Principes et processus psychologiques pertinents aux sciences infirmières incluant les devis et l'analyse de la recherche, le développement au cours de la vie, les processus cognitifs et de mémoire, les processus socio-psychologiques, la personnalité, les troubles psychologiques et leur traitement. Notes : La priorité sera accordée aux étudiants du BScln (bilingue). Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour PSYCE 104, 105; PSYCO 104, 105 ou 106.

##### **PSYCE 223 Psychologie de la croissance**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Les aspects biologiques, cognitifs et sociaux du développement psychologique au cours de la petite enfance, de l'enfance et de l'adolescence. Préalable(s): PSYCE 104 et 105 ou l'équivalent.

##### **PSYCE 233 Psychologie de la personnalité**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction aux différentes approches théoriques et à la recherche dans le domaine de la personnalité. Préalable(s): PSYCE 104 et 105 ou l'équivalent.

##### **PSYCE 241 Psychologie sociale**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction aux théories et à la recherche sur l'individu dans un contexte social. Préalable(s): PSYCE 104 et 105 ou l'équivalent. Note: PSYCE 241 et SOC 241 ne peuvent pas être suivis tous les deux pour crédits.

##### **PSYCE 258 Psychologie cognitive**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Une introduction à l'étude des processus cognitifs. Les principaux sujets abordés: la perception, l'attention, la représentation des connaissances, la mémoire, l'apprentissage, le langage, le raisonnement, et la résolution de problèmes. Préalable(s): PSYCE 104 et un parmi STATQ 151 ou SCSOC 322.

##### **PSYCE 339 Psychopathologie**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction générale à l'histoire, à la classification, au diagnostic et au traitement des troubles psychopathologiques. Préalable(s): PSYCE 233.

##### **PSYCE 498 Etude personnelle II**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Cours destiné à permettre aux étudiants au niveau du baccalauréat d'approfondir personnellement un sujet de leur choix. Sous forme de bibliographie dirigée ou de travaux de laboratoire. Préalable(s): l'approbation du Vice-doyen aux affaires académiques.

## 231.234.2 Domaine des Sciences

##### **PSYCE 104 Procédés psychologiques de base**

★3 (fi 6) (premier semestre, 3-0-1/4). Principes et développement de la perception, motivation, apprentissage et réflexion et leur relation avec le fonctionnement psychologique de l'individu. Ce cours est un préalable pour la plupart des cours de psychologie et est normalement suivi de PSYCE 105. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

##### **PSYCE 267 Perception**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Une introduction aux théories et à la recherche dans le domaine de la perception. Préalable(s): PSYCE 104 et un parmi STATQ 151 ou SCSOC 322.

##### **PSYCE 275 Cerveau et comportement**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction à la fonction du cerveau et à son rapport à la sensation, à la perception, au mouvement, à l'apprentissage, à la motivation et à la pensée. Préalable(s): PSYCE 104 et Biologie 30 ou l'équivalent.

##### **PSYCE 281 Principes du changement de comportement**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction aux techniques de changement de comportement. Le cours examinera l'origine de telles techniques dans l'expérimentation sur les animaux et la théorie de l'apprentissage, et fera une évaluation de leur efficacité quand elles sont appliquées aux populations qui ont des problèmes spécifiques. Préalable(s): PSYCE 104.

##### **PSYCE 377 Neuropsychologie humaine**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction à la neuropsychologie et à l'organisation fonctionnelle du cerveau. Dommages cérébraux et leurs effets sur les fonctions mentales, le langage et le comportement moteur. Préalable(s): PSYCE 275.

##### **PSYCE 458 Psychologie avancée de la cognition**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude plus approfondie d'un ou de plusieurs thèmes dans le domaine de la cognition humaine. Préalable(s): PSYCE 258.



**PSYCE 496 Etude personnelle I**

★3 (fi 6) (l'un ou l'autre semestre, 1-0-3). Cours destiné à permettre aux étudiants d'approfondir personnellement un sujet de leur choix (ce que le cadre d'un cours ne permet pas). Prérequis: accord du Vice-doyen aux affaires académiques.

**231.235 Psychology, PSYCO**

Department of Psychology  
Faculties of Art and Sciences

**Undergraduate Courses****231.235.1 Faculty of Arts Courses**

**Note:** Prerequisites to some Arts courses in the Department may be found in the following Science section of this listing.

**L PSYCO 105 Individual and Social Behavior**

★3 (fi 6) (either term, 3-0-1/4). Introduction to the study of human individuality, personality, and social psychological processes. Some aspects of normal and abnormal human development, psychological assessment and treatment may be reviewed. Fulfillment of the ¼ laboratory credit typically entails serving as a research participant but can be fulfilled through the completion of alternative assignments. Prerequisite: PSYCO 104 or SCI 100. [Faculty of Arts]

**L PSYCO 106 Psychological Principles for Nursing**

★3 (fi 6) (second term, 3-0-0). Psychological principles and processes as they relate to training, including research, design and analysis, lifespan development, memory and cognitive processing, social psychological processes, personality, psychological disorders and their treatment. Note: Open only to students enrolled in Nursing. Not open to students with credit in PSYCO 104 or SCI 100, or PSYCO 105. [Faculty of Arts]

**L PSYCO 212 Introduction to Research Methods in Psychology**

★3 (fi 6) (either term, 3-0-0). Experimental and nonexperimental methods in psychology. Topics covered include philosophy of science, measurement, reliability and validity of methods, measures, and effects; experimental quasi-experimental, and single-subject designs; biases in experimentation; and research ethics. Prerequisites: PSYCO 104 or SCI 100, and PSYCO 105, and STAT 141 or 151. [Faculty of Arts]

**L PSYCO 223 Lifespan Developmental Psychology**

★3 (fi 6) (either term, 3-0-0). Introduction to biological, cognitive and social aspects of psychological development. Prerequisites: PSYCO 104 or SCI 100, and PSYCO 105 or equivalent. [Faculty of Arts]

**L PSYCO 233 Personality**

★3 (fi 6) (either term, 3-0-0). An introductory survey including representative theoretical points of view and research relevant to the major problems of the study of personality. Prerequisites: PSYCO 104 or SCI 100, and PSYCO 105 or equivalent. [Faculty of Arts]

**L PSYCO 241 Social Psychology**

★3 (fi 6) (either term, 3-0-0). A survey of theories and research on the individual in a social context. Prerequisites: PSYCO 104 or SCI 100, and PSYCO 105 or equivalent. Note: PSYCO 241 and SOC 241 may not both be taken for credit. [Faculty of Arts]

**L PSYCO 258 Cognitive Psychology**

★3 (fi 6) (either term, 3-0-0). A survey of findings of theoretical issues in the study of cognition, such as perception, attention, knowledge representation, memory, learning, language, reasoning, and problem solving. Prerequisites: PSYCO 104 or SCI 100, and STAT 141 OR 151. [Faculty of Arts]

**PSYCO 300 Honors Seminar I**

★3 (fi 6) (two term, 3-0-0). A range of conceptual and methodological issues in psychology are considered, and students receive intensive training and practice in both written and oral communications. The seminar meets once a week for the full Fall/Winter period. Restricted to, and required of, third-year students in the Arts Honors Psychology program. [Faculty of Arts]

**PSYCO 303 History of Ideas in Psychology**

★3 (fi 6) (either term, 3-0-0). History of psychological thought from ancient times to the recognition of psychology as an academic discipline in the mid -19th century. Prerequisite: PSYCO 104 or SCI 100, PSYCO 105; one 200-level PSYCO offered by the Faculty of Arts; one 200-level PSYCO offered by the Faculty of Science. Note: Not to be taken by students with credit in PSYCO 301. [Faculty of Arts]

**L PSYCO 305 Special Topics in Psychology I**

★3 (fi 6) (either term, 3-0-0). Review and discussion of special topics or methods in one or more of the areas of contemporary psychology such as developmental, social, personality, cognitive. Prerequisites: PSYCO 104 or SCI 100, and PSYCO 105. Note: Consult with the Department for the specific topic offered each year and any additional prerequisites. [Faculty of Arts]

**L PSYCO 323 Infant and Child Development**

★3 (fi 6) (either term, 3-0-0). Biological, Cognitive and social aspects. Prerequisite: PSYCO 223. [Faculty of Arts]

**L PSYCO 325 Applied Research in Developmental Psychology**

★3 (fi 6) (either term, 3-0-0). Relations between research in developmental psychology and practical problems in human development. To gain insights about development, students work with infants, children, or adolescents as volunteers in local agencies and schools. Prerequisites: STAT 141 or 151 and PSYCO 223. [Faculty of Arts]

**L PSYCO 327 Adolescent Development**

★3 (fi 6) (either term, 3-0-0). Biological, cognitive, and social aspects of development that occur during the period from early to late adolescence. Prerequisite: PSYCO 223. [Faculty of Arts]

**L PSYCO 339 Abnormal Psychology**

★3 (fi 6) (either term, 3-0-0). Nature and treatment of psychological disorders, such as cross-disciplinary perspectives and an emphasis on improving understanding of psychopathology in everyday life. Prerequisite: At least one 200-level PSYCO (PSYCO 233 and 275 recommended). [Faculty of Arts]

**L PSYCO 341 Cultural Psychology**

★3 (fi 6) (either term, 3-0-0). An introduction to psychological approaches to the study of culture, including cross-cultural psychology, cultural psychology, indigenous psychologies, and the psychology of ethnicity and intercultural contact. Prerequisites: one of PSYCO 223, 233, or 241. [Faculty of Arts]

**L PSYCO 350 Human Memory**

★3 (fi 6) (either term, 3-0-0). An introduction to the study of human memory. Topics include verbal learning and interference theory, the short-term/long-term memory distinction, semantic memory, working memory, sensory memory, autobiographical memory, amnesia, and implicit memory. The emphasis will be on developing coherent theoretical accounts of the evidence. Prerequisite: PSYCO 258. [Faculty of Arts]

**PSYCO 357 Language Processing**

★3 (fi 6) (either term, 3-0-0). A survey of theories and research on the production and comprehension of spoken and written language. Topics include speech perception, printed word recognition, sentence production and comprehension, discourse processing, reading, language development, and language pathologies. The focus will be on the processing mechanisms implicated by findings in the area. Prerequisite: PSYCO 258. [Faculty of Arts]

**PSYCO 399 Honors Thesis I: Research Apprenticeship**

★3 (fi 6) (two term, 0-0-6). Under the direction of a Faculty member, students pursue a topic of interest leading to the development of a thesis proposal and, during their fourth year, the thesis research. The work normally involves both directed readings and empirical research experience. Restricted to, and required of, third-year students in the Arts Honors Psychology program. [Faculty of Arts]

**PSYCO 400 Honors Seminar II**

★3 (fi 6) (two term, 3-0-0). A continuation of PSYCO 300, with an emphasis on the development of professional skills. Topics include the new information technologies, the publication process, ethical issues, and the application of research findings to real-world problems. The seminar meets once a week for the full Fall/Winter period. Prerequisite: PSYCO 300. Restricted to, and required of, fourth-year students in the Arts Honors Psychology program. [Faculty of Arts]

**L PSYCO 405 Special Topics in Psychology II**

★3 (fi 6) (either term, 3-0-0). Review and discussion of special theoretical or methodological topics, or a novel or emerging research areas in contemporary psychology. Prerequisites: PSYCO 104 or SCI 100, and PSYCO 105, and STAT 141 or 151. Note: Consult with the Department for the specific topic offered each year and any additional prerequisites. [Faculty of Arts]

**PSYCO 411 Cooperative Program Practicum**

★3 (fi 6) (first term, 0-3s-0). Required by all students who have just completed the on-site portion of the Psychology Cooperative Program. The course will involve completion and defense of the practicum report and discussion of related issues. Prerequisites: WKEXP 961, WKEXP 962, and WKEXP 963. [Faculty of Arts]

**L PSYCO 412 Quantitative Methods in Sociocultural Psychology**

★3 (fi 6) (either term, 3-0-2). The assumptions that inform the design of experimental, quasi-experimental, and field studies in sociocultural psychology; the development of scales, questionnaires, and survey instruments, and the coordination of quantitative and qualitative research methods. Prerequisites: PSYCO 212, and one of PSYCO 223, 233, 241, or 341. [Faculty of Arts]

**L PSYCO 415 Qualitative Methods in Sociocultural Psychology**

★3 (fi 6) (either term, 3-0-2). The assumptions that inform the design of qualitative research in sociocultural psychology; the procedures for gathering meaningful information through interviews, conversation, observed interaction, and textual archives; and the analysis of such information. Prerequisites: STAT 141 or 151, and PSYCO 212, and one of PSYCO 223, 233, 241, or 341. [Faculty of Arts]

**L PSYCO 423 Advanced Topics in Developmental Psychology**

★3 (fi 6) (either term, 3-0-0). Prerequisites: STAT 141 or 151 and PSYCO 323

or PSYCO 327. Note: Consult with the Department for the specific topic offered each year and any additional prerequisites. [Faculty of Arts]

**L PSYCO 431 Theory and Practice of Psychometrics**

★3 (fi 6) (either term, 3-0-3). The nature of psychological tests; survey of the various types of standardized tests; some practical work in administration, scoring and interpretation of tests. Prerequisites: STAT 141 or 151 and PSYCO 339. [Faculty of Arts]

**L PSYCO 432 Psychological Studies of Dreaming**

★3 (fi 6) (either term, 3-0-0). An overview of dream studies, including the psychobiology of dreaming, dreaming and cognition, personality and dreaming, therapeutic dream use, and dreams in art and culture. Prerequisites: one of PSYCO 223, 233, 241, or 341. [Faculty of Arts]

**L PSYCO 435 Introduction to Clinical Psychology**

★3 (fi 6) (either term, 3-0-0). The study of the profession of clinical psychology, including topics such as using case studies to examine diagnosis and assessment, judgement and decision making, and psychotherapeutic and community interventions. Prerequisite: PSYCO 339. [Faculty of Arts]

**L PSYCO 436 Psychology of Self-Estrangement**

★3 (fi 6) (either term, 3-0-0). Basic description of self-deception and self-estrangement in psychoanalytic and existential humanistic theories. Discussion of basic determinants of self-deception and, alternatively, self-awareness, as well as considerations of the methods of inquiry appropriate to the area. Prerequisite: PSYCO 339. [Faculty of Arts]

**L PSYCO 443 Social Cognition**

★3 (fi 6) (either term, 3-0-0). Advanced treatment of topics in the study of how we think about the world of persons and events. Topics may include the role of categories, schemas, theories, and heuristics in social cognition, factors underlying the stereotyping of persons and groups, and the question of motivated bias in social perception. Prerequisites: STAT 141 or 151 and PSYCO 241. [Faculty of Arts]

**PSYCO 450 Topics in Memory and Problem Solving**

★3 (fi 6) (either term, 3-0-0). Examines theoretical and empirical issues in human memory and problem solving. Topics include memory representations, real-world memory, memory-based decision making, expert-novice differences in memory and problem solving. Prerequisite: PSYCO 350. [Faculty of Arts]

**PSYCO 490 Honors Thesis II: Thesis Research**

★3 (fi 6) (two term, 0-0-6). Under the direction of a faculty member, students conduct an empirical research project culminating in the Honors Thesis. Prerequisite: PSYCO 399. Restricted to, and required of, fourth-year students in the Arts Honors psychology program. [Faculty of Arts]

**L PSYCO 495 Psychology of Aesthetics**

★3 (fi 6) (either term, 3-0-0). An introduction to the psychological analysis of response to art. Consideration is both theoretical and empirical. Illustrative materials are drawn from several arts, including painting, sculpture and literature. The contribution of aesthetic behavior to personality development is considered. Prerequisites: PSYCO 233 or 241; and a senior level course in C LIT, DES, DRAMA, ENGL, F ST, or MUSIC. [Faculty of Arts]

**PSYCO 498 Individual Study**

★3 (fi 6) (either term, 0-3s-3). A course intended to allow the senior undergraduate student the opportunity to pursue a research topic in greater depth than the classroom structure permits. This pursuit may take the form of directed reading, library research, and/or laboratory experience. A formal paper, research proposal, research report, annotated bibliography, lab notes, and/or essay is required. Cannot be taken more than twice. Prerequisites: A 300-level psychology course and consent of Department. [Faculty of Arts]

## 231.235.2 Faculty of Science Courses

**L PSYCO 104 Basic Psychological Processes**

★3 (fi 6) (either term, 3-0-1/4). Principles and development of perception, motivation, learning, and thinking and their relationship to the psychological functioning of the individual. Fulfillment of the 1/4 laboratory credit typically entails serving as a research participant, but can be fulfilled through the completion of alternative assignments. The course is a prerequisite to all courses in the department and is normally followed by PSYCO 105. [Faculty of Science]

**L PSYCO 267 Perception**

★3 (fi 6) (either term, 3-0-0). An introduction to theoretical and experimental issues associated with sensory and perceptual experience. Prerequisites: PSYCO 104 or SCI 100 and STAT 141 or 151. [Faculty of Science]

**L PSYCO 275 Brain and Behavior**

★3 (fi 6) (either term, 3-0-0). An introduction to brain mechanisms involved in sensation, perception, movement, motivation, learning, and cognition, as studied in both humans and lower animals. Prerequisites: PSYCO 104 or SCI 100 and Biology 30 or equivalent. [Faculty of Science]

**L PSYCO 281 Principles of Behavior**

★3 (fi 6) (either term, 3-0-0). An introduction to behavior change techniques. The

course will examine how contingencies of the environment affect the behavior of organisms. Prerequisite: PSYCO 104 or SCI 100. [Faculty of Science]

**PSYCO 299 Research Opportunity Program in Psychology**

★1.5 (fi 3) (either term, 0-0-3). A credit/no-credit course for supervised participation in a faculty research project. Normally taken after completion of a minimum of ★30 but not more than ★60. Prerequisites: GPA of 2.5 or higher, PSYCO 104 or SCI 100 and one other PSYCO course; and consent of Department. Specific projects may require additional prerequisites. Project and course information available at ROPP website or Department of Psychology. Prospective enrollees in PSYCO 299 must apply to the Department of Psychology. Note: Application does not guarantee an ROPP position. Credit may be obtained twice. [Faculty of Science]

**L PSYCO 302 Special Topics in Psychological Research**

★3 (fi 6) (either term, 3-0-0). Review and discussion of special topics or methods in one or more of the areas of contemporary psychology such as experimental, perception, physiological, learning, memory, behavior, quantitative. Prerequisites: PSYCO 104 or SCI 100 and PSYCO 105 and one 200-level Psychology course. Students must check with the Department for the topics for the year and any additional prerequisites. [Faculty of Science]

**L PSYCO 304 History of Modern Psychology**

★3 (fi 6) (either term, 3-0-0). An overview of the scientific discipline of psychology since the mid 19th century. The focus will be on theories, methods, schools, and professions. Prerequisites: PSYCO 104 or SCI 100 and PSYCO 105; one 200-level PSYCO offered by the Faculty of Arts; one 200-level PSYCO offered by the Faculty of Science. Note: Not to be taken by students with credit in PSYCO 301. [Faculty of Science]

**PSYCO 309 Honors Seminar I**

★3 (fi 6) (two term, 3-0-0). A range of conceptual and methodological issues in psychology are considered, and students receive intensive training and practice in both written and oral communications. The seminar meets once a week for the full Fall/Winter period. Restricted to, and required of, third-year students in the Science Honors Psychology program. [Faculty of Science]

**L PSYCO 354 Foundations of Cognitive Science**

★3 (fi 6) (either term, 3-0-0). An introduction to the theories and research practices of cognitive science by examining contributions of cognitive psychology, artificial intelligence, linguistics, and neuroscience to a variety of research areas. Prerequisites: STAT 141 or 151 and PSYCO 258. [Faculty of Science]

**L PSYCO 356 Research Methods in Cognition**

★3 (fi 6) (either term, 3-0-3). A detailed examination of some of the common methods used for investigating cognitive processes. Topics include response time methods, priming paradigms, tachistoscopic presentation techniques, reading time measurement, and the use of recognition and recall tests. The focus of the course will be on the application of these methods to current theories and issues in cognitive psychology. Laboratories will provide students with first-hand experience at applying these methods to research problems. Prerequisite: PSYCO 258. [Faculty of Science]

**L PSYCO 365 Advanced Perception**

★3 (fi 6) (either term, 3-0-0). Covers the origin and current status of several major problem areas within the study of perception. Topics may include the historical background and knowledge of recent theoretical and experimental contributions required to understand current conceptual schemes and disputes. Prerequisite: PSYCO 267. [Faculty of Science]

**L PSYCO 371 The Neurobiology of Learning and Memory**

★3 (fi 6) (either term, 3-0-0). The aim of this course is to provide students with an introduction to the neural basis of learning and memory. The course begins with a review of the historical background, experimental methods, and principles of neurobiology. Learning and memory are then analyzed at different levels of biological organization, including molecular, cellular, neural circuit, neural system, and behavioral levels. Prerequisite: PSYCO 275. [Faculty of Science]

**L PSYCO 372 Behavior in Relation to Genetics**

★3 (fi 6) (either term, 3-0-0). An examination of the influence of genetic variations on behavioral differences in infra-human and human populations. Prerequisites: PSYCO 104 or SCI 100 and PSYCO 105 and STAT 141 or 151 and BIOL 207. [Faculty of Science]

**PSYCO 375 Introduction to Cognitive Neuroscience**

★3 (fi 6) (either term, 3-0-0). Brain basis of human cognition studied using a diverse range of techniques, with a focus on measures of brain activity such as functional neuroimaging and electrophysiology and on experimental findings in neurologically intact participants. Topics include perception, motor control, attention, memory, language, emotion, and development/aging. Prerequisite: PSYCO 275

**L PSYCO 377 Human Neuropsychology**

★3 (fi 6) (either term, 3-0-0). Brain basis of cognition viewed through the lens of patients with brain damage. Topics include mood, motivation, perception, motor control, attention, memory, language, assessment and rehabilitation. Prerequisite: PSYCO 275. [Faculty of Science]

**L PSYCO 381 Principles of Learning**

★3 (fi 6) (either term, 3-0-0). Principles and processes of learning including a consideration of classical conditioning, instrumental learning, and memory. Research involving non-human animals will be emphasized. Prerequisites: STAT 141 or 151 and PSYCO 281. [Faculty of Science]

**L PSYCO 385 Applications of Learning**

★3 (fi 6) (either term, 3-0-0). An examination of the ways in which principles of conditioning and learning have been applied to areas of human concern. Biomedical and behavioral implications of learning principles will be examined in terms of the empirical foundations of the principles, and the successes or problems encountered in applying the principles to the understanding or treatment of human behavior. Prerequisite: PSYCO 381. [Faculty of Science]

**PSYCO 390 Honors Thesis I: Research Apprenticeship**

★3 (fi 6) (two term, 0-0-6). Under the direction of a Faculty member, students pursue a topic of interest leading to the development of a thesis proposal and, during their fourth year, the thesis research. The work normally involves both directed readings and empirical research experience. Restricted to, and required of, third-year students in the Honors Psychology program. [Faculty of Science]

**PSYCO 391 Evolutionary Theory in Psychology**

★3 (fi 6) (first term, 3-0-0). An introduction to evolutionary psychology; the course will examine the application of evolutionary theory to the field of psychology. Prerequisites: two 200-level PSYCO courses

**L PSYCO 402 Recent Advances in Experimental Psychology: Methods and Phenomena**

★3 (fi 6) (either term, 3-0-2). Discussion and demonstration of the techniques and discoveries of selected fields within experimental psychology. The course will provide laboratory experience with the empirical findings of these fields. Prerequisites: STAT 141 or 151 and a 300-level PSYCO course. Students must check with the Department for the topics for the year and any additional prerequisites. [Faculty of Science]

**L PSYCO 403 Recent Advances in Experimental Psychology: Models and Theories**

★3 (fi 6) (either term, 3-0-0). Discussion of advanced concepts and theories developed by selected fields within experimental psychology. The course will examine the relation between theory and data in these fields. Prerequisites: STAT 141 or 151 and a 300-level PSYCO course. Students must check with the Department for the topics for the year and any additional prerequisites. [Faculty of Science]

**PSYCO 409 Honors Seminar II**

★3 (fi 6) (two term, 3-0-0). A continuation of PSYCO 309, with an emphasis on the development of professional skills. Topics include the new information technologies, the publication process, ethical issues, and the application of research findings to real-world problems. The seminar meets once a week for the full Fall/Winter period. Prerequisite: PSYCO 309. Restricted to, and required of, fourth-year students in the Science Honors Psychology program. [Faculty of Science]

**PSYCO 410 Industrial Internship Practicum**

★3 (fi 6) (first term, 0-3s-0). Required by all students who have just completed the on-site portion of the Science Psychology Industrial Internship Program. The course will involve completion and defence of the practicum report and discussion of related issues. Prerequisites: WKEX 931, 932, and 933. [Faculty of Science]

**L PSYCO 413 Design and Analysis of Experiments in Psychology**

★3 (fi 6) (either term, 3-0-2). Provides the background necessary to design and analyze data in any area of experimental psychology and prepares students to conduct original research. Topics include sampling distributions and hypothesis testing; issues in and analysis of between-subjects, within-subjects, and mixed designs; trend analysis; planned and post hoc comparisons; fixed and random effects factors; and efficiency and power of various experimental designs. Prerequisite: STAT 141 or 151 and any 300-level PSYCO. [Faculty of Science]

**L PSYCO 414 Advanced Methods: Monte Carlo Techniques**

★3 (fi 6) (either term, 3-0-3). A practical introduction to computer simulation based methods of data analysis, including methods for assessing statistical accuracy of measures, performance of statistical tests, and power comparisons. Prerequisites: STAT 141 or 151 and a 300-level PSYCO course. [Faculty of Science]

**PSYCO 452 Minds and Machines**

★3 (fi 6) (either term, 3-0-0). Computational models are playing an increasingly important role in cognitive psychology. The purpose of this course is to provide students with the theoretical background for using such models, as well as some hands-on experience. Students will learn about the history of these models in cognitive psychology, how one might characterize good and bad models, and how cognitive psychologists attempt to experimentally validate their models. Prerequisite: PSYCO 354. [Faculty of Science]

**L PSYCO 458 Advanced Topics in Cognition**

★3 (fi 6) (either term, 3-0-0). In depth examination of one or more topics in cognitive psychology. Topics may include knowledge representation, visual cognition,

memory, learning, decision making, language, reasoning and problem-solving. Prerequisites: one of PSYCO 350, 354, 356, 357, or 365. [Faculty of Science]

**L PSYCO 459 Human Aging: Cognitive Processes**

★3 (fi 6) (either term, 3-0-0). A survey of the sensory, perceptual, memory, and cognitive changes in normal aging. Topics may include the relationship of psychological, environmental, social and health factors to cognitive processes. Prerequisites: PSYCO 258 and a 300-level Psychology course. [Faculty of Science]

**L PSYCO 475 Biological Bases of Behavior**

★3 (fi 6) (either term, 3-0-0). Basic neuroanatomy and neuropsychology of sensory and motor systems. Prerequisite: PSYCO 371 or 377. Students who have obtained credit in NEURO 375 cannot take PSYCO 475 for credit. [Faculty of Science]

**L PSYCO 478 Behavior and Brain Chemistry**

★3 (fi 6) (either term, 3-0-0). The influence of environmental and genetic factors on the relationship between chemistry of the brain and the behavior of humans and animals. Prerequisite: PSYCO 371 or 377. [Faculty of Science]

**L PSYCO 485 Theory in Learning and Comparative Cognition**

★3 (fi 6) (either term, 3-0-0). A theoretical analysis of topics such as Pavlovian conditioning, instrumental learning, working memory, timing, concept learning, and order and numerical competence. Also discussed will be the purposes and nature of theories and the historical development of theory in learning and comparative cognition. Prerequisite: PSYCO 381. [Faculty of Science]

**L PSYCO 486 Advanced Topics in Learning**

★3 (fi 6) (either term, 3-0-0). An in-depth review and analysis of research and issues on specific advanced topics in the area of learning. Prerequisite: PSYCO 381. Students must check with the Department for the topics for the year and any additional prerequisites. [Faculty of Science]

**PSYCO 491 Topics in Evolutionary Theory in Psychology**

★3 (fi 6) (second term, 3-0-0). An in-depth review and analysis of theory and research on specific advanced topics in the field of evolutionary psychology. Prerequisite: PSYCO 391.

**L PSYCO 494 Human Factors and Ergonomics**

★3 (fi 6) (either term, 3-0-0). Scientific knowledge about human behaviours, abilities, limitations, and other characteristics applied to design and use are examined in a range of contexts, from the operation of everyday things to extraordinary systems failures. Prerequisites: A 300-level PSYCO course and consent of the Department. [Faculty of Science]

**PSYCO 496 Individual Research**

★3 (fi 6) (either term, 0-3s-3). A course designed to allow the senior undergraduate student the opportunity to pursue a research topic in greater depth than the classroom structure permits. This pursuit may take the form of directed reading, library research, and/or laboratory experience. A formal paper, research proposal, research report, annotated bibliography, lab notes, and/or essay is required. Cannot be taken more than twice. Prerequisite: A 300-level psychology course and consent of Department. [Faculty of Science]

**PSYCO 499 Honors Thesis II: Thesis Research**

★3 (fi 6) (two term, 0-0-6). Under the direction of a faculty member, students conduct an empirical research project culminating in the Honors Thesis. Prerequisite: PSYCO 390. Restricted to, and required of, fourth-year students in the Science Honors psychology program. [Faculty of Science]

**Graduate Courses****231.235.3 Faculty of Arts Courses****PSYCO 502 Professional and Ethical Issues**

★2 (fi 4) (either term, 3-0-0). [Faculty of Arts]

**PSYCO 541 Advanced Social and Cultural Psychology I**

★3 (fi 6) (either term, 3-0-0). [Faculty of Arts]

**PSYCO 542 Advanced Social and Cultural Psychology II**

★3 (fi 6) (either term, 3-0-0). [Faculty of Arts]

**PSYCO 587 Advanced Abnormal Psychology**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department. [Faculty of Arts]

**PSYCO 600 Individual Studies**

★3 (fi 6) (either term, 3-0-0). [Faculty of Arts]

**PSYCO 622 Topics in Developmental Psychology**

★3 (fi 6) (either term, 3-0-0). [Faculty of Arts]

**231.235.4 Faculty of Science Courses****PSYCO 505 Conference Course in Psychology**

★3 (fi 6) (either term, 3-0-3). [Faculty of Science]



**PSYCO 521 Developmental Concepts and Theories**

★3 (fi 6) (either term, 3-0-0). [Faculty of Science]

**PSYCO 522 Developmental Methods: Design and Data**

★3 (fi 6) (either term, 3-0-0). [Faculty of Science]

**PSYCO 523 Developmental Methods: Application**

★3 (fi 6) (either term, 3-0-0). Prerequisite: PSYCO 522 or permission of Instructor. [Faculty of Science]

**PSYCO 531 Design and Analysis in Psychological Research I**

★3 (fi 6) (first term, 3-0-1). [Faculty of Science]

**PSYCO 532 Design and Analysis in Psychological Research II**

★3 (fi 6) (second term, 3-0-1). Prerequisite: PSYCO 531 or equivalent. [Faculty of Science]

**PSYCO 560 Memory and Cognition**

★3 (fi 6) (either term, 3-0-0). [Faculty of Science]

**PSYCO 561 Advanced Learning and Comparative Cognition**

★3 (fi 6) (either term, 3-0-0). [Faculty of Science]

**PSYCO 574 Advanced Topics in Neuroscience**

★3 (fi 6) (two term, 0-1.5s-0). [Faculty of Science]

**PSYCO 575 Advanced Physiological Psychology**

★3 (fi 6) (either term, 3-0-0). [Faculty of Science]

**PSYCO 576 Cognitive Neuroscience**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department. [Faculty of Science]

**PSYCO 610 Topics in Learning and Comparative Cognition**

★3 (fi 6) (either term, 3-0-0). [Faculty of Science]

**PSYCO 631 Topics in Quantitative Methods**

★3 (fi 6) (either term, 3-0-0). Prerequisite: PSYCO 532 or permission of Instructor. [Faculty of Science]

## 231.236 Public Health Sciences, PHS

Department of Public Health Sciences  
School of Public Health

### Graduate Courses

**O PHS 505 Fundamentals of Public Health**

★3 (fi 6) (first term, 3-0-0). This course provides an overview of the various disciplines making up and impacting on public health. Discussions will cover the Canadian health care system, infectious and chronic disease epidemiology and control, environmental health, occupational health, health care evaluation, disease prevention, health promotion, and disease and exposure assessment.

**PHS 506 Public Health Biology**

★3 (fi 6) (either term, 3-0-0). Provides an understanding of the biology of human health and disease as it affects public health. Normal biochemistry, physiology and immunology of healthy humans. Exploration of mechanisms responsible for genetic, nutritional, infectious, toxic and chronic diseases and their effects on human populations. Factors affecting human health and disease during stages of human development including infancy, youth, reproduction, pregnancy and aging. Examine the basis for current health promotion, disease prevention and control strategies.

**PHS 507 Emergency Preparedness, Planning and Response**

★3 (fi 6) (either term, 0-3s-0). Examines fundamental concepts in emergency preparedness, planning and management practices. Topics disaster epidemiology, natural history of emergencies including weather, war, chemical, biological, radiation and nuclear, rapid epidemiologic assessment, strategy of emergency management including risk and vulnerability analysis, command and control systems, business continuity planning, integrated responses with agencies involved in response operations.

**O PHS 509 Field Practicum**

★6 (fi 12) (Spring/Summer, 16 weeks). Public health practice is an integral part of the MPH degree. The practicum is a full-time hands-on experience in a public health work setting. It provides the opportunity for students to integrate and synthesize public health philosophy, theory and practice through application and critical assessment. Students contribute to a community or organization's capacity to critically assess public health issues, and design, implement and evaluate strategic initiatives, while at the same time gaining confidence and skills as public health professionals. Prerequisites: All required core and specialization courses.

**O PHS 510 Chemistry, Partitioning, and Transformation of Environmental Contaminants**

★3 (fi 6) (either term, 3-0-0). Concepts of chemical and physical properties that determine the transport, partitioning, and degradation of contaminants in the environment will be learned and used to predict environmental fate. The

influence of these processes on human and wildlife exposure scenarios will be explored and students will emerge with a broad understanding of the link between environmental chemistry and health.

**O PHS 511 Environmental Contaminant Exposure Assessment**

★3 (fi 6) (either term, 3-0-0). Principles and practice of monitoring exposure to environmental contaminants, external and internal dose. Biomarkers for environmental contaminant dose estimation. Environmental and biological sampling. Routes of exposure, absorption, and distribution.

**O PHS 512 Environmental Risk Assessment and Management**

★3 (fi 6) (either term, 3-0-0). Concepts of risk to health and environment, assessment, management and communication of risk, hazard identification, links to exposure assessment, toxicology and epidemiology, dose response assessment, risk characterization, regulatory and policy science.

**O PHS 513 Laboratory Research Methods**

★3 (fi 6) (either term, 3-0-0). Theory and practice of laboratory research techniques and methods. Fundamentals and applications of quantitative analysis, separation, atomic spectroscopy, mass spectrometry, PCR and cloning with laboratory experiments. For students who will perform laboratory research.

**PHS 515 Values, Ethics, and Sustainability**

★3 (fi 6) (either term, 3-0-0). Students will gain an appreciation for sustainability and its relevance to social, economic, and biophysical health the world over. Because the integrity of life-supporting ecosystems is essential to human health, well-being and civilization globally, the concept of sustainability is examined in various contexts: individually, collectively, regionally and internationally. The co-dependence of humans and ecosystems for their mutual health is explored and the disconnect between the two is addressed. Thinking outside of the box is critical to finding solutions. Mechanisms for integrating sustainability into various disciplines are explored. The policy significance of major historical declarations in hard and soft law are assessed and used for charting future directions in different professional and social contexts. May contain alternative delivery sections; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar

**O PHS 520 Occupational and Environmental Diseases**

★3 (fi 6) (either term, 0-3s-0). This course is designed to provide students with an overview of the pathophysiology and epidemiology of selected occupational and environmental diseases. Prerequisite: consent of Instructor.

**O PHS 521 Occupational Hygiene**

★3 (fi 6) (either term, 3-0-0). This course is an introduction to occupational hygiene theory, principles, and practice. It covers the recognition, evaluation, and control of common occupational health hazards including chemicals, biological agents, physical agents, and ergonomic issues. The course is not designed to prepare hygienists for practice. Prerequisite: consent of Instructor.

**O PHS 522 Principles of Toxicology**

★3 (fi 6) (either term, 3-0-0). This course is geared to health care professionals who need to understand the basic principles of toxicology, to appreciate the physiological and/or biochemical mechanisms underlying target organ toxicity, and to be able to make initial qualitative risk assessments on the potential toxicity of agents. It will emphasize toxins in the work and home environment. Prerequisite: consent of Instructor.

**PHS 530 Data Analysis in Public Health Sciences**

★3 (fi 6) (either term, 3-0-1). Introduction to data management and analysis. Statistical software for data capture, editing and management; as a basis for the design of research including sample size and power; as well as data presentation, including graphics; to culminate in intermediate level ability to apply a range of statistical analytical techniques. No previous computer experience is needed. Prerequisite: Consent of instructor.

**O PHS 540 Population Health Research Methods: Qualitative and Participatory Approaches**

★3 (fi 6) (either term, 3-0-0). This course will provide the student with a theoretical understanding of qualitative research design. A range of techniques will be discussed, and examples of each examined for strengths, weaknesses and appropriateness. The student will become thoroughly familiar with community-based health research methods through a review of reports, articles and research documents.

**O PHS 542 Case Studies in International Primary Health Care**

★3 (fi 6) (first term, 3-0-0). This introductory course helps students to understand the approaches used by various countries in solving their health and medical problems. Some of the current important issues in international health will be analyzed and discussed, using examples from selected developing countries. The relevance to countries in the developed world (or Canadian context) is also examined. This course introduces interventions to some of the major diseases and health problems in developing countries. Students also become familiar with the role of major international health organizations.

**PHS 543 Health Ethics, Law and Policy**

★3 (fi 6) (either term, 0-3s-0). Students will understand the connections and

distinctions among ethics, law and public policy in health contexts, and should be able to reason critically about legal and policy influences on public health and health care. Several different approaches to ethical analysis are studied, as are brief introductions to policy-making processes and legal principles and structures in Canada. Special attention is paid to justification (rather than mere opinion or imposition) and the limits of ethics, laws and policies to identify or enforce the best practices in health contexts. Several problem areas (e.g. health care system reform, health research, organization and management ethics, human rights and multiculturalism) are examined in light of the theoretical foundations in pursuit of effective and justified health policy.

#### **PHS 545 Measurement in Global Health**

★3 (fi 6) (either term, 3-0-0). An introduction to different measurement methodologies used in Global Health settings including rapid epidemiological assessment, verbal autopsies, focus groups, semi-structured surveys, structured survey designs, and sampling methods. Prerequisite: PHS 640 or consent of instructor.

#### **PHS 550 Introduction to Health Care Finance**

★3 (fi 6) (either term, 3-0-0). Financial structure of the health care system, Introduction to managerial accounting with special emphasis on the management of health care agencies. Principles of costing. Multiproduct and case mix measures. Resource use decisions, budgeting and control, and pricing analysis for health care organizations.

#### **PHS 570 Introduction to Health Care Economics**

★3 (fi 6) (either term, 3-0-0). A survey of health economic theory and empirical studies, topics and areas covered include: (1) demand, supply, and utilization; (2) production and costs (3) resource allocation in health care labor markets; (4) selected facets of health care planning; (5) benefit cost analysis. The empirical studies examined in the course require an understanding of simple and multiple regression techniques.

#### **PHS 580 Management and Design of Health Care Organizations**

★3 (fi 6) (first term, 3-0-0). The purpose of this course is to prepare students to become effective managers and leaders in the health service organizations and health care systems. It facilitates this objective by providing a foundation for the acquisition of the knowledge of the managerial process through an analysis and understanding of the psychological, sociological and political basis of complex social systems, as well as providing a basis for acquiring conceptual and practical skills in the effective management and design of health service organizations and health care networks.

#### **PHS 581 Basics of Public Health Leadership**

★3 (fi 6) (either term, 2-1s-0). This course is intended to provide students with an initial exploration of what leaders actually do, and with an understanding of the basic skill-set necessary for successful leadership on a continuing basis. It is very clear that successful leaders must be able to effectively lead change, particularly in today's fast-paced health environment. As part of this course, you will find yourself quickly developing an understanding of the process of change, the reasons why there is such a range in the quality of change leadership, and your own personal approach to becoming a successful change leader.

#### **PHS 582 Human Resources in Public Health**

★3 (fi 6) (either term, 3-0-0). Develops a basic understanding of human resource trends and issues in public health organizations. Examines topics such as strategic health human resources; organizational effectiveness; healthy work environments; workplace culture; legal and policy frameworks; human resources planning and recruitment; selection, orientation, training, mentoring and career development; performance management and discipline; compensation and benefits; labour relations and collective bargaining; regulated health professionals; and other health human resources policy issues and challenges. Prerequisite: PHS 580 or consent of Instructor.

#### **PHS 583 Whole Systems Approaches to Organizational Change**

★3 (fi 6) (either term, 3-0-0). This course examines the theoretical basis of the whole systems approach to organizational change and the advantages of this approach compared to traditional approaches. It overviews the range of whole systems methodologies available for organizational change initiatives. The course leads to an in-depth knowledge of a number of the whole systems methodologies that will prepare practitioners to make informed decisions regarding their appropriateness for application in specific organizations or organizational situations. It leads finally to an in-depth, hands-on working knowledge (and experience level) with one of the most utilized whole systems methodologies in today's organization development world, i.e., Appreciative Inquiry. Prerequisite: PHS 580 or PHS 581 or consent of Instructor.

#### **PHS 593 Issues in Injury Control**

★3 (fi 6) (either term, 3-0-0). An introductory course that highlights injuries as a major and neglected public health problem. Leading causes of injuries, including motor vehicle, falls, fires, violence, drowning, occupational, and recreational will be addressed in informal lectures and class discussions. The biomechanics of injury and the structure of emergency medical systems will also be covered. Prevention strategies and evaluation of various interventions will be introduced. Prerequisite: consent of Instructor.

#### **PHS 596 Epidemiology Methods I**

★3 (fi 6) (first term, 3-0-0). An introduction to the theory of epidemiology with an emphasis on study design. Topics include the nature of epidemiologic reasoning, indices used to describe and measure health status, evaluation of statistical associations, causation, descriptive studies, analytic studies, intervention studies, bias, confounding, screening and ethics. Students cannot receive credit for both PHS 590 and 596.

#### **PHS 598 Biostatistics I**

★3 (fi 6) (either term, 3-0-1). An introduction to elementary biostatistical methods used to analyze epidemiologic data. Topics will include analysis of 2 x 2 tables, nonparametric methods, linear regression, analysis of variance, direct and indirect standardization, and analysis of censored data. Prerequisite: Introductory statistics course or consent of Instructor.

#### **PHS 600 Health Policy Development**

★3 (fi 6) (second term, 0-3s-0). An overview of the principles and methods underlying the analysis of health policy. Application of health policy principles to selected issues and problems in health policy. Prerequisite: PHS 500 or consent of instructor.

#### **PHS 601 Comparative Health Systems**

★3 (fi 6) (either term, 3-0-0). This course will engage students using a blended learning approach (seminars, on line) with direct involvement of international resource persons in a comparative analysis of the policy framework and health delivery systems in several developed countries. Topics covered include: Organization, Governance and Financing; Economics, Public/Private Models and System Performance; Health Human Resources and Demand/Utilization Management; Primary Health Care; Pharmaceutical Policy; and Public Health Strategies. The course will be of interest to graduate students in public health sciences, business, social sciences and the various health science programs and to policy analysts and managers in the health system. Enrolment is open to students from several Canadian universities.

#### **PHS 602 Engaged Scholarship**

★3 (fi 6) (either term, 0-3s-0). An interdisciplinary seminar intended to prepare students with the knowledge and skills necessary to engage effectively with communities and the health system in research and practice. Students will explore the concepts of engaged scholarship and how these can be best applied in their field of expertise to promote research that is both relevant and of high quality. All PhD students are required to complete this course.

#### **PHS 603 Scientific Communication in Public Health**

★3 (fi 6) (either term, 0-3s-0). An interdisciplinary seminar designed to explore communication in public health including: written and oral communication of research to scientific and lay audiences, grant proposal and manuscript writing, poster and oral presentations. All PhD students are required to complete this course.

#### **PHS 604 Advanced Theory and Research Methods in Public Health**

★3 (fi 6) (either term, 0-3s-0). Exploration of current topics in public health research including: epidemiology, health service delivery, health policy, socio-behavioural approaches, occupational and environmental health. All PhD students are required to complete this course.

#### **PHS 606 Health Law and Administration**

★3 (fi 6) (either term, 3-0-0). The course will introduce students interested in careers in health administration and policy development to relevant issues in health law and risk management in the context of the Canadian legal and public health care systems. It will start with a discussion of the Constitutional foundation of health law in Canada with an analysis of Canada's Federal political structure, Federal and Provincial jurisdictions in health care, and the influence of the Canadian Charter of Rights and Freedoms and the Canada Health Act. It will introduce students to administrative structures and related law. The second part of the course will offer a practical exploration of issues that may confront health managers and policy makers, including medical negligence; informed consent; employment and labour law; contract law (e.g., procurement contracts); public health information; privacy and confidentiality; and regulation of health professions. Students will present papers on special topics in public health law such as infectious disease management, HIV/AIDS, vaccines, tobacco control, food-borne illnesses, intersections with criminal justice, Aboriginal peoples and public health, and genetics and public health.

#### **PHS 630 Health Care Research Methods**

★3 (fi 6) (either term, 3-0-0). An overview of research methods for the health and social sciences fields. Content includes both quantitative and qualitative approaches to theoretical foundations, reliability, validity, research design, sampling, data collection, and data processing. Discussions on survey research, measurement issues, statistical analyses, and current and relevant publications in public health sciences complete this course. Prerequisites: introductory statistics course and consent of Instructor.

#### **PHS 631 Health Program Evaluation**

★3 (fi 6) (either term, 3-0-0). Deals with the application of program evaluation for the health and social sciences fields. Emphasis is on the theory of program

evaluation using various models, research design, and the application of these concepts by performing a program evaluation. Discussions will be centred around the ethics, reliability, validity, process, outcomes, and implications of various program evaluation models. Current and relevant publications in public health sciences complete this course. Prerequisite: PHS 630 or consent of Instructor.

**O PHS 640 Introduction to Global Health**

★3 (fi 6) (first term, 3-0-0). The aim of this course is to enable students to increase their understanding of historical and current determinants of global health and of the interventions to reduce global health inequities.

**O PHS 641 Global Health Project Development**

★3 (fi 6) (first term, 3-0-0). This introductory course to global health project development familiarizes students with the logical frame planning approach. This planning method is a must by many international development agencies, e.g. the Canadian International Development Agency (CIDA), the World Bank and many others. Through various stages of problem analysis, objective analysis and the development of the logical frame with planning indicators and assumptions, course participants learn how to apply this method in the context of a developing country. Prerequisite: Permission of the Instructor.

**PHS 643 Ethics and Health Care Organizations**

★3 (fi 6) (either term, 0-3-0). This interdisciplinary course examines values, dilemmas and ethical decision-making processes in the management of health care teams and facilities. Traditional business practices must be tempered by the ethos of health care in these unique organizations. Topics such as confidentiality of health information in quality assurance exercises, ethics and human resource issues, priorities and allocation decisions, the virtues of leadership, and how to create an ethical climate will be discussed in mixed formats, including lectures, discussions, and student presentations. Skills of ethical attunement, critical reasoning and justification – identifying what is at stake and evaluating the options to navigate the situation – will be central to the course.

**O PHS 671 The Economic Evaluation of Health Care**

★3 (fi 6) (either term, 3-0-0). The application of economic principles to the evaluation of health care practices. The use of various outcome measures. Cost effectiveness and cost benefit analysis.

**O PHS 673 Technology Assessment for Health Care**

★3 (fi 6) (first term, 3-0-0). An overview of the nature, science and practicalities of health technology assessment (HTA), which can then be used as the basis for further work and research. Issues covered will include health care technologies and their management, methods used for assessment, sources of information and application of HTA findings to policy and administrative decisions. Emphasis placed on assessments that have been undertaken by national and regional agencies in Canada and other countries to provide information to governments, health care providers and others. Diagnostic, screening, rehabilitation and information technologies will be considered.

**O PHS 680 Health Care Marketing and Planning**

★3 (fi 6) (second term, 3-0-0). Health care marketing and planning involves the analysis, evaluation, implementation and control of carefully formulated programs designed to bring about voluntary exchanges with a target audience for the purpose of achieving organizational objectives. The purpose of this course is to provide the students with a general understanding of the contribution of marketing and strategic planning to the effective management of health care institutions and public health programs. The course facilitates this objective by providing a foundation for the acquisition of marketing concepts, terms, and skills relevant for understanding the role that marketing and planning play in health care institutions and health systems, the design of health care programs, and as a vehicle for social change.

**PHS 682 Advanced Leadership: Leadership Assessment and the Development of Individual Leadership Strategies**

★3 (fi 6) (either term, 3-0-0). This course is designed to provide self and 360 degree assessment of individual characteristics that influence leadership styles, strategies and outcomes, e.g., emotional intelligence, personality types, learning styles, etc. When the assessments are complete the students will then develop their own leadership strategy that takes into account the findings from the assessments, i.e., develop their own customized leadership strategy that capitalizes on strengths, eliminates or at least minimizes weaknesses, uncovers potential “blind spots” when serving as a leader, and that considers “fit” between person and position. Prerequisite: PHS 582 or consent of instructor.

**O PHS 685 Methods for the Assessment of Health-Related Quality of Life**

★3 (fi 6) (either term, 3-0-0). The primary objective is to provide students with the background knowledge and methodological skills to be discriminating and informed users of health-related quality of life measures and interpreters of HRQL evidence. Topics include uses of HRQL measures, various systems for classifying HRQL measures, methodologies for the assessment of reliability, validity, responsiveness, and interpretability, and conceptualization of major approaches for the development of HRQL measures (including psychometric, clinical, and economics and decision analytic approaches). Examples of different types of measures and their application in a wide variety of clinical areas are included.

**PHS 692 Systematic Reviews**

★3 (fi 6) (second term, 3-0-0). The objective of this course is to provide students with the background knowledge and methodological skills to be discriminating and informed users of systematic reviews. Topics include developing a research question, literature searching, reference management, selection of studies, quality assessment, evidence synthesis (some statistical knowledge required), heterogeneity, and interpretation of the evidence. Students are expected to develop their own question and conduct a systematic review over the course of the term. Prerequisites: PHS 530 and PHS 693, and permission of the Instructor.

**O PHS 693 Critical Appraisal of Health Science Literature in Epidemiology**

★3 (fi 6) (second term, 0-3s-0). Methods for efficiently and critically identifying, appraising, and applying the health sciences literature are learned in an interactive group setting. Topics include studies of prognosis, diagnosis, therapy, causation outcomes research, economic analysis, and systematic reviews. Prerequisite: PHS 590 or consent of Instructor.

**O PHS 695 Epidemiology of Injuries/Design and Evaluation of Injury Interventions**

★3 (fi 6) (either term, 3-0-0). An advanced course focusing on the review of current epidemiologic knowledge of injuries relating to the leading causes of injury, morbidity, and mortality. Strategies for data acquisition and use in injury research will be introduced. Tools will be presented that will allow students to develop the practical skills needed to design, implement, and evaluate injury prevention programs. Prerequisite: PHS 593.

**O PHS 696 Epidemiology Methods II**

★3 (fi 6) (second term, 3-0-0). Epidemiologic methods related to specific study designs and general issues relating to the conduct of epidemiologic studies at an advanced level. Topics covered include confounding, interaction, misclassification, matching, ecologic studies, justification of the odds ratio in case-control studies, and age-period-cohort analysis. Prerequisite: PHS 596 and 598, or consent of Instructor.

**O PHS 697 Epidemiology and Control of Infectious Diseases**

★3 (fi 6) (second term, 3-2s/2-0). This course provides a broad introduction to the knowledge needed to investigate and control infectious diseases. It covers the description, causes and modeling of epidemic and endemic infections, as well as intervention and prevention strategies. Selected infectious diseases are used as case studies. These provide understanding of the natural history, evolution, investigation, methods of control, and the costs and benefits of interventions in a legal and ethical policy context. Prerequisites: PHS 596, and PHS 598, or their equivalent, AND permission of Instructor.

**O PHS 698 Biostatistics II**

★3 (fi 6) (either term, 3-0-0). Advanced biostatistical methods used to analyze epidemiologic data with an emphasis on multivariate regression. Topics include multiple regression, unconditional and conditional logistic regression, proportional hazards regression, and Poisson regression. Prerequisite: PHS 598 or consent of Instructor.

**PHS 699 Use and Analysis of Linked Administrative Health Data**

★3 (fi 6) (Spring/Summer, 3-0-0). Administrative health data have been used widely for decision making and research in Canada and the world. Analysis of these data required knowledge of data features and unique analytical skills since data are not collected for research purposes. This course will help hone students data management and analytical skills to answer research questions using health systems data.

**O PHS 701 Project in Public Health Sciences**

★3 (fi 6) (either term, 0-3s-0). As the culminating educational experience of the MPH degree in public health sciences, students demonstrate the ability to integrate learning acquired through their coursework, including content, methods and practice knowledge. Students are assigned to a small group that functions as a “consulting team” over the course of one academic term to answer a specific question or task for a specific organization that addresses issues of relevance to the field of public health. Designed and supported by public health sciences faculty and external preceptors, capstone projects focus on real public health issues that confront contemporary Canadian public health leaders, require the integration of subject matter across multiple public health disciplines, and call for collaboration, ethical judgment, evaluation and analysis. Prerequisites: All required core and specialization courses, including the field practicum.

**PHS 709 Individual Directed Reading and Research in Health Services Administration**

★3 (fi 6) (either term, 0-3s-0).

**PHS 719 Individual Directed Reading and Research in Environmental Health**

★3 (fi 6) (either term, 0-3s-0).

**PHS 729 Individual Directed Reading and Research in Occupational Health**

★3 (fi 6) (either term, 0-3s-0).



**PHS 749 Individual Directed Reading and Research in Population Health**

★3 (fi 6) (either term, 0-3s-0).

**PHS 798 Biostatistics III**

★3 (fi 6) (either term, 3-0-0). Advanced biostatistical methods for the design and analysis with a special emphasis on applications for health sciences research. Topics include longitudinal and correlated data analysis methods, (including generalized estimating equations and random-effects models), meta analysis advanced survival analysis, ROC-analysis, Bayesian philosophy and statistical evidence, factor analysis, and statistical methods for molecular/genetic epidemiology Prerequisites: PHS 698 or permission of the Instructor.

**PHS 799 Individual Directed Reading and Research in Epidemiology**

★3 (fi 6) (either term, 0-3s-0).

**231.237 Punjabi, PUNJ**

Department of Modern Languages and Cultural Studies  
Faculty of Arts

**Undergraduate Courses****PUNJ 111 Beginners' Punjabi I**

★3 (fi 6) (either term, 5-0-0). Introduction to Punjabi language and culture. Designed for complete beginners of Punjabi. Note: not to be taken by students with native or near native proficiency or any previous instruction in Punjabi.

**PUNJ 112 Beginners' Punjabi II**

★3 (fi 6) (either term, 5-0-0). Continuation of PUNJ 111. Prerequisite: PUNJ 111 or consent of the Department. Note: not to be taken by students with native or near native proficiency. Students who have not taken PUNJ 111 but have some background in Punjabi will be tested the first days of class for eligibility.

**PUNJ 211 Intermediate Punjabi I**

★3 (fi 6) (either term, 4-0-0). Intended to consolidate a basic understanding of Punjabi language and culture through building upon basic language skills acquired in PUNJ 111/112. Prerequisite: PUNJ 112 or consent of Department.

**PUNJ 212 Intermediate Punjabi II**

★3 (fi 6) (either term, 4-0-0). Continuation of PUNJ 211. Prerequisite: PUNJ 211 or consent of the Department.

**231.238 Radiology and Diagnostic Imaging, RADDI**

Department of Radiology and Diagnostic Imaging  
Faculty of Medicine and Dentistry

**Notes**

(1) Undergraduate training in radiology is included in ANAT 411; MED 422, 423, 431; and NEURO 421.

(2) See also Oncological (ONCOL) listing.

**Graduate Courses****RADDI 511 Physics of Diagnostic Imaging: Fundamentals**

★3 (fi 6) (two term, 2-0-1). This course is divided into two main sections: (1) Basic Radiation Physics which deals with nuclear and atomic structure using the Bohr model; Radiation Dose, Risk and Safety from low-level ionizing radiation to Diagnostic Radiology, Radiobiology; and (2) General Radiography: production and clinical use of X-rays; the radiographic image and image parameters; patient radiation/imaging concepts. There will be also a lab component where the student will spend an average of one hour per week in a diagnostic procedure room completing specified imaging tasks/lessons. These labs will not be held at specific times, but will be arranged individually for each student. This course will be offered in alternate years to RADDI 512. Prerequisite or corequisite: PHYS 475/477 or consent of Department.

**RADDI 512 Physics of Diagnostic Imaging: Imaging Modalities**

★3 (fi 6) (two term, 2-0-0). This course will build on the curriculum presented in RADDI 511 and will discuss in detail the physics involved in the following imaging modalities: Fluoroscopy, Conventional Tomography, Digital Techniques (DSA), Computed Tomography (CT), Mammography, Nuclear Medicine, Ultrasound, Magnetic Resonance Imaging (MRI). This course will be offered in alternate years to RADDI 511. Prerequisites or corequisites: RADDI 511, PHYS 475/477 or consent of Department.

**RADDI 521 Physics of Nuclear Medicine Imaging**

★3 (fi 6) (two term, 2-0-0). This course investigates the physics involved in the field of clinical nuclear medicine imaging. Discussion of basic atomic theory (Bohr model), interaction of radiation with matter, radioactive decay, and production of radionuclides will be followed with assessment of radiation detection instrumentation

(geiger counters, ionization detectors, gamma cameras). PET and SPECT performance and image quality parameters will be emphasized, along with NEMA standards for QA and AT. Calculation methodology for Internal Dosimetry will be presented, followed by a discussion of radiobiology. Prerequisite or Corequisites: Normally restricted to students in Radiology and Diagnostic Imaging. This course will also be offered to students, residents and fellows enrolled in the Faculty of Medicine and Dentistry. RADDI 511/512 or consent of the Department.

**RADDI 600 Special Topics in Radiology Research**

★2 (fi 4) (second term, 0-2s-0). A seminar course for advanced students covering selected topics from the current literature in the fields of medical imaging, radiological physics, radiation biology and radiation biophysics.

**231.239 Recreation and Leisure Studies, RLS**

Faculty of Physical Education and Recreation

**Notes**

- (1) See also INT D listings for courses which are offered by more than one department or Faculty and which may be taken as options or as a course in this discipline.
- (2) Priority will be given to recreation students in all recreation courses that are required for the BA (Recreation, Sport, and Tourism) degree program.
- (3) All out-of-Faculty students are recommended to complete RLS 100 in order to take any other recreation course.
- (4) Where an appropriate background can be demonstrated, prerequisites may be waived, with the consent of the Faculty.

**Undergraduate Courses****RLS 100 Life, Leisure, and the Pursuit of Happiness**

★3 (fi 6) (either term, 3-0-0). Examination of the nature, characteristics, and functions of leisure in modern Canada. Review of relationships between leisure and time, play, work, family, education, ethnicity, gender, and environment. Discussion of ideas about conventional leisure, serious leisure, and deviant leisure. Overview of the structure of the Canadian recreation and tourism delivery systems.

**RLS 122 Leadership in Recreation and Leisure Organizations**

★3 (fi 6) (either term, 3-0-1.5). Introduction to leadership and followership as they apply to recreation and leisure organizations. Emphasis is on practical skills including oral and written communication, group dynamics, conflict management, organizational ethics and politics, professional careers, and other topics as relevant.

**RLS 123 Leisure and Human Behavior**

★3 (fi 6) (either term, 3-0-0). A social psychological examination of leisure experiences and leisure behaviors. Focus is on the individual in dynamic interactions with other individuals, groups or cultures within a leisure context. Note: credit will be granted for only one of RLS 123 or 223.

**RLS 210 Recreation and Leisure Scholarship**

★3 (fi 6) (either term, 3-0-0). This course will examine systematic processes of recreation and leisure scholarship. Topics may include the nature of inquiry, paradigmatic questions, quantitative and qualitative methodologies, evaluation and applied research, and other topics as relevant to the areas of recreation and leisure. Prerequisite: RLS 100.

**RLS 225 Program Planning for Leisure**

★3 (fi 6) (either term, 3-0-0). This course involves an examination of the planning process with a particular focus on programming for recreation, sport and tourism. Consideration will be given to program planning for leisure in the context of the not-for-profit, commercial and public sectors. Prerequisite: RLS 100.

**RLS 230 Recreation and Community Development**

★3 (fi 6) (either term, 2-0-1.5). Analysis of the social and political processes through which groups and individuals work to mobilize resources and establish relationships to fulfil community needs. Prerequisite: RLS 100.

**RLS 232 Marketing for Recreation, Sport and Tourism**

★3 (fi 6) (either term, 3-0-0). Marketing is examined from the unique perspectives of recreation, sport and tourism. Emphasis is placed on marketing in the not-for-profit sector although commercial perspectives are also considered. Major topics include market positioning, research, segmentation, product, price, distribution, and promotion. This course will normally include a practicum component. Prerequisite: PERLS 105.

**RLS 263 Principles of Tourism**

★3 (fi 6) (either term, 3-0-0). This course presents an overview and explores the basic principles of the tourism system (tourist, travel, destinations, and marketing), underlying influences such as cultural, social, economic, and psychological aspects, areas of major tourist activity such as natural spaces, constructed facilities, and cultural events, and the impact of tourism upon the attraction, local communities, and national arenas. NOTE: Field Trips are an integral and required component

of this Course. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **RLS 331 Leisure Education**

★3 (*fi 6*) (either term, 3-0-0). A total development process through which individuals develop an understanding of self, leisure, and the relationship of leisure to their own lifestyles and the fabric of society. Examination of determining the place and significance leisure has in one's life. Prerequisite: RLS 100.

#### **RLS 400 Philosophies of Leisure**

★3 (*fi 6*) (either term, 3-0-0). This course examines selected philosophical perspectives related to leisure, recreation, work, play, and quality of life. The course explores the philosophical implications for the recreation profession in Canada and issues related to the future of leisure in Canadian society. Note: Credit will be granted for only one of RLS 300 or 400.

#### **RLS 441 Practicum Seminar**

★3 (*fi 6*) (either term, 0-3s-0). A seminar, taken concurrently with RLS 449, which seeks to relate the professional work experience to the academic and professional preparation elements within the BA program. Students will not be allowed to register in any other course in conjunction with RLS 441/449 unless approved by the Practicum Supervisor.

#### **RLS 444 Issues in Recreation Practice**

★3 (*fi 6*) (either term, 0-3s-0). A seminar for graduating students in Recreation and Leisure Studies centering upon issues relevant to the beginning professional. The seminar seeks to provide a synthesis appropriate to the final-year student. Note: Must be taken in the final term of the student's program.

#### **RLS 449 Professional Practicum**

★12 (*fi 24*) (either term, 14 weeks). Fourteen weeks of professional experience in full-time placement. Must be taken concurrently with RLS 441. Students will not be allowed to register in any other course in conjunction with RLS 441/449 unless approved by the Practicum Supervisor.

#### **RLS 452 Parks Planning, Management, and Maintenance**

★3 (*fi 6*) (either term, 3-0-0). An examination of parks as recreation environments together with an analysis of the relationship between park planning, design and subsequent management and maintenance in terms of meeting the requirements of the park agency, the park user and the resource base. Attention is focused on both the common themes in park management and the specific problems of parks operation and maintenance associated with particular types of parks contained within a comprehensive park system. NOTE: Field Trips are an integral and required component of this course. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisite: RLS 225.

#### **RLS 463 Issues in Tourism Development**

★3 (*fi 6*) (either term, 3-0-0). Critical issues in tourism development will be examined within the context of tourism transformation models and fundamental development concepts such as commodification, authenticity, globalization, sense of place, economic impact, socio-cultural impact and environmental impact. NOTE: Field Trips are an integral and required component of this course. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisite: RLS 263.

#### **RLS 473 Principles and Processes in Therapeutic Recreation**

★3 (*fi 6*) (either term, 2-0-2). The therapeutic recreation programming process is emphasized. Primary focus is on specialized programs in therapeutic recreation settings. The relationship between therapeutic recreation services and recreation and special populations is addressed. Therapeutic recreation service methods, such as systems approach programming, activity analysis, leisure assessment techniques and instruments, as well as treatment approaches and facilitation strategies employed in therapeutic recreation settings are presented. Professional issues such as client rights, standards of practice, and credentialing will also be addressed. Prerequisite: PERLS 207.

#### **RLS 497 Selected Topics in Recreation and Leisure**

★3 (*fi 6*) (either term, variable). Topics of current interest in leisure and recreation. These may vary from year to year. Prerequisite: consent of Faculty.

#### **RLS 499 Directed Studies**

★3 (*fi 6*) (either term, variable). A course designed to meet the needs of individual students. Prerequisite: consent of Faculty.

## Graduate Courses

#### **RLS 510 Concepts and Theories of Leisure and Recreation**

★3 (*fi 6*) (either term, 0-3s-0). Concepts, theories, and perspectives of leisure and recreation are examined in relation to the psychological, sociological, cultural, political, and global significance of leisure. Practical implications will also be explored.

#### **RLS 531 Socio-Psychological Dimensions of Leisure Behaviour**

★3 (*fi 6*) (either term, 0-3s-0). A social psychological examination of leisure

behaviour research and theory, including motivations for, constraints to, experiences during, benefits from, and costs of, leisure.

## 231.240 Rehabilitation Medicine, REHAB

### Faculty of Rehabilitation Medicine

**Note:** Normally all REHAB courses are restricted to students in Rehabilitation Medicine. Students from other faculties require consent of the instructor offering the course.

## Undergraduate Courses

### **REHAB 350 Structural Human Anatomy**

★3 (*fi 6*) (either term, 3-0-0). An in-depth study of the gross anatomy of the upper and lower extremities, trunk, head and neck.

## Graduate Courses

### **REHAB 500 Conducting Rehabilitation Research**

★3 (*fi 6*) (either term, 0-3s-0). Preparation of a plan to conduct research including writing a proposal. Students will discuss critically various aspects, such as the selection of the problem, the review of the literature, the research hypothesis, the collection and analysis of the data, and the significance of the research.

### **REHAB 510 Assistive Technologies in Rehabilitation**

★3 (*fi 6*) (either term, 0-2s-1). A study of assistive technologies used to ameliorate the problems of persons who have disabilities. The integration of assistive technologies into rehabilitation practice is discussed. Assistive technologies for augmentative communication, computer access, sensory (auditory, visual and tactile) assistance, seating and positioning, mobility and manipulation are included. Case studies, interactive demonstrations and review of current literature are provided. Prerequisites: A background in assistive technologies such as provided by OCCTH 312, PTHERR 486 or 490, or SPA 523 or equivalent is recommended. For students without this background, a set of self-study competency modules must be completed during the first few weeks of the term.

### **REHAB 512 Issues in Rehabilitation Science**

★3 (*fi 6*) (either term, 0-3s-0). This course will provide an orientation to the theoretical base and application of Rehabilitation Science.

### **REHAB 535 The Nature of Pain**

★3 (*fi 15*) (either term or Spring/Summer, 3-0-0). Pain is a major factor impacting quality of life and will continue to become more so as the average lifespan increases. Understanding the multi-dimensional nature of pain and its broad impact is critical to applying best practice in its assessment and treatment. The neural pathways/mechanisms subserving normal and pathological pain will be studied in depth as well as a critical view of translating these findings to clinical practice. A range of theoretical perspectives underlying the individual's experience of pain across the continuum from acute to complex/chronic will be presented. The role of interprofessional collaboration for comprehensive pain management will be introduced. (This course is a pre-requisite for REHAB 536 and REHAB 537.)

### **REHAB 536 Assessment and Management of Pain**

★3 (*fi 15*) (either term or Spring/Summer, 3-0-0). Knowledge Translation: Integrating evidence into practice. Building on foundations developed in Rehab 535, this course will present models of and approaches to assessment of and treatment for common pain conditions, across the lifespan, with an emphasis on complex/chronic pain. This course will explore the etiologies of various pain conditions, the prevalence of pain, as well as ethical issues, barriers, and facilitators to comprehensive assessment and treatment. Rationale for pharmacological and non pharmacological interventions will be reviewed. Participants will discuss best practice roles and evidence based roles and interventions for each of the health professionals involved in the collaborative interprofessional management of chronic pain. Prerequisite: REHAB 535.

### **REHAB 537 Integrating and Implementing Pain Management Models**

★3 (*fi 15*) (either term or Spring/Summer, 3-0-0). This course will provide an opportunity for students to integrate and apply information presented in REHAB 535 and 536 using standardized assignments with real and/or simulated patients as a base from which to develop an evidence-based, collaborative, interprofessional, assessment and treatment program of chronic pain and disability. Pre-requisite: REHAB 535, 536.

### **REHAB 540 Stroke Rehabilitation: Best Practice and Critical Review of the Evidence**

★3 (*fi 15*) (either term or Spring/Summer, 3-0-0). This course will focus on current knowledge of best practice in the area of stroke, as well as provide students with critical appraisal skills that will sustain and further the acquisition of best practice information and principles in stroke rehabilitation. This evidence and best practice will be explored in the context of the stroke survivor, caregivers and rehabilitation professionals with students having an opportunity to apply learning to specific professional areas of interest.

**REHAB 541 The Stroke Survivor: Assessment and Rehabilitation across the Continuum of Care**

★3 (*fi 15*) (either term or Spring/Summer, 3-0-0). The goal of this course is to integrate and apply advanced knowledge from REHAB 540 into clinical practice. Using a discovery learning/case study approach, students will conduct an evidence-based review of the literature and work as an interdisciplinary team to apply best practice information to a variety of care contexts. Students will work collaboratively on case studies that offer practical opportunities to apply assessment and treatment principles. Additionally, the course will explore team functioning and dynamics within and across the various stroke rehabilitation settings with students having an opportunity to apply learning to specific professional areas of practice. Prerequisite: REHAB 540.

**REHAB 542 Advancing Practice in Stroke Rehabilitation**

★3 (*fi 15*) (either term or Spring/Summer, 3-0-0). The goal of this course is to develop a proposal that could be implemented into a work environment that incorporates advanced/best practices in stroke rehabilitation. Students will choose a project based on the knowledge gained in the previous courses and on needs that they identify within a practice setting. Students will gain knowledge and experience in organizational change management while working collaboratively with a host site. Students will gain skills in the area they choose for their proposal through tailored mentoring. The mentor will facilitate the process of moving evidence into practice by providing content expertise in implementation of best practice in stroke rehabilitation in a clinical setting. Additionally, this process is expected to provide students with valuable professional contacts. Prerequisite: REHAB 541.

**REHAB 551 Speech Development, Assessment and Treatment Considerations in the Francophone Context**

★3 (*fi 6*) (Spring/Summer, 3-0-0). A study of the characteristics of the French language. The course reviews appropriate assessment tools and treatment models for children and adults with speech disorders. Clinical experience (10 hours) with Francophone clients is included. Restricted to MSc- SLP degree and SLP Certificate students. Prerequisite: REHAB 553. Instruction in French.

**REHAB 552 Language Development, Assessment and Treatment Considerations in the Francophone Context**

★3 (*fi 6*) (Spring/Summer, 3-0-0). A study of the characteristics of the French language. The course reviews appropriate assessment tools and treatment models for children and adults with language disorders. Clinical experience (10 hours) with Francophone clients is included. Restricted to MSc-SLP degree and SLP Certificate students. Prerequisite: REHAB 553. Instruction in French.

**REHAB 553 Linguistic and Cultural Plurality Issues in the Francophone Context**

★3 (*fi 6*) (either term or Spring/Summer, 0-3L-0). A study of linguistic, social and cultural issues that affect treatment of children and adults in plural language (particularly French-English) contexts. SPA 553 is also open to students with a French background from other disciplines such as education, linguistics, psychology, etc., with permission of the Department of Speech Pathology and Audiology. Instruction is in French.

**REHAB 555 Neuroanatomy and Neuroscience for Rehabilitation**

★3 (*fi 6*) (either term, 3-0-0). Structures and functions of the human nervous system and the mechanisms of neural activity and signalling. Emphasis is on integration and function.

**REHAB 568 Statistical Analysis and Interpretation of Research**

★3 (*fi 6*) (either term, 3-0-0). The theory and principles of quantitative and qualitative research design procedures and scientific method. Application to Rehabilitation in practice settings will be explored.

**REHAB 599 Directed Individual Reading and Research**

★3 (*fi 6*) (either term, 0-3s-0). May be repeated. Open to graduate students in Master's and PhD degree programs in the Faculty of Rehabilitation Medicine or any of the other health sciences Faculties who wish to pursue individual reading and research studies with an academic staff member within the Faculty of Rehabilitation Medicine. Prerequisites: consent of student's graduate supervisor and instructor of record.

**REHAB 600 Theory and Issues in Rehabilitation Science**

★3 (*fi 6*) (either term, 0-3s-0). The course will provide an orientation to the theoretical base of rehabilitation science and its historical development. Students will critically examine existing theory and compare the theoretical base of rehabilitation science to other health related fields. Methods of theory development will be addressed, as well as a variety of ways of testing theoretical approaches. Students will study the field of rehabilitation science through selected readings, discussion, and research seminars.

**REHAB 601 Research Design in Rehabilitation Science**

★3 (*fi 6*) (either term, 0-3s-0). An orientation to the unique features of rehabilitation science that impact on research methodology, design, ethical issues, measurement, and statistical analyses. Issues such as chronicity of disease, low incidence of specific conditions resulting in small sample sizes, small increments of change over long periods of time, ordinal data, wide variability in patient characteristics,

group data versus single subject data, etc. will be studied in terms of appropriate research design, measurement, and analyses.

**REHAB 603 Seminars in Rehabilitation Science**

★3 (*fi 6*) (two term, 0-1.5s-0). This seminar is designed to allow students in the doctoral program to learn more about the scope of research in rehabilitation science. Students attend a weekly seminar presented by staff and graduate students in the Faculty of Rehabilitation Medicine and other health science faculties. Students registered in the PhD program in Rehabilitation Science must enrol in this seminar within the first two years of their doctoral programs and must present at least one seminar during each of the terms in which they are enrolled.

**REHAB 899 Directed Individual Research**

★3 (*fi 6*) (either term, 0-3s-0). May be repeated once. Restricted to students in the PhD program in Rehabilitation Science who did not write a master's thesis and for whom an in-lieu-of thesis experience is required in the plan of study. Prerequisite: Recommendation of PhD supervisor.

## 231.241 Religious Studies, RELIG

Office of Interdisciplinary Studies  
Faculty of Arts

**Note:** See the following sections for listings of other Office of Interdisciplinary programs. Comparative Literature (C LIT); Humanities Computing (HUCO); Interdisciplinary (INT D) Faculty of Arts Courses; Middle Eastern and African Studies (MEAS); Science, Technology and Society (STS); and Writing Studies (WRS).

### Undergraduate Courses

**0 RELIG 101 Introduction to the Religions of the World**

★6 (*fi 12*) (two term, 3-0-0). An introduction to the major religious traditions of the past and present. Note: Not open to students with credit in ET RE 102 or 103.

**L RELIG 200 Introduction to Religious Studies**

★3 (*fi 6*) (either term, 3-0-0). Survey of the history of Religious Studies; introduction to main disciplinary approaches. Required for Honors, Majors, and Minors.

**0 RELIG 201 Introduction to Biblical Hebrew**

★6 (*fi 12*) (two term, 3-0-2). This is an introduction to Hebrew alphabet, grammar, vocabulary, and syntax. The goal is to enable the student to read parts of the Hebrew Bible/Old Testament. The course serves also as foundation for the study of Mishnaic, Medieval, and Modern Hebrew. Designed for students with no previous knowledge of Hebrew.

**0 RELIG 202 Introduction to Old Testament/Hebrew Bible**

★3 (*fi 6*) (either term, 3-0-0). An introduction to the critical study of the Old Testament/Hebrew Bible.

**0 RELIG 205 Introduction to Judaism**

★3 (*fi 6*) (either term, 3-0-0). An introduction to the varied world of Judaism: its ways of life, beliefs, history and thought.

**0 RELIG 209 Coptic Language and Literature**

★3 (*fi 6*) (either term, 3-0-0). The coptic alphabet, grammar, syntax and vocabulary. The goal is to enable students to read parts of the early Christian (Sahidic) Coptic writings. Note: not open to students who have received credit in RELIG 297 Topic: Coptic Language and Literature.

**0 RELIG 211 Introduction to Early Christian Writings**

★3 (*fi 6*) (either term, 3-0-0). Critical introduction to the New Testament and other early Christian Writings in their historical cultural context.

**0 RELIG 212 Christian Traditions**

★3 (*fi 6*) (either term, 3-0-0). A survey of the Christian traditions in historical context. Note: Not open to students with credit in HIST 297 or ET RE 248.

**0 RELIG 215 Introduction to Community Action and Christianity**

★3 (*fi 6*) (either term, 3-0-0). Explores the link between Christian traditions and community action and considers the latter as a significant expression of faith. In addition to normal academic requirements, there will be relevant field trips.

**0 RELIG 220 Introducing Islam, from Prophetic Origins to World Tradition**

★3 (*fi 6*) (either term, 3-0-0). A survey of the main elements of the Muslim tradition and their role in the formation of Islamic culture. Note: Not open to students with credit in RELIG 221.

**0 RELIG 230 Introduction to Hinduism**

★3 (*fi 6*) (either term, 3-0-0). A study of the major traditions of classical Hinduism, and of the religious thinking and experience formed through these traditions.

**0 RELIG 239 Introduction to Sanskrit I**

★3 (*fi 6*) (either term, 3-0-2). Fundamentals of the Sanskrit language for reading and translation purposes. Designed for students with no previous knowledge of Sanskrit.



**O RELIG 240 Introduction to Buddhism**

★3 (fi 6) (either term, 3-0-0). A study of the emergence of Buddhism as a religion, its basic ideas, spirituality, and literature.

**O RELIG 252 Introduction to Chinese Religions**

★3 (fi 6) (either term, 3-0-0).

**O RELIG 274 Studies in Witchcraft and the Occult**

★3 (fi 6) (either term, 3-0-0).

**O RELIG 277 Women and World Religions**

★3 (fi 6) (either term, 3-0-0). Attitudes towards women in selected world religious traditions, specifically with respect to their participation in ritual and religious leadership.

**O RELIG 297 Special Topics in Religious Studies**

★3 (fi 6) (either term, 0-3s-0).

**O RELIG 304 Poets, Prophets, and Sages**

★3 (fi 6) (either term, 3-0-0). Literary-critical reading of the poetic books of the Old Testament/Hebrew Bible.

**O RELIG 305 Ancient Near East I**

★3 (fi 6) (either term, 3-0-0). Religion, society and culture in Sumer, Babylon, Assyria and ancient Israel. Note: not open to students with credit in CLASS 376.

**O RELIG 306 Ancient Near East II**

★3 (fi 6) (either term, 3-0-0). Religion, society and culture in Egypt, the Hittite Empire and Phoenicia. Note: Not open to students with credit in CLASS 377.

**O RELIG 307 The Kabbalah**

★3 (fi 6) (either term, 3-0-0). Studies in Jewish mysticism from the earliest period to modern times. Note: Not open to students with credit in RELIG 340.

**O RELIG 308 From Cyrus to Jesus**

★3 (fi 6) (either term, 3-0-0). Religion, society and culture in Palestine from the Persian conquest to the time of Jesus. Note: Not open to students with credit in CLASS 380.

**O RELIG 312 Eastern Orthodoxy**

★3 (fi 6) (either term, 3-0-0). History, sacral art, liturgy, spirituality and distinguishing points of doctrine.

**O RELIG 313 Studies in Early Christian Writings**

★3 (fi 6) (either term, 3-0-0). Social and literary study of select early Christian texts.

**O RELIG 314 Jesus**

★3 (fi 6) (either term, 3-0-0). A study of representations of Jesus in various historical and social contexts.

**O RELIG 320 Qur'anic Studies**

★3 (fi 6) (either term, 3-0-0). An examination of the style, structure, and doctrine of the Qur'an in the light of the Western critical evaluation of the text. Note: Not open to students with credit in RELIG 327.

**O RELIG 322 Contemporary Movements in Islam**

★3 (fi 6) (either term, 3-0-0). Recent developments in the philosophical, social, and religious life of Islam throughout the world. Note: Not open to students with credit in RELIG 328.

**O RELIG 344 Buddhism in Tibet and in the Himalayas**

★3 (fi 6) (either term, 3-0-0). A study of the dissemination of Buddhism in the Himalayas and in Tibet, its incorporation of local beliefs, the formation of monasticism, religious thought and literature.

**O RELIG 378 Shamanism**

★3 (fi 6) (either term, 3-0-0). A study of shamanism in the history of religions with special attention to myths, rituals, symbols, and the ecstatic experience. Note: Not open to students with credit in RELIG 366.

**O RELIG 379 The Religions of Aboriginal North-Americans**

★3 (fi 6) (either term, 3-0-0). A critical analysis of native North-American beliefs of the past and present. Note: Not open to students with credit in RELIG 280.

**O RELIG 397 Special Topics in Religious Studies**

★3 (fi 6) (either term, 0-3s-0).

**RELIG 401 Translating Religious Texts**

★3 (fi 6) (either term, 3-0-0). Consent of Instructor.

**O RELIG 402 Historical and Textual Studies in the Old Testament/Hebrew Bible**

★3 (fi 6) (either term, 3-0-0). Detailed studies of the individual books of the Old Testament/Hebrew Bible and related themes. Prerequisite: One course in the Old Testament/Hebrew Bible or consent of Program Coordinator.

**O RELIG 404 Literary Studies in Old Testament/Hebrew Bible**

★3 (fi 6) (either term, 3-0-0). Prerequisite: One course in Old Testament/Hebrew Bible or consent of Program Coordinator.

**O RELIG 409 Midrash and Literature**

★3 (fi 6) (either term, 3-0-0). Rabbinic Midrash (exposition of Scripture) in relation

to contemporary literary theory and the construction of religious community, with textual examples. Prerequisite: one course in Judaism, Hebrew Bible, or consent of Program Coordinator.

**O RELIG 415 Advanced Studies in Christianity**

★3 (fi 6) (either term, 3-0-0). Prerequisite: one course in Christianity or consent of Program Coordinator.

**O RELIG 422 Advanced Studies in Islam**

★3 (fi 6) (either term, 3-0-0). Prerequisite: one course in Islam or consent of Program Coordinator.

**O RELIG 442 Advanced Studies in Buddhism**

★3 (fi 6) (either term, 3-0-0). Prerequisite: one course in Buddhism or consent of Program Coordinator.

**O RELIG 460 Topics in Religion in Latin America**

★3 (fi 6) (either term, 3-0-0).

**O RELIG 475 Theories and Methods in Religious Studies**

★3 (fi 6) (either term, 3-0-0). Theories and disciplinary approaches in the study of religion, religions, and religious practices. Required for Honors and Majors. Prerequisite: consent of Program Coordinator.

**L RELIG 480 Directed Reading in Religious Studies**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Program Coordinator.

**O RELIG 497 Special Topics in Religious Studies**

★3 (fi 6) (either term, 0-3s-0).

**RELIG 499 Honors Essay in Religious Studies**

★6 (fi 12) (two term, 0-3s-0). Preparation of the Honors essay. Formerly RELIG 501.

**Graduate Courses****RELIG 502 Historical and Textual Studies in the Old Testament/Hebrew Bible**

★3 (fi 6) (either term, 3-0-0).

**L RELIG 504 Literary Studies in the Old Testament/Hebrew Bible**

★3 (fi 6) (either term, 3-0-0).

**RELIG 509 Advanced Studies in Midrash and Literature**

★3 (fi 6) (either term, 3-0-0).

**L RELIG 510 Selected Topics in Religious Studies**

★3 (fi 6) (either term, 3-0-0).

**L RELIG 516 Special Topics in Early Christianity**

★3 (fi 6) (either term, 3-0-0).

**RELIG 520 Specialized Studies in Islam**

★3 (fi 6) (either term, 3-0-0). An in-depth study of the problems of Islamic Studies.

**RELIG 542 Advanced Studies in Buddhism**

★3 (fi 6) (either term, 0-3s-0).

**RELIG 560 Topics in Advanced Studies in Religion in Latin America**

★3 (fi 6) (either term, 3-0-0).

**L RELIG 575 Theories and Methods in Religious Studies**

★3 (fi 6) (either term, 3-0-0).

**L RELIG 580 Directed Reading Course I**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

**L RELIG 581 Directed Reading Course II**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

**L RELIG 675 Graduate Seminar**

★1 (fi 2) (either term, 0-1s-0). This is a pass/fail course.

**231.242 Renewable Resources, REN R**

Department of Renewable Resources  
Faculty of Agricultural, Life and Environmental Sciences

**Note:** See also Agricultural and Resource Economics (AREC), Animal Science (AN SC), Environmental and Conservation Sciences (ENCS), Forest Economics (FOREC), Forest Engineering (FOREN), Forest Science (FOR), Plant Science (PL SC), Soil Science (SOILS), and Interdisciplinary (INT D) Undergraduate Course listings for related courses.

The following courses were renumbered:

Old	NEW
REN R 485	REN R 495
ENCS 207	REN R 299
FOR 302, 303, 304	REN R 299

## Undergraduate Courses

### **L** REN R 110 Natural Resource Measurement

★3 (*fi 6*) (second term, 3-0-3). Designed to introduce students to the principles and practices of measuring timber, water, range, wildlife, biodiversity and recreation.

### **L** REN R 120 Woody Plants I

★3 (*fi 6*) (first term, 3-0-4). Identification, classification, distribution, habitat, and basic ecology of trees, important shrubs and herbaceous species in forests of Alberta and Canada. There will be field trips to sites where living specimens can be examined. "Requires payment of additional student instructional support fees." Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

### **L** REN R 201 Introduction to Geomatic Techniques, in Natural Resource Management

★3 (*fi 6*) (first term, 3-0-3). Methods and applications of surveying, global positioning systems (GPS), geographic information systems (GIS), photogrammetry, air photo interpretation and meteorological technologies as they relate to natural resource management.

### **L** REN R 250 Water Resource Management

★3 (*fi 6*) (second term, 3-0-0). Global perspective of supply of and demand for water, basic hydrologic principles, concepts in water management, human intervention in the hydrologic cycle, and environmental issues related to this intervention. Prerequisite: ★30 at the university level with at least ★6 in the life or natural sciences. Credit will be given for only one of ENCS 203 and REN R 250.

### **REN R 299 Environmental and Conservation Sciences and Forestry Field School**

★3 (*fi 6*) (Spring/Summer, 3 weeks). Combines the concepts, theories and practices of environmental, conservation and forest sciences in an off-campus field experience. Field skill proficiency in planning, measurement, analysis and reporting is emphasized for biophysical and socioeconomic components of the environment. Prerequisites: ★45 university credit and REN R 110, SOILS 210 and a plant identification course are strongly recommended. Students must complete this course prior to completion of the final ★30 of their program. Requires payment of additional student instructional support fees." Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Consent of Instructor is required for students outside the Faculty of Agricultural, Life and Environmental Sciences. [Renewable Resources] Credit may not be obtained in this course if previous credit has been obtained for ENCS 308 or FOR 302/303/304.

### **L** REN R 321 Tree Physiology

★3 (*fi 6*) (first term, 3-0-3). Study of physiological processes in trees. Emphasis on primary and secondary metabolism, gas exchange, transport processes, growth, and environmental effects. ★3 Chemistry and one of BIOL 107 or PL SC 221 are strongly recommended.

### **REN R 327 The Mosses of Alberta: Conservation and Identification**

★3 (*fi 6*) (second term, 3-0-3). This is an introduction to identification and conservation of the mosses of Alberta, with a strong emphasis on field identification. Students are introduced to the morphological characters used to identify Alberta mosses, with supplementary information about individual species' habitat affinities and distribution within Alberta. Lecture topics include basic morphology, conservation and management of species diversity, and rare/endangered species found within Alberta. Students learn to identify more than 110 species from the province's six major natural regions. Prerequisites, PLSC 221 or BIOL 208, or consent of instructor.

### **L** REN R 340 Forest Fire Management

★3 (*fi 6*) (second term, 3-0-0). Fire thermophysics, combustion energetics, fire behavior, fuels measurement and manipulation, fire effects; prescribed burning and introduction of fire spread models. Applications of fire as part of sophisticated forest management. Credit will not be received for both FOR 340 and REN R 340.

### **L** REN R 350 Physical Hydrology

★3 (*fi 6*) (second term, 3-0-3). Principles of physical and land-use hydrology. The interaction of vegetation, soils, and storage processes with physiography and climate in regulation of hydrologic processes and hydrologic response of watersheds including effects of disturbance on these functions. Prerequisite: SOILS 210 or written consent of Instructor. Credit will only be given for one of FOR 350 and REN R 350.

### **L** REN R 401 Special Topics in Renewable Resources

★3-6 (*variable*) (either term, variable). Directed study in the multiple aspects of renewable resources. Open to third or fourth year students upon consent of instructor. Sections may be offered in a Cost Recovery format at an increased rate of fee assessment; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

### **L** REN R 410 Principles of Remote Sensing

★3 (*fi 6*) (first term, 3-0-3). Basic principles of spectral reflectance and emittance, and atmospheric effects as they apply to the acquisition and analysis of imagery; digital image analysis for geographical information systems; application to renewable

resource inventory and management and environmental impact assessment. Prerequisite: A 300-level course in at least one of the natural sciences.

### **L** REN R 414 Agroforestry Systems

★3 (*fi 6*) (first term, 3-0-0). Principles, complexity, and diversity of agroforestry. Classification of agroforestry systems. Agroforestry systems in North America, specifically Canada. Plant and soil aspects of and interactions among the components in agroforestry systems. Use of agroforestry systems to enhance land productivity and sustainability. Socioeconomic aspects of agroforestry. Prerequisite: 60 units of university courses.

### **L** REN R 421 Advanced Tree Physiology

★3 (*fi 6*) (second term, 3-0-0). Stress physiology of trees and tree seedlings; mechanisms of stress action and stress resistance; effects of silvicultural practices on growth and physiology; planting stress. Prerequisite: consent of Instructor.

### **L** REN R 426 Geographical Information Systems Applications in Renewable Resources

★3 (*fi 6*) (second term, 0-0-3). A combination of computer lab instruction and directed studies in applied GIS. The focus of the course is an individual project of the student's choosing. Prerequisites: EAS 221, FOREN 201, or REN R 425 or consent of Instructor. Sections may be offered in a Cost Recovery format at an increased rate of fee assessment; refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

### **L** REN R 430 Forest Resources Management

★3 (*fi 6*) (first term, 3-0-3). Analytical techniques used by renewable resource managers for management of wildland areas for single or multiple outputs; problems of defining optimality when confronted with competing uses and multiple outputs. Prerequisite: FOR 210; Corequisite: FOREC 345.

### **L** REN R 439 Forest Management Planning

★3 (*fi 6*) (second term, 0-3s-0). Seminar presentations and discussions by students of contemporary forest management planning. Prerequisite: REN R 430.

### **L** REN R 440 Disturbance Ecology

★3 (*fi 6*) (first term, 3-0-0). This course will cover various aspects of disturbance ecology, including concepts of disturbance frequency, severity, intensity; ecological resilience and resistance and ecosystem responses to and recovery from disturbance. Students will define what a disturbance is and critically evaluate disturbance types and their characteristics in different ecosystems and their implications for conservation, sustainability of ecosystems, and application to reclamation / restoration. Prerequisites: Third or fourth year standing and BIOL 208. [Renewable Resources]

### **L** REN R 450 Environmentally Sustainable Agriculture

★3 (*fi 6*) (second term, 3-0-0). Land-management issues that influence the sustainability of both agriculture and the land resource. Role of ecological processes in determining sustainability and the development and adoption of practices that facilitate long-term viability of both agriculture and biophysical resources. The concept of the agro-ecosystem and application of ecological principles to agricultural land management. Use of environmental indicators to measure and predict long-term sustainability of agricultural land management. Prerequisites: ★60 at university level including SOILS 210, and (BIOL 208 or PL SC 221).

### **L** REN R 452 Forest Watershed Management

★3 (*fi 6*) (first term, 0-3s-0). Seminar discussions/presentations on issues and methods in forest management and the production, protection, and regulation of wildland water resources. Relationship between disturbance (natural/anthropogenic) and water yield, regime, water quality. Watershed management as a component of integrated wildland management (ECA procedures, hydrologic modeling, stream protection zones (SPZs), best management practices (BMPs) and cumulative effects assessment). Prerequisite: ★60 at university level. Credit will only be given for one of FOR 450 and REN R 452.

### **REN R 456 International Forest Conservation and Management**

★3 (*fi 6*) (Winter/Spring/Summer, variable). Participation in a trip to a selected region is required as part of the course. Biophysical, social, historical and economic factors that influence forest conservation and management are examined; forest resources, ecological services, forest conservation and management practices, policies and regulations are evaluated and discussed. Students complete background research, participate in seminar discussions, and complete a report on the region visited. A different region is visited each year. Course may not be offered every year. Students must contact the instructor at least 4 months prior to the departure date. Requires payment of additional miscellaneous fees, including a non-refundable deposit that is due at least 3 months prior to the departure date. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Credit will not be received for both FOR 456 and REN R 456.

### **L** REN R 468 Management and Conservation of Genetic Resources

★3 (*fi 6*) (second term, 3-0-0). Principles and issues in conserving and managing plant and animal genetic resources from the global perspective. Lectures will be supplemented with case studies. Students are assigned tasks, individually and in groups. Prerequisite: consent of Instructor.

**REN R 469 Biodiversity Analysis**

★3 (*fi 6*) (second term, 3-0-0). Introduction to the theory and application of biodiversity with an emphasis on quantitative analysis of biodiversity. The course covers the concepts of biodiversity (genetic, species and ecosystem), diversity measurements, estimation of species richness, synthetic patterns and generating mechanisms of species diversity (species-abundance, species-area, distribution-abundance, local-regional, beta diversity, richness-productivity, body size-richness, etc.) and the implications of the patterns and theories to the conservation of biodiversity. Laboratory session involves using statistical software R for analyzing various diversity data. Prerequisite: consent of instructor.

**REN R 477 Wildlife-Human Activities: Conflicts, Assessment and Mitigation**

★3 (*fi 6*) (second term, 3-0-0). Human population growth, worldwide, continues to significantly impact the biological diversity of natural systems. One measure of this impact has been to evaluate man's ecological footprint. This course examines the footprint within evolving systems, in part, relating to the Aspen- Parkland Landscape, Grassland Ecology, Species Introductions, Fragility of the Peace- Athabasca Delta Ecosystem, Impacts of Ungulate Disease Transmissions, Neo-tropical Bird Conservation and Shade Grown Coffee issues. Topics also include reductionism in biodiversity, natural urban areas protection, changing perceptions about natural history and ecological cascading phenomena triggered by wildlife management actions. Prerequisite: fourth year standing or consent of Instructor.

**REN R 478 Environmental Footprint Assessment**

★3 (*fi 6*) (second term, 3-0-0). This course examines human effects, especially those related to increasing population size, on ecosystems. Reduction of biodiversity, natural urban areas protection, changing perceptions about natural history, and ecological cascading phenomena triggered by wildlife management actions are explored. Prerequisite: ★90 credits with ★30 at 300 or 400 level or consent of Instructor. [Renewable Resources]

**REN R 480 Experimental Design and Data Analysis in the Environmental Sciences**

★3 (*fi 6*) (first term, 3-0-3). Introduction to the scientific method; presentation of quantitative data in forestry, conservation and environmental sciences; common research approaches and experimental designs; fundamental concepts of statistics; classical hypothesis testing and Bayesian inference; parametric and non-parametric statistical tests; tests for binomial data; linear, non-linear, and multiple regression. Prerequisite: a minimum of ★60 of university-level course; ★3 introductory statistics recommended. [Renewable Resources]

**REN R 495 Land Reclamation and Revegetation**

★6 (*fi 12*) (two term, 3-3s-0). Principles, practices, and philosophy of land reclamation and revegetation of disturbed lands. Topics include types of land disturbances and regulations governing their reclamation, site preparation, soil reclamation and remediation, seed mix design, planting methods, plant species selection, monitoring, determining success, plant community ecology and change, bioengineering, phytoremediation, vegetative reclamation, and restoration. Illustrated with case studies. Team based land reclamation project required. Should be taken in students' last year as the Capstone Course for the Land Reclamation Major. Prerequisites: ★90 university credit including introductory courses in soil science, hydrology, ecology, and vegetation science; and ENCS 307 or equivalent; and ★3 in vegetation science at the 300- or 400-level (e.g. botany, forestry, plant ecology, plant resources, plant science, range science, weed science); and ★6 in soil science at the 300- or 400-level. Prerequisites or corequisites: ★3 in vegetation science at the 300- or 400-level; and ★3 in soil science at the 300- or 400-level; and ENCS 455. ENCS 406 recommended. Note: This course is not open to anyone who has taken REN R 475 or 485.

**Note:** 400-level courses listed under ENCS, FOR, INT D, REN R or SOILS and offered by the Department of Renewable Resources may be taken for graduate credit under certain circumstances. FOREC 445, 473, and INT D 421, 465 may also be taken for graduate credit under certain circumstances.

**Graduate Courses****REN R 501 Special Topics in Renewable Resources**

★3-6 (*variable*) (either term, variable). Directed study in the multiple aspects of renewable resources. Open to fourth year or graduate students upon consent of instructor.

**REN R 535 Operations Research for Natural Resource Management**

★3 (*fi 6*) (second term, 3-0-0). Mathematical programming, decision analysis and computer simulation applied to natural resource management problems. Prerequisites: AREC 214 or MATH 120 and at least ★60 credit in university courses.

**REN R 545 Small Watershed Hydrology**

★3 (*fi 6*) (first term, 0-3s-0). An examination of land use and management practices affecting water quantity and quality in rural watersheds. Considerations of snowmelt hydrology. Current hydrologic models and their treatment of infiltration, runoff, and evapotranspiration. Model calibration and validation with field data.

Prerequisite: A course in hydrology or water resources. Facility with computers an asset. Offered in alternate years.

**REN R 580 Biometrical Techniques in Agri-food, Environmental and Forest Sciences**

★3 (*fi 6*) (second term, 3-0-3). Application of biometrical techniques in agri-food, environmental, and forest sciences with emphasis on complex analysis of variance designs (i.e., mixed models, split-plot, nested designs, repeated measures, analysis of covariance), regression (linear, non-linear, Poisson); approaches to analysis of categorical data, non-parametric techniques. Prerequisite: a minimum of ★90 of university-level course work, REN R 480 (or equivalent), or consent of instructor. (Offered jointly by the Departments of Agricultural, Food and Nutritional Science and Renewable Resources.)

**REN R 595 Advanced Land Reclamation**

★3 (*fi 6*) (first term, 0-3s-0). An examination of current topics in reclamation, restoration, revegetation and remediation of disturbed lands. Topics cover vegetation and soil responses to disturbance and development of reclaimed (eco)systems through anthropogenic and natural recovery. Prerequisite: consent of Instructor.

**REN R 601 Forest Biology**

★3 (*fi 6*) (first term, 0-3s-0). Seminar presentations and discussions by students on the biology and environment of forest ecosystems. The objective of this course is to develop a broader and greater holistic understanding of the biota and physical environments of forest ecosystems. Course team taught by Department of Renewable Resources staff. Prerequisite: consent of Department.

**REN R 602 Forest Resources Management**

★3 (*fi 6*) (second term, 0-3s-0). Seminar presentations and discussions by students on the management of forest ecosystems for traditional and non-traditional values. The objective is to examine human, resource, economic, and policy problems of integrated forest management. Course team taught by Department of Renewable Resources staff. Prerequisite: consent of Department.

**REN R 603 Graduate Research Skills**

★1 (*fi 2*) (first term, 1.5-0-0). Prepares graduate students to function in a research environment. Focuses on the development of communication and presentation skills, the publication process, and proposal preparation. The grade is credit/no credit.

**REN R 604 Graduate Research Seminar**

★1 (*fi 2*) (second term, 0-1.5s-0). Prepares graduate students to function in a research environment. Focus is applied communication of research. All students are required to present a seminar, present a research poster, and critique a seminar. Attendance at the seminars and poster session is required. If possible, REN R 604 should not be taken until the student has some research results to present. The grade is credit/no credit.

**REN R 610 Seminar in Research Methods**

★3 (*fi 6*) (second term, 3-2s-0). Use of the scientific method in research, formulation of hypotheses, design of experiments, interpretation of data. Prerequisite: consent of Instructor.

**REN R 680 Advanced Biometrics**

★3 (*fi 6*) (first term, 3-0-0). Designed to introduce students to some advanced, modern statistical methods useful for analyzing ecological/environmental data. Topics include multivariate analysis (principal component analysis, correspondence analysis, canonical correspondence analysis), general/generalized linear regression (multiple regression, logistic regression, Poisson regression), repeated measurement/time series analysis, nonparametric statistics, sampling techniques, Bayesian statistics, Monte Carlo simulation, meta-analysis, and risk/uncertainty assessment. Laboratory session involves using statistical software R for data analysis. Prerequisite: REN R 580 and consent of instructor.

**REN R 690 Applied Multivariate and Spatial Statistics**

★3 (*fi 6*) (second term, 3-0-3). This course introduces descriptive multivariate and spatial statistical techniques for analysis of biological and environmental data. The mathematical foundations of techniques are discussed, but the emphasis of this course is visualization, analysis, and interpretation of complex environmental data sets. Topics include: (1) database management, (2) vector and matrix operations, (3) all basic multivariate techniques, (4) distance-based ordinations, (5) principles of spatial statistics, (6) multivariate analysis of spatial data, and (7) ecological modeling applications. Students will conduct a course project based on their own data sets. Prerequisite: Consent of Instructor.

**REN R 900 Research Project**

★6 (*fi 12*) (variable, unassigned). Required of all Soils MAg candidates in their final year. It does not usually involve collection of original data but makes use of published or unpublished data from other sources. The report is to be defended before a committee of three staff members, one member being from outside the Department of Renewable Resources.



## 231.243 Research, RSCH

Faculty of Graduate Studies and Research

### Graduate Courses

#### RSCH 900 Graduate Research

★9 (*fi 1*) (either term, unassigned). Restricted to Visiting Graduate Students at the University of Alberta who are only conducting research. Approval of the Department and the Faculty of Graduate Studies and Research required.

## 231.244 Rural Sociology, R SOC

Department of Rural Economy  
Faculty of Agricultural, Life and Environmental Sciences

**Note:** See also Agricultural and Resource Economics (AREC), Environmental and Conservation Sciences (ENCS), Forest Economics (FOREC), Interdisciplinary Undergraduate Courses (INT D) listings for related courses.

### Undergraduate Courses

#### **O** R SOC 355 Rural Communities and Global Economies

★3 (*fi 6*) (second term, 3-0-0). The historic and contemporary role of rural regions as extractive economies in the global marketplace is discussed from a macro-sociological perspective. Sociological concepts are applied to the study of the structural constraints and opportunities facing social and economic systems in rural regions. Prerequisite: ★30 or more of university level course work.

#### **O** R SOC 365 Sociology of Environment and Development

★3 (*fi 6*) (first term, 3-0-0). Examines the relationship between development and environment at the local, regional, national and international levels. Critically discusses development strategies, the environmental and social forces promoting them, and the distribution of environmental and social impacts. Also examines alternative development strategies, sustainable development experiences and relevant international policy.

#### **O** R SOC 400 Special Topics

★3 (*fi 6*) (either term, 0-3s-0). Individual study. Study of selected topic or problem requiring both written and oral reports. Prerequisite: consent of the Department Chair.

#### R SOC 430 Social Impact Assessment

★3 (*fi 6*) (second term, 3-0-0). Examination of the theory and application of social impact assessment methods with a focus on the evaluation of environment and natural resource regulatory policy and planning. Includes a series of case studies of recent environmental policy proposals to illustrate the methods used to evaluate the social and cultural impacts of such proposals. Prerequisite: One of the following: R SOC 355, or equivalent, or consent of Instructor. Credit will only be given for one of R SOC 430, R SOC 530, AREC 450 or 550.

#### **O** R SOC 441 Risk Communication

★3 (*fi 6*) (second term, 0-3s-0). Principles, concepts, processes and strategies for the communication of risks to human health posed by potentially hazardous agents or situations. Topics include communication and risk communication theory, the risk communication process, and the role of risk communication as part of an integrated risk management strategy. Prerequisites: ★75 or more.

#### **O** R SOC 450 Environmental Sociology

★3 (*fi 6*) (second term, 3-0-0). Introduction to a field in sociological inquiry that addresses how individuals and groups influence, and are influenced by, natural resources and environmental conditions. Examination of individual-level influences, such as beliefs, attitudes, and behaviors, as well as broader social-level influences at the institutional and organizational level. Focus is on providing an understanding and appreciation for the interaction between human attitudes, behaviors, and organizations with other components of the ecosystem. Prerequisite: ★60 or more. An introductory Sociology course is strongly recommended.

### Graduate Courses

**Note:** The following undergraduate courses may be taken for credit by graduate students in Rural Economy: R SOC 400, 450.

#### R SOC 500 Research Projects in Rural Sociology

★3 (*fi 6*) (either term, 0-3s-0). Individual study. Investigations of a special problem involving field or library study and preparation of written reports. Prerequisite: consent of the Department Chair.

#### R SOC 515 Quantitative Social Research Methods

★3 (*fi 6*) (either term, 3-0-0). Principles and practice of social research within environmental and natural resource sociology. Topics include survey research, evaluation research, data collection, multi-variable analysis, and report writing. Prerequisite: SOC 315 or equivalent.

The most current Course Listing is available on Bear Tracks.

#### R SOC 530 Social Impact Assessment

★3 (*fi 6*) (either term, 3-0-0). Examination of the theory and application of social impact assessment methods with a focus on the evaluation of environmental and natural resource regulatory policy and planning. Includes a series of case studies of recent environmental policy proposals to illustrate the methods used to evaluate the social and cultural impacts of such proposals. Prerequisite: consent of Instructor. Credit will only be given for one of AREC 450, 550, R SOC 430 and 530.

#### **O** R SOC 542 Risk Communication and Policy

★3 (*fi 6*) (second term, 0-3s-0). Advanced principles, concepts, processes and strategies for the communication of risks to human health posed by potentially hazardous agents or situations. Topics include communication and risk communication theory, the risk communication process, and the role of risk communication as part of an integrated risk management strategy, as well as in depth examination of empirical research methods and specific risk communication issues. Prerequisites: consent of Instructor.

#### **O** R SOC 555 Natural Resource Sociology

★3 (*fi 6*) (second term, 3-0-0). Examines social problems and challenges in natural resource dependent regions. Covers social theories of development, public participation, social impacts, institutional arrangements, and social capacity for natural resource management and community development. Prerequisite: R SOC 450 or equivalent.

#### **O** R SOC 558 The Sociology of Environmental Risk: Theory and Applications

★3 (*fi 6*) (either term, 0-3s-0). Theoretical and empirical research on the study of environmental risk in the social sciences, and their application in various institutional areas. Divergent theoretical perspectives on risk within the social sciences, directions taken by empirical researchers in the analysis of the construction and perception of environmental risk, as well as current institutional mechanisms for risk management and social impact assessment. Prerequisite: consent of Instructor.

#### **O** R SOC 559 States, Social Movements and the Environment

★3 (*fi 6*) (either term, 3-0-0). Covers classic and contemporary theories of states and social movements and their application to environmental and ecological issues. Topics include the Environmental State; relationships among state and societal forces; sub-national, national, and international environmental politics; political distinctions among environmental and ecological issues; and the potential for sustainability governance. Prerequisite: consent of Instructor.

#### R SOC 600 Directed Studies

★3 (*fi 6*) (either term, 0-3s-0). Analysis of selected research problems and design of research projects in rural, resource, environmental and development sociology. Prerequisite: Consent of Department Chair.

#### R SOC 900 Directed Research Project

★3 (*fi 6*) (variable, unassigned).

## 231.245 Russian, RUSS

Department of Modern Languages and Cultural Studies  
Faculty of Arts

### Notes

- (1) The Department reserves the right to place students in the language course appropriate to their level of language skill.
- (2) Placement tests may be administered in order to assess prior background. Students with a Russian language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in a more advanced course more suitable to their level of ability. Students seeking to fulfill their Language Other than English requirement may begin at any one appropriate level, but must take the full ★6 in one language.
- (3) The Department will withhold credit from students completing courses for which prior background is deemed to make them ineligible. For example, 100-level courses are normally restricted to students with little or no prior knowledge in that language. Should a student with matriculation standing, or those possessing prior background (such as native speakers or those for whom it is their first language) register in the 100-level course, credit may be withheld.
- (4) Students requiring information about program planning and course selections for the Dalhousie University-University of Alberta Russian Studies Program in the USSR (see Arts section) should consult an undergraduate advisor in the Department of Modern Languages and Cultural Studies.
- (5) See also Modern Languages and Cultural Studies (MLCS) and Slavic and East European Studies (SLAV) listings and INT D courses offered by the Faculty of Arts.

### Undergraduate Courses

<https://www.beartracks.ualberta.ca>

**O RUSS 111 Beginners' Russian I**

★3 (fi 6) (either term, 5-0-0). Essentials of grammar, reading, and pronunciation. Designed to give a working knowledge of the Russian language. Note: not to be taken by students with credit in RUSS 100, or with native or near native proficiency, or with Russian 30 or its equivalents in Canada and other countries.

**O RUSS 112 Beginners' Russian II**

★3 (fi 6) (either term, 5-0-0). Prerequisite: RUSS 111 or consent of Department. Note: not to be taken by students with credit in RUSS 100, or with native or near native proficiency, or with Russian 30 or its equivalents in Canada and other countries.

**O RUSS 211 Second-Year Russian I**

★3 (fi 6) (first term, 4-0-0). Russian grammar, composition, oral practice. Prerequisite: RUSS 112 or consent of Department. Note: not to be taken by students with credit in RUSS 201 or 202.

**O RUSS 212 Second-Year Russian II**

★3 (fi 6) (second term, 4-0-0). This course is a continuation of RUSS 211. Prerequisite: RUSS 211 or consent of Department. Note: not to be taken by students with credit in RUSS 202.

**RUSS 300 Russian: Learn it, Live it, Love it**

★6 (fi 12) (either term, 3-0-0). Intensive six-week course in Russian culture and language taught in Russia. Prerequisite: RUSS 212 or consent of Department.

**O RUSS 303 Russian in Context I**

★3 (fi 6) (either term, 3-0-0). The continued development of grammatical and conversational skills, with reading contemporary Russian and viewing and discussing films and television programs. Prerequisite: RUSS 212 or consent of Department. Note: not to be taken by students with credit in RUSS 401 or 402.

**O RUSS 304 Russian in Context II**

★3 (fi 6) (either term, 3-0-0). Debates on topics selected by students. Prerequisite: RUSS 303 or consent of Department. Note: not to be taken by students with credit in RUSS 401 or 402.

**O RUSS 325 Readings in Russian I**

★3 (fi 6) (either term, 3-0-0). Study of pre-20th century Russian literature in the original. Prerequisite: RUSS 212 or consent of Department. Note: not to be taken by students with credit in RUSS 215 or 216.

**O RUSS 326 Readings in Russian II**

★3 (fi 6) (either term, 3-0-0). Reading and analysis of texts from 20th century Russian literature in the original. Prerequisite: RUSS 212 or consent of Department. Note: not to be taken by students with credit in RUSS 215 or 216.

**O RUSS 333 Saints and Sinners**

★3 (fi 6) (either term, 3-0-0). Religious and anti-religious themes in Russian literature of the 19th and 20th centuries, highlighting the reflection of Russian Orthodox and popular culture in the texts. This course is taught in English and will not fulfill the Language other than English requirement.

**O RUSS 403 Russian Media and Internet**

★3 (fi 6) (either term, 3-0-0). Emphasis on the enhancement of language skills in the context of life in today's Russia. Contemporary textual genres of the popular media, including those of the Internet. Intensive reading, critical discussions, and creative writing. Prerequisite: RUSS 304 or consent of Department.

**O RUSS 404 Russian Language and Film**

★3 (fi 6) (either term, 3-0-0). Use of contemporary Russian films and television to improve the practical language and literacy skills both orally and in writing. Prerequisite: RUSS 304 or consent of Department.

**O RUSS 408 Russian for Heritage Speakers**

★3 (fi 6) (either term, 3-0-0). For native speakers of Russian who want to improve their writing skills. Introduction to different styles of writing and composition. Prerequisite: consent of Department.

**O RUSS 427 Themes and Variations in Russian Literature to 1917**

★3 (fi 6) (either term, 3-0-0). The superfluous man, the alien, witches and devils, the fantastic and other themes in pre-revolutionary Russian literature. Russian majors will do a significant part of readings and assignments in Russian; others may do readings and assignments in English. Prerequisite for Russian majors: RUSS 304 or consent of Department.

**O RUSS 428 Tsardom to Empire: Topics in Russian Official Culture**

★3 (fi 6) (either term, 3-0-0). Russian majors will read most of the texts and assignments in Russian; others may do readings and assignments in English. Prerequisite: RUSS 304 or consent of Department.

**O RUSS 443 Russian-English Translation**

★3 (fi 6) (either term, 3-0-0). Exercises in translation with emphasis on both literary and non-literary texts. Prerequisite: RUSS 304, or consent of Department. Not open to students with credit in RUSS 441 or 442.

**RUSS 447 Russian for Scholarly Purposes**

★3 (fi 6) (either term, 3-0-0). Develops reading skills in Russian through study

of its grammatical and syntactic structures, and the analysis of sample texts. Prerequisite: RUSS 304 or consent of Department.

**RUSS 461 Russian Critical Discourse in Transition**

★3 (fi 6) (either term, 3-0-0). Introduction to the major trends and figures in the history of the Russian Humanities during the Soviet and the post-Soviet periods. Prerequisite: RUSS 304 or consent of Department.

**O RUSS 483 Brave New Word: Soviet and Post-Soviet Russian Literature and Culture**

★3 (fi 6) (either term, 3-0-0). Thematic focus varies from year to year. Russian majors will do a significant part of readings and assignments in Russian; others may do readings and assignments in English. Prerequisite for Russian majors: RUSS 304 or consent of Department.

**RUSS 495 Honors Thesis**

★3 (fi 6) (either term, 0-3s-0).

**O RUSS 499 Special Topics**

★3 (fi 6) (either term, 3-0-0).

**Graduate Courses****RUSS 503 Russian Media and Internet**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**RUSS 504 Russian Language and Film**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**RUSS 528 Tsardom to Empire: Topics in Russian Official Culture**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**RUSS 561 Russian Critical Discourse in Transition**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**RUSS 599 Directed Reading**

★3 (fi 6) (either term, 3-0-0).

**RUSS 641 Studies in Russian Poetry**

★3 (fi 6) (either term, 3-0-0).

**RUSS 698 Topics in Russian Linguistics**

★3 (fi 6) (either term, 3-0-0).

**RUSS 699 Topics in Russian Literature and Culture**

★3 (fi 6) (either term, 3-0-0).

**231.246 Scandinavian, SCAND**

Department of Modern Languages and Cultural Studies  
Faculty of Arts

**Note:** See also listings under Danish (DANSK) Modern Languages and Cultural Studies (MLCS), Norwegian (NORW) and Swedish (SWED).

**Undergraduate Courses****O SCAND 341 Old Norse Mythology and Legends**

★3 (fi 6) (either term, 3-0-0). Survey of Old Scandinavian mythology from the earliest times to the end of the Viking Period. Readings in English from the Poetic and Prose Eddas, including the heroic legends and lays. Also included is a brief look at runic inscriptions and skaldic poetry. This course does not fulfill the language-other-than-English requirement of the BA degree.

**O SCAND 342 Vikings and Sagas**

★3 (fi 6) (either term, 3-0-0). Survey of the cultural history of the Viking and Medieval periods in Scandinavia with selections in English from the Old Norse sagas. The course will also include a brief overview of Scandinavian folklore. This course does not fulfill the language-other-than-English requirement of the BA degree.

**O SCAND 345 Literature, Culture, and Civilization from the Reformation to the 20th Century**

★3 (fi 6) (either term, 3-0-0). Selections in English of representative authors from each of the major literary periods, with special attention to the cultural and historical background. This course will not fulfill the language-other-than-English requirement of the BA degree.

**O SCAND 353 Henrik Ibsen**

★3 (fi 6) (either term, 3-0-0). A selection of the dramas of Henrik Ibsen in English translation with background material on the life of the author and his times. Special emphasis on his social and symbolist plays, including their staging and presentation. This course will not fulfill the language-other-than-English requirement of the BA degree.

**O SCAND 354 August Strindberg**

★3 (fi 6) (either term, 3-0-0). A selection of the works of August Strindberg in English translation with background material on the life of the author and his

times. Special emphasis on his dramas, including their staging and presentation. This course will not fulfil the language-other-than-English requirement of the BA degree.

### SCAND 355 The Tales of Hans Christian Andersen

★3 (fi 6) (either term, 3-0-0). This course takes a life-and-letters approach to the author and his times, with special emphasis on his tales (in English translation) and their relationship to the theory and practice of the genre. This course will not fulfil the language-other-than-English requirement of the BA degree.

### SCAND 356 Women in Scandinavian Literature and Popular Culture

★3 (fi 6) (either term, 3-0-0). Various media which reflect women's lives and voices in Denmark, Norway, Sweden, Finland, Iceland, and Samiland. Note: This course will be taught in English and will not fulfill the Language other than English requirement.

### SCAND 410 Comparative Scandinavian Grammar and Stylistics

★6 (fi 12) (two term, 3-0-0). A comparative analysis of modern Norwegian, Swedish and Danish, with special concentration on advanced composition and stylistics in the student's target language. Prerequisite: DANSK 212, or NORW 212, or SWED 212, or consent of Department.

### SCAND 420 The Scandinavian Immigrant Experience in Canada

★3 (fi 6) (either term, 3-0-0). A survey of the history of Scandinavian immigration to Canada and its causes. The immigrant experience will be discussed as it is portrayed in works by authors such as Aksel Sandemose, Sven Delblanc, and Stephan G Stephansson. Prerequisite: DANSK 212, or NORW 212, or SWED 212, or consent of Department.

### SCAND 499 Special Topics

★3 (fi 6) (either term, 3-0-0).

## Graduate Courses

### SCAND 551 Old Norse Grammar

★3 (fi 6) (either term, 3-0-0). A survey of the grammar of Old Icelandic with readings of illustrative texts. This course does not fulfill the language other than English requirement for the BA.

### SCAND 552 Readings in Old Norse, Runology and Paleography

★3 (fi 6) (either term, 3-0-0). Readings of illustrative texts in Old Icelandic including a survey of runic writing and Old Norse manuscripts. Texts in modern Icelandic will also be examined. Prerequisite: SCAND 551 or consent of Department. This course does not fulfill the language other than English requirement for the BA.

## 231.247 Science, SCI

Faculty of Science

### Undergraduate Courses

#### SCI 100 Integrated Science

★27 (fi 54) (two term, 12-6s-9; 15-6s-9). This course will integrate the essential material of introductory Biology, Chemistry, Computing Science, Earth and Atmospheric Sciences, Mathematics, Physics and Psychology, providing a strong foundation in each discipline while allowing students to explore connections between the science disciplines. The curriculum is designed for students with a broad interest in all of the sciences and will focus on active and discovery learning through the use of lectures, tutorials, group discussions, group projects and laboratories. Prerequisites: Biology 30, Chemistry 30, Math 30 or Math 30-1 and Physics 30. Corequisite: WRS 103 in the Fall term. Enrollment is by consent of the Faculty of Science and requires a formal application. Students admitted to SCI 100 will be enrolled automatically in WRS 103. Restricted to first-year students.

## 231.248 Science politique, SC PO

Faculté Saint-Jean

### Cours de 1er cycle

#### SC PO 101 Introduction au gouvernement

★3 (fi 6) (premier semestre, 3-0-0). Une introduction aux institutions gouvernementales du Canada et d'ailleurs. Sujets étudiés: constitutions, assemblées législatives, organes exécutifs, fonction publique, cours de justice, gouvernement fédéral et d'autres sujets choisis. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour POL S 100.

#### SC PO 102 Introduction à la politique

★3 (fi 6) (deuxième semestre, 3-0-0). Une introduction aux concepts et enjeux des phénomènes politiques. Sujets étudiés: pouvoir ou influence, démocratie, droits et libertés, idéologie politique, opinion publique, élections, partis politiques, groupes de pression et autres sujets choisis. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour POL S 100.

The most current Course Listing is available on Bear Tracks.

#### SC PO 225 Gouvernement du Canada

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Analyse des structures du gouvernement du Canada : le fédéralisme, la Constitution, les Communes, le Sénat, le Cabinet, la Cour suprême, la fonction publique. Préalables : SC PO 101 ou SC PO 102 ou l'approbation du vice-doyen aux affaires académiques. Note : ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour SC PO 220 et pour POL S 221.

#### SC PO 226 Politique au Canada

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude des questions politiques au Canada comme la culture politique, le multiculturalisme ou encore la question autochtone, la place du Québec, de la mondialisation et des relations avec les États-Unis; analyse des partis politiques, des groupes de pression et des mouvements sociaux, des médias. Préalables : SCPO 101 ou SC PO 102 ou l'approbation du vice-doyen aux affaires académiques. Note : ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour SC PO 220 et pour POL S 221.

#### SC PO 261 Relations internationales I

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction au rôle de l'Etat au sein du système international ayant pour but de développer une connaissance des événements contemporains internationaux. Ce cours couvre la nature de la politique étrangère et la dynamique d'interaction entre les Etats.

#### SC PO 262 Relations internationales II

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction aux problèmes contemporains de relations internationales ayant pour but de développer une connaissance du système international. Ce cours porte sur le rôle des institutions internationales, des acteurs supra étatiques et non-étatiques, ainsi que certains enjeux liés à la mondialisation.

#### SC PO 270 Politique comparée

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction à des thèmes de politique comparée.

#### SC PO 320 La politique du système de santé au Canada

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Le développement du système de santé canadien, ses composantes législatives et philosophiques ainsi que son financement et son organisation; l'étude comparative des défis au système de santé canadien posés par les enjeux financiers, l'accès universel et les modes alternatifs. Notes :La priorité sera accordée aux étudiants du BSclnf (bilingue). Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour POL S 321 ou 322.

#### SC PO 423 Fédéralisme canadien

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Analyse du développement et des théories du fédéralisme canadien. On étudiera en particulier les problèmes actuels du système fédéral. Préalable(s): SC PO 225 ou l'approbation du Vice-doyen aux affaires académiques.

#### SC PO 428 Gouvernement et politique des provinces

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude des structures, des fonctions et des processus de certains gouvernements provinciaux au Canada. Préalable(s): SC PO 225 ou 226 ou POL S 221, ou l'approbation du Vice-doyen aux affaires académiques.

## Cours de 2e cycle

#### SC PO 499 Choix de sujets en science politique

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Cours dont le contenu varie d'une année à l'autre. Les sujets sont annoncés avant la période d'inscription. Préalable(s): l'approbation du Vice-doyen aux affaires académiques.

## 231.249 Science, Technology, and Society, STS

Office of Interdisciplinary Studies  
Faculty of Arts

**Note:** See the following sections for listings of other Office of Interdisciplinary programs. Comparative Literature (C LIT); Humanities Computing (HUCO); Interdisciplinary (INT D) Faculty of Arts Courses; Middle Eastern and African Studies (MEAS); Religious Studies (RELIG); and Writing Studies (WRS).

### Undergraduate Courses

#### STS 200 Introduction to Studies in Science, Technology and Society

★3 (fi 6) (either term, 3-0-0). An examination of the interrelations of science, technology, society and environment, emphasizing an interdisciplinary humanities and social sciences perspective. Note: not to be taken by students with credit in INT D 200. [Faculty of Arts, Office for Interdisciplinary Studies]

#### STS 297 Special Topics in Science, Technology and Society

★3 (fi 6) (either term, 3-0-0).



**ST 397 Special Topics in Science, Technology and Society**

★3 (fi 6) (either term, 3-0-0).

**ST 400 Advanced Topics in Science, Technology and Society**

★3 (fi 6) (either term, 0-3s-0). This capstone course for the major in Science, Technology, and Society will approach selected topics in an interdisciplinary manner, applying the approaches of the social sciences and humanities. Prerequisites: STS 200 and ★6 credits from two of the following courses: ANTHR 230, HIST 294, PHIL 265, C LIT 342 or consent of Instructor. [Faculty of Arts, Office for Interdisciplinary Studies]

**ST 497 Science, Technology and Society**

★3 (fi 6) (either term, 3-0-0).

## 231.250 Sciences de la Terre et de l'atmosphère, SCTA

Faculté Saint-Jean

### Cours de 1er cycle

**SCTA 100 La planète Terre**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-3). Origine et évolution de la Terre et du système solaire. Introduction à la tectonique des plaques et aux mouvements des roches. Équilibres énergétiques simples et interactions entre la radiation et l'atmosphère, le sol, les océans, les régions glacières, et cycle hydrologique global. Évolution de la vie, biogéographie et climat global dans l'échelle des temps géologiques. Cycle du carbone. Influence humaine sur la Terre. Minéraux et ressources énergétiques. Note : Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour SCTA 101 ou 102.

**SCTA 105 Évolution de la terre**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-3). Lien entre la tectonique des plaques de la Terre et l'origine des principaux groupes de roches et de minéraux. Tremblements de terre, géologie structurale, et l'origine de ceintures de montagnes. Processus de surface et leurs produits sédimentaires. Histoire de la vie et extinctions. Préalable: SCTA 100 ou 102. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour SCTA 101.

**SCTA 204 Environnement de l'Alberta**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Environnement physique de l'Alberta. Variations régionales dans les modèles du climat, modèles, eau, sols, végétation et faune. Une synthèse géographique de ces modèles donnera une connaissance globale et une appréciation de la province et de ses problèmes environnementaux. Préalable(s): SCTA 100, 101 ou 102, ou EAS 201 ou 210.

**SCTA 221 Introduction aux systèmes d'information géographique et à la télédétection**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-3). Présentation des principes de base des systèmes d'information géographiques et de la télédétection. Les cours magistraux mettront l'accent sur les fondements théoriques et méthodologiques, et les laboratoires couvriront des aspects techniques en considérant des cas pratiques à l'aide de logiciels. Préalable: un cours de science de niveau 100.

## 231.251 Sciences infirmières, SC INF

Faculty of Nursing

### Undergraduate Courses

**SC INF 217 Introduction aux sciences infirmières**

★8 (fi 16) (premier semestre, 2-6s-2). Une introduction à l'étude des sciences infirmières centrée sur la pratique professionnelle, et sur les soins communautaires et de longue durée (résidence assistée). L'accent est mis sur les communautés et client(e)s francophones. Préalables: ANATE 140, PHYSE 152, et MICRE 133. Concomitants: SC INF 218, NURS 305 ou 468, et PHILE 386. Note: Ce cours est réservé aux étudiant(e)s du programme BSc. inf. bilingue.

**SC INF 218 Introduction à la pratique infirmière**

★6 (fi 12) (premier semestre, 0-0-14c). Pratique infirmière novice dans la communauté francophone, les centres de soins de longue durée et les résidences assistées. L'accent est mis sur la promotion de la santé des client(e)s dans toutes les phases de la vie. Préalables: ANATE 140, PHYSE 152 et MICRE 133. Concomitants: SC INF 217, NURS 305 ou 468, et PHILE 386. Note: Ce cours est réservé aux étudiant(e)s du programme BSc. inf. bilingue.

**SC INF 301 Recherche en sciences infirmières**

★3 (fi 6) (premier semestre, 3-0-0). Introduction au processus de la recherche en sciences infirmières. Le cours comprend entre autre l'analyse comparative d'études choisies qui représentent différentes approches théoriques, méthodologiques, et analytiques. L'accent est mis sur la communication de la recherche, les besoins de l'utilisateur, et le développement des habiletés nécessaires à la critique de la recherche.

**SC INF 309 La santé mentale**

★6 (fi 12) (premier semestre, 3-6S-3 6W; 6-12s-6 3W). L'emphase de ce cours est sur la promotion de la santé mentale et les soins infirmiers aux personnes atteintes d'altérations aiguës et chroniques de santé mentale. Préalables: NURS 307 et 308. Concomitant: SC INF 310. Note: Ce cours est réservé aux étudiant(e)s du programme BSc inf bilingue.

**SC INF 310 Pratique infirmière en santé mentale**

★6 (fi 12) (premier semestre, 0-0-24C 7 semaines). Les étudiant(e)s auront l'occasion de mettre en pratique les concepts de sciences infirmières autour des problèmes en santé mentale aiguës et chroniques dans un milieu communautaire et/ou dans un hôpital. Préalables: NURS 307 et 308. Concomitant: NURS 309 ou SC INF 309. Note: Ce cours est réservé aux étudiant(e)s du programme BSc inf bilingue.

**SC INF 406 Pratique infirmière en santé communautaire**

★6 (fi 12) (l'un ou l'autre semestre, 0-0-16c). Les étudiant(e)s auront l'occasion de mettre en pratique les concepts de sciences infirmières en santé communautaire. La pratique comprendra l'évaluation de la santé et des interventions avec les familles en attente d'un nouveau-né. Les étudiant(e)s développeront des compétences en évaluation de la famille et de la communauté, en communication thérapeutique, et dans la planification, la prestation et l'évaluation des interventions infirmières en santé communautaire. Préalables: NURS 215, 307, 308, et SC INF 218. Concomitants: NURS 405. Note: Ce cours est réservé aux étudiant(e)s du programme BSc inf. bilingue. Les étudiant(e)s de ce programme ne doivent pas s'inscrire au cours NURS 406.

**SC INF 494 Synthèse des connaissances en sciences infirmières**

★3 (fi 6) (deuxième semestre, 0-7s-3 in 4 weeks). Synthèse et emphase sur les connaissances et l'application de la recherche en sciences infirmières dans un champ de pratique infirmière. Afin de pouvoir s'inscrire à ce cours l'étudiant(e) doit avoir complété avec succès tous les autres cours de son programme, sauf le cours concomitant SC INF 495.

**SC INF 495 Pratique infirmière VIII**

★9 (fi 18) (deuxième semestre, 0-1s-34c en 10 semaines). Approche exhaustive et consolidée à la pratique infirmière professionnelle. Concomitant: NURS 494. Ce cours est réservé aux étudiant(e)s du programme BSc. inf. bilingue. Les étudiant(e)s de ce programme ne doivent pas s'inscrire au cours NURS 495.

## 231.252 Sciences sociales, SCSOC

Faculté Saint-Jean

### Cours de 1er cycle

**SCSOC 225 Méthodes de recherche en sciences sociales**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-2). Initiation à quelques notions d'épistémologie concernant les sciences sociales et à quelques méthodes de recherche; principaux critères de la méthode scientifique et distinction avec les sciences exactes; construction des hypothèses et analyse conceptuelle; planification de la recherche et utilisation des documents; techniques de l'entrevue participante, de l'échantillonnage et de l'analyse de contenu. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour SCSOC 321 ou SOC 315.

**SCSOC 311 Histoire de la pensée politique et sociale I**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Survol historique et critique du développement de la pensée politique et sociale, de l'Antiquité à la Renaissance, en utilisant des textes choisis de quelques philosophes présocratiques (Héraclite, Parménide), Platon, Aristote, Boèce, Abélard, Thomas d'Aquin, Machiavel, Erasme.

**SCSOC 312 Histoire de la pensée politique et sociale II**★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude des principaux aspects de la pensée politique et sociale du XVII<sup>e</sup> siècle à nos jours, centrée sur l'évolution du libéralisme, de ses différentes tendances et des réactions d'opposition qu'il a suscitées. Seront abordées les oeuvres de Hobbes, Locke, Montesquieu, Rousseau, Voltaire, Payne, Adam Smith, Tocqueville, Marx, Weber, Durkheim et Louis Hartz.**SCSOC 322 Statistiques pour les sciences sociales**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-2). Application des méthodes statistiques à certains problèmes en sciences sociales. Interprétation des données en termes de moyennes, de mesures de variabilité et de mesures de relation: études de la théorie de l'échantillonnage et des tests d'hypothèses statistiques. Note: Ce cours faisait partie de SCSOC 320. Préalable(s): Mathématiques pures 30 or Mathématiques 30-1, et SCSOC 225 ou l'approbation du Vice-doyen aux affaires académiques. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour un cours de STAT ou STATQ.

**SCSOC 326 Fondements Des sciences sociales**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude critique des fondements théoriques de la connaissance et de la justification en sciences sociales, avec un accent particulier sur les disciplines suivantes : la sociologie, la science politique, l'histoire et l'anthropologie.

**SCSOC 460 Recherche appliquée: les média**

★6 (fi 12) (aux deux semestres, 208 heures). Stage de recherche appliquée dans les média. Formation en écriture, recherche, technologie de la communication, et autres. Préalable(s): une moyenne de 3.0. Les stagiaires sont sélectionnés en fonction de la qualité de leur dossier et du nombre de places disponibles.

**231.253 Sciences socio-politiques, SCSP**

Faculté Saint-Jean

**Cours de 1er cycle****SCSP 520 Mémoire de Sciences socio-politiques**

★6 (fi 12) (aux deux semestres, 0-3s-0). Préparation du mémoire requis en quatrième année du programme de spécialisation en Sciences socio-politiques.

**231.254 Slavic and East European Studies, SLAV**Department of Modern Languages and Cultural Studies  
Faculty of Arts**Notes**

- (1) None of these courses will fulfil the language-other-than-English requirement of the BA degree.
- (2) For related courses see listings under Polish (POLSH), Russian (RUSS) and Ukrainian (UKR).
- (3) For additional courses relating to the Soviet Union and its successor states, and Eastern Europe, see also entries under Comparative Literature (C LIT), Earth and Atmospheric Sciences (EAS), Economics (ECON), History (HIST), Modern Languages and Cultural Studies (MLCS), Political Science (POL S), and Sociology (SOC).
- (4) See also INT D courses which are offered by the Faculty of Arts and which may be taken as options or as a course in this discipline.

**Undergraduate Courses****O SLAV 468 Nikolai Gogol/Mykola Hohol'**

★3 (fi 6) (either term, 3-0-0). Gogol as a cultural icon in the history of Russian and Ukrainian literatures. His life and works against the background of Russian Imperial cultural developments and the processes of nation building in the first half of the 19th century. English translations of texts available for those not majoring in Slavics.

**O SLAV 470 Women's Writing After the Fall of Communism**

★3 (fi 6) (either term, 3-0-0). The impact of political and economic changes on women's writing in the Slavic countries since 1989. Readings are available in English for non-majors.

**O SLAV 499 Special Topics**

★3 (fi 6) (either term, 3-0-0).

**Graduate Courses**

**Note:** See also INT D 543 and 544 for courses offered by more than one Department or Faculty and which may be taken as an option or as a course in this discipline.

**SLAV 512 Old East Slavic Literature and Culture**

★3 (fi 6) (either term, 3-0-0). Reading and analysis of major literary monuments from the 10th to 14th centuries. Prerequisite: consent of Department.

**SLAV 568 Nikolai Gogol/Mykola Hohol'**

★3 (fi 6) (either term, 3-0-0). Gogol as a cultural icon in the history of Russian and Ukrainian literatures. His life and works against the background of Russian Imperial cultural developments and the processes of nation building in the first half of the 19th century. Prerequisite: consent of Department.

**SLAV 570 Women's Writing After the Fall of Communism**

★3 (fi 6) (either term, 3-0-0). The impact of political and economic changes on women's writing in the Slavic countries since 1989. Prerequisite: consent of Department.

**SLAV 697 Topics in Slavic Folklore**

★3 (fi 6) (either term, 3-0-0).

**SLAV 698 Topics in Slavic Linguistics**

★3 (fi 6) (either term, 3-0-0).

The most current Course Listing is available on Bear Tracks.

**231.255 Sociologie, SOCIE**

Faculté Saint-Jean

**Cours de 1er cycle****O SOCIE 100 Introduction à la sociologie**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Examen de la théorie, des méthodes et de la substance de la sociologie. Étude de la façon dont les sociétés comprennent la culture, la socialisation, la déviance, la stratification et les groupes. Le processus de transformation sociale par les mouvements sociaux, l'industrialisation, etc. Note: Les étudiants en 3e année ou plus avancés devraient prendre SOC 300 plutôt que SOCIE 100.

**O SOCIE 225 Criminologie**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Analyse critique de la notion de crime et examen des diverses tentatives d'explication du crime à travers l'histoire de la criminologie. Analyse des processus de construction sociale sous-jacents à l'identité dite criminelle. Peut comprendre des sections Alternative Delivery; veuillez consulter le Fees Payment Guide dans la section University Regulations and Information for Students de l'annuaire.

**O SOCIE 260 Inégalité et stratification sociales**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction à l'étude des inégalités sociales structurées et de la pauvreté; approches théoriques majeures; conclusions des études empiriques clés, en mettant l'accent sur le Canada. Préalable(s): SOCIE 100 ou SOC 300.

**O SOCIE 269 Sociologie de la mondialisation**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction à l'analyse critique des transformations de l'économie-monde et de leurs impacts économiques, politiques, sociaux et culturels. La mondialisation comme fait social, les acteurs de la mondialisation, les discours pro-anti- et alter- mondialisation. Préalable : SOCIE 100 ou l'équivalent

**O SOCIE 301 Sociologie des rapports de sexes**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude comparée des rapports entre les femmes et les hommes dans certaines sociétés, en mettant l'accent sur le Canada contemporain; étude des rôles spécifiques à chaque sexe, et des théories relatives à leurs origines; recherche sociologique récente sur l'importance de la division sexuelle de la société.

**O SOCIE 348 Sociologie des média et de l'information**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). La place des média et des nouvelles technologies de l'information dans la société contemporaine. Étude des théories qui s'y rattachent, avec l'accent sur les débats entourant la question de la postmodernité. Préalable(s): SOCIE 100.

**O SOCIE 368 Etude des minorités et des groupes ethniques**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Analyse de processus sociaux qui permettent le développement et la compréhension du statut des minorités. Etude de cas des relations entre les groupes ethniques et minoritaires fondée sur les travaux réalisés à l'échelle nationale. Préalable(s): SOCIE 100 ou SOC 300.

**L SOCIE 402 Choix de sujets en sociologie**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Le contenu varie d'une année à l'autre. Les sujets sont annoncés avant la période d'inscription. Préalable(s): SOCIE 101 ou SOC 300.

**231.256 Sociology, SOC**Department of Sociology  
Faculty of Arts

**Note:** See also INT D 393 and 394 for courses which are offered by more than one Department or Faculty and which may be taken as options or as a course in this discipline.

**Undergraduate Courses****SOC 100 Introductory Sociology**

★3 (fi 6) (either term, 3-0-0). An examination of the theory, methods, and substance of Sociology. The study of how societies are shaped including economy, culture, socialization, deviance, stratification, and groups. The process of social change through social movements, industrialization, etc. Note: Not to be taken by students with credit in SOC 300.

**SOC 101 Canadian Society**

★3 (fi 6) (either term, 3-0-0). Development of Canadian society: including such topics as French-English relations, regionalism, relations with the USA, native rights, Canadian mosaic, inequalities, and conflicts.

**SOC 102 Social Problems**

★3 (fi 6) (either term, 3-0-0). Selected structural issues in various societies, including inequality, population growth, environment, and human rights.

**SOC 210 Introduction to Social Statistics**

★3 (fi 6) (either term, 3-0-2). Statistical reasoning and techniques used by sociologists to summarize data and test hypotheses. Topics include describing distributions, cross-tabulations, scaling, probability, correlation/regression and non-parametric tests. Prerequisite: One of SOC 100 or 300. Note: This course is intended primarily for students concentrating in Sociology.

**SOC 212 The Sociological Imagination**

★3 (fi 6) (either term, 3-0-0). What is society? What is sociology? An introduction to sociological theorizing. Prerequisite: One of SOC 100 or 300.

**SOC 224 Sociology of Deviance and Conformity**

★3 (fi 6) (either term, 3-0-0). Processes involved in defining behavior patterns as deviant; factors which influence conformity and change; examination of such behavior patterns as sexuality, alcoholism, drug use, and selected mental and physical disabilities; public reaction to such behavior. Prerequisite: One of SOC 100 or 300.

**SOC 225 Criminology**

★3 (fi 6) (either term, 3-0-0). Examination and attempted explanation of crime and juvenile delinquency, with an analysis of the social processes leading to criminal behavior. Prerequisite: One of SOC 100 or 300.

**SOC 226 Social Studies of Surveillance**

★3 (fi 6) (either term, 3-0-0). Critical analysis of the increased prominence of diverse forms of surveillance in contemporary society. Prerequisite: One 100-level Arts course.

**SOC 241 Social Psychology**

★3 (fi 6) (either term, 3-0-0). An introduction to the study of individual and group behavior observed in social processes. Prerequisites: One of SOC 100 or 300, or PSYCO 104 or 105. Note: SOC 241 and PSYCO 241 may not both be taken for credit.

**SOC 242 Biologically Coordinated Social Psychology**

★3 (fi 6) (either term, 3-0-0). A biologically consistent introduction to the study of individual and group behavior observed in social processes. Prerequisite: One of SOC 100, SOC 300, PSYCO 104, PSYCO 105, EDPY 200.

**SOC 251 Population and Society**

★3 (fi 6) (either term, 3-0-0). Population trends, issues and concerns in Canada and international contexts; social and cultural factors underlying fertility, mortality, and migration; urbanization; population change; population theory; and demographic analysis.

**SOC 260 Inequality and Social Stratification**

★3 (fi 6) (either term, 3-0-0). Introduction to the study of structured social inequalities and poverty; major theoretical approaches; findings from key empirical studies, with emphasis on Canada. Prerequisite: One of SOC 100 or 300.

**SOC 269 Introductory Sociology of Globalization**

★3 (fi 6) (either term, 0-3s-0). Introduces various aspects of globalization and its impact on our lives at local, national, and international levels. Prerequisite: One of SOC 100 or 300.

**SOC 271 Introduction to the Family**

★3 (fi 6) (either term, 3-0-0). An introduction to the study of family relationships and their variant forms with focus on mate selection, couple, kin, age, and gender dynamics, family dissolution or reconstitution and change. A comparative approach with emphasis on families in Canada. Prerequisite: One of SOC 100 or 300.

**SOC 301 Sociology of Gender**

★3 (fi 6) (either term, 3-0-0). Comparative study of sex roles in selected societies with an emphasis upon contemporary Canada; sex-specific role behaviors and theories regarding their origin; recent sociological research on the social effects of sex roles. Prerequisite: One of SOC 100 or 300.

**SOC 308 Honors Seminar**

★3 (fi 6) (either term, 0-3s-0). Introduction to specialization areas in Sociology and Department members involved in teaching and research in these areas. Prerequisite: consent of the Honors Advisor. Note: Restricted to Sociology Honors students. Required first term after entering Sociology Honors Program.

**SOC 315 Introduction to Social Methodology**

★3 (fi 6) (either term, 3-0-2). Research design, data collection, and data processing strategies used by sociologists. Topics include research values and ethics, reliability and validity, experimentation, survey research techniques, historical methods, field research, and content analysis. Prerequisite: SOC 210.

**SOC 321 Youth, Crime and Society**

★3 (fi 6) (either term, 3-0-0). A survey of the understanding and treatment of youth in the Canadian criminal justice system. Prerequisite: SOC 225.

**SOC 327 Criminal Justice Administration in Canada**

★3 (fi 6) (either term, 3-0-0). The evolution and evaluation of the theories of punishment; the law, the police and the courts; penal and reformatory institutions; probation and parole; experiments in reform and rehabilitation. Prerequisite: SOC 225.

**SOC 332 Sociological Theorizing: Modernity**

★3 (fi 6) (either term, 3-0-0). Using a range of classical and contemporary theories, examines what, if anything, is 'new' in 'modern' society. Prerequisite: SOC 212 or consent of Department.

**SOC 333 Sociological Theorizing: The Subject**

★3 (fi 6) (either term, 3-0-0). Using a range of classical and contemporary theories, examines the nature of social subjectivities (e.g. male/female, black/white, straight/gay etc.). Prerequisite: SOC 212 or consent of Department.

**SOC 334 Sociological Theorizing: Power**

★3 (fi 6) (either term, 3-0-0). Using a range of classical and contemporary theories, examines power in society. Prerequisite: SOC 212 or consent of Department.

**SOC 342 Socialization**

★3 (fi 6) (either term, 3-0-0). The processes of social development and how socio-cultural influences affect the individual from infancy to old age. Prerequisite: SOC 241 or PSYCO 241.

**SOC 343 Social Movements**

★3 (fi 6) (either term, 3-0-0). Empirical studies of movements for social change and the dynamics of collective mobilization in a local, national, and international context. Prerequisite: One of SOC 100, 300, 241, or PSYCO 241.

**SOC 344 Media Culture and Society**

★3 (fi 6) (either term, 3-0-0). Critical examination of the central issues and debates about the media-society relationship. Emphasis on the cultural, political and economic aspects of various media forms/genres, media theories, and audience considerations. Note: Not to be taken by students with credit in SOC 346 and not to be used as the prerequisite for SOC 444 or 477.

**SOC 345 Cultural Studies**

★3 (fi 6) (either term, 3-0-0). Introduction to theoretical paradigms, methodologies and fundamental concepts of postmodern sociology and cultural studies. Prerequisite: One of SOC 100 or 300.

**SOC 346 Media and the Production of Culture**

★3 (fi 6) (either term, 3-0-0). Media as cultural industries that contribute to the construction of meaning in contemporary societies. Prerequisite: Restricted to Faculty of Arts students who have completed the first year of their programs. Note: This is the prerequisite for SOC 444. Soc 346 may not be taken by students with credit in SOC 344.

**SOC 352 Population, Social, and Economic Development**

★3 (fi 6) (either term, 3-0-0). Principles of growth and development in their historical context with regard to developed countries, such as Canada, and in their contemporary context with regard to underdeveloped countries. The interrelationships of economic, social and demographic variables in the process of development. Problems of urbanization and industrialization; factors influencing social change in the modern West or Asia or Latin America or Africa. Prerequisite: One of SOC 100 or 300.

**SOC 363 Sociology of Work and Industry**

★3 (fi 6) (either term, 3-0-0). Sociological analysis of the changing nature and content of work, its diversity of industrial contexts and organizational forms, and its consequences for individuals and society, from Canadian and comparative perspectives. Prerequisite: One of SOC 100 or 300. Not open to students with credit in SOC 366.

**SOC 366 People in Industry**

★3 (fi 6) (either term, 3-0-0). Introduction to the sociological analysis of the attitudes and behavior of employees in work organizations, with emphasis on the contemporary Canadian situation. Note: Restricted to Engineering students only. Not open to students with credit in SOC 363.

**SOC 367 Knowledge and Human Society**

★3 (fi 6) (either term, 3-0-0). The nature and assessment of knowledge (e.g. values and belief systems manifest in art, science, technology) in the context of social systems; the connection between competing systems of knowledge and social change. Prerequisite: One of SOC 100 or 300.

**SOC 369 Sociology of Globalization**

★3 (fi 6) (either term, 0-3s-0). Critically examines various aspects of globalization from the perspective of world-system studies. Prerequisite: SOC 269.

**SOC 370 Racism and Decolonization**

★3 (fi 6) (either term, 0-3s-0). Examines decolonizing cultures with an emphasis on racism and its connection to other forms of social inequality, capitalism, multiculturalism and globalization. Prerequisite: SOC 212 or 269.

**SOC 372 Sociology of Canadian Development**

★3 (fi 6) (either term, 3-0-0). Approaches to understanding the dynamics of Canadian society such as staples, elites, social movements and political economy, and critical theory. Prerequisite: SOC 100.

**SOC 375 Sociology of Aging**

★3 (fi 6) (either term, 3-0-0). Aging as a socio-cultural phenomenon. Includes aging in relation to the self-concept, family, religion, politics, health, retirement



and leisure, housing, attitudes toward death, with particular emphasis on Canadian society. Prerequisite: One of SOC 100 or 300.

### **SOC 376 Sociology of Religion**

★3 (*fi 6*) (either term, 3-0-0). Religion as a social phenomenon; theories of religious behavior; religious authority and leadership; the individual's religion and the interplay with other spheres of social life; the role of religion in relation to social change and social integration. Prerequisite: One of SOC 100 or 300.

### **SOC 377 Sociology of Youth**

★3 (*fi 6*) (either term, 3-0-0). The comparative analysis of youth in various types of societies, with special emphasis on Canada including investigation of social structures and processes influencing behavior of young people.

### **SOC 382 Sociology of Health and Illness**

★3 (*fi 6*) (either term, 3-0-0). The distribution of health and illness in human populations, the social psychology of health and illness, and the social organization of health care. Prerequisite: One of SOC 100 or 300.

### **SOC 399 Field Placement in Criminology**

★6 (*fi 12*) (either term, 0-16s-0). Supervised work experience and seminar sessions. Note: Restricted to BA (Criminology) students.

### **SOC 401 Honors Individual Study**

★3 (*fi 6*) (either term, 3-0-0). Individual study opportunity on topics for which no specific course is currently offered by the Department. Course may be taken once only. Prerequisites: consent of instructor and Honors Advisor. Note: Restricted to Sociology Honors students. Closed to web registration.

### **SOC 402 Selected Topics in Sociology**

★3 (*fi 6*) (either term, 3-0-0). Content varies from year to year. Topics announced prior to registration period. Prerequisite: One of SOC 100 or 300.

### **SOC 403 Individual Study**

★3 (*fi 6*) (either term, 3-0-0). Individual study opportunity on topics for which no specific course is currently offered by the Department. Prerequisite: Consent of Instructor and the Undergraduate Advisor.

### **SOC 407 Honors Essay I**

★3 (*fi 6*) (either term, 3-0-0). Literature review and proposal stage of Honors Essay completed in SOC 408. Prerequisites: consent of instructor and Honors Advisor. Note: Restricted to Sociology Honors students. Closed to web registration.

### **SOC 408 Honors Essay II**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: SOC 407 and consent of instructor and Honors Advisor. Note: Restricted to Sociology Honors students. Closed to web registration.

### **SOC 410 Multi-Variable Sociological Analysis**

★3 (*fi 6*) (either term, 3-0-2). Further study of the use of multi-variable tabular analysis and multiple correlation/regression in social research. Special emphasis on different types of regression analysis and the causal analysis of social data. Prerequisites: SOC 210 and 315.

### **SOC 418 Qualitative Methods in Social Research**

★3 (*fi 6*) (either term, 3-0-2). Further study of the design and evaluation of qualitative research strategies. Topics include participant observation, ethnomethodology, unobtrusive measures, and document analysis. Prerequisites: SOC 210 and 315.

### **SOC 420 Selected Topics in Criminal Justice**

★3 (*fi 6*) (either term, 3-0-0). Topics may vary annually. Consult Department or instructor prior to registration. Prerequisites: SOC 225 and a 400-level Sociology course in Criminology.

### **SOC 421 Sociology of Punishment**

★3 (*fi 6*) (either term, 3-0-0). Historical and contemporary social underpinnings of punishment in the criminal justice apparatus. Prerequisites: SOC 225 and 327.

### **SOC 422 Native People and the Canadian Criminal Justice System**

★3 (*fi 6*) (either term, 3-0-0). Involvement of Native people as offenders and service-providers in the Canadian criminal justice system. Topics include antecedent conditions, policing, courts, corrections, victimization, crime prevention, and special offender groups. Prerequisite: SOC 327. Note: Not to be taken by students with credit in SOC 402 when dealing with native people and the Canadian criminal justice system.

### **SOC 423 Crime and Public Policy**

★3 (*fi 6*) (either term, 3-0-0). Social responses to criminal behavior, including general public attitudes and government legislation. Topics include police strategies; sentencing options; prediction research, and social prevention. Prerequisites: SOC 225 and 327.

### **SOC 426 Agencies of Social Control**

★3 (*fi 6*) (either term, 3-0-0). The study of the way agencies of social control carry out their tasks, including the dynamics within and the interaction among the agencies themselves. Prerequisite: SOC 225.

### **SOC 428 Social Theory, Crime and Justice**

★3 (*fi 6*) (either term, 3-0-0). Key social theories that describe, explain, challenge

or deconstruct 'crime', and theoretical critiques of contemporary crime-control arrangements. Prerequisite: One of SOC 332, 333 or 334.

### **SOC 429 Sociology of Law**

★3 (*fi 6*) (either term, 3-0-0). Conceptual and practical points of convergence between legal and social theory; processes by which legal rules are created, maintained and changed; law as an instrument of social control and change. Prerequisite: SOC 225.

### **SOC 430 Women and Crime**

★3 (*fi 6*) (either term, 0-3s-0). Key concepts, issues and debates with respect to women in the criminal justice system as offenders, defendants, prisoners, and victims. Prerequisite: SOC 225.

### **SOC 440 Theories in Social Psychology**

★3 (*fi 6*) (either term, 3-0-0). Current theories and related research in social psychology. Prerequisite: SOC 241 or PSYCO 241.

### **SOC 441 Sociology of Religious Sects**

★3 (*fi 6*) (either term, 3-0-0). Examination of conversion, membership maintenance, member disaffiliation, and resource acquisition strategies among religious sects. Emphasis on Canadian examples. Prerequisites: SOC 224 and SOC 376.

### **SOC 442 Reinforcement and Social Behavior**

★3 (*fi 6*) (either term, 3-0-1). Operant principles applied to the fundamental processes of social behavior. An examination of critical studies utilizing a reinforcement perspective. Prerequisite: SOC 241 or PSYCO 241.

### **SOC 443 Ethnomethodology**

★3 (*fi 6*) (either term, 3-0-0). Study of everyday life emphasizing the methods people use to construct a sense of order and meaning. Prerequisite: SOC 241.

### **SOC 444 Critical Media Studies**

★3 (*fi 6*) (either term, 3-0-0). Analysis of media texts as social forms with emphasis on television, advertising, and emerging media technologies. Prerequisite: SOC 346.

### **SOC 445 Built Environments**

★3 (*fi 6*) (either term, 0-3s-0). The significance of social spaces as constituted by architecture, design and artifacts of material culture. Prerequisite: SOC 345 or permission of the Instructor.

### **SOC 451 Sociology of Human Fertility**

★3 (*fi 6*) (either term, 3-0-0). Emphasis on the social, social-psychological, and cultural correlates of human fertility in historical and contemporary contexts; reproductive health programs; prediction and control. Prerequisite: SOC 251 or consent of Instructor.

### **SOC 452 Mortality and Population Health**

★3 (*fi 6*) (either term, 3-0-0). Analysis of variations, trends and patterns of human mortality and morbidity in historical and contemporary contexts; comparisons of the experiences of Canada, other industrialized nations and developing countries with respect to causes of death and illness; demographic aspects of aging and its relationship to morbidity and mortality health surveys and policies. Prerequisite: SOC 251.

### **SOC 455 Sociology of Human Migration**

★3 (*fi 6*) (either term, 3-0-0). Internal and international migration and its relationship to resources, economic opportunities, societal organization, and urbanization in Canada and other countries; determinants and consequences of migration; adjustment of migrants and policy issues. Prerequisite: SOC 251 or consent of Instructor.

### **SOC 459 The Demography of Marriage and Family**

★3 (*fi 6*) (either term, 3-0-0). Review and analysis of the demographic interrelationships of fertility, mortality, and migration with marriage and the family; a cross-cultural review of historical trends, contemporary patterns and future implications; emphasis on statistical measurement, family planning and policy in the Canadian setting. Prerequisite: SOC 271.

### **SOC 461 Sociology of Art**

★3 (*fi 6*) (either term, 3-0-0). A sociological study of art forms including painting, literature, music, and architecture; cross-cultural analysis of the roles of the artist; the relationship of art forms and movements to different social conditions and social change. Prerequisite: One of SOC 100, or 300.

### **SOC 462 Science and Society**

★3 (*fi 6*) (either term, 3-0-0). Factors in the development of the cognitive and organizational domain of science; interrelations between science and major societal institutions and culture; the future of science and the future of society. Prerequisite: One of SOC 231, 332, 333 or 367.

### **SOC 466 Selected Topics in Comparative Societies**

★3 (*fi 6*) (either term, 3-0-0). Comparative studies of various regions, cultures and societies. Topics may vary annually. Prerequisite: One of SOC 100 or 300.

### **SOC 473 Sociology of Death and Dying**

★3 (*fi 6*) (either term, 3-0-0). Comparative examination of death and dying in

socio-cultural contexts, including theoretical and methodological issues. Prerequisite: SOC 241 or 375.

#### **SOC 475 Advanced Sociology of Aging**

★3 (fi 6) (either term, 3-0-0). In-depth examination of selected theoretical approaches, methodological issues, and topics of substantive concern in the study of aging and the aged. Prerequisite: SOC 375.

#### **SOC 476 Religion and Societies**

★3 (fi 6) (either term, 3-0-0). A comparative survey of the major world religions in interaction with the socioeconomic and political structures of various societies. Prerequisite: SOC 376.

#### **SOC 477 Media and Cultural Globalization: Theory and Practice**

★3 (fi 6) (either term, 0-3s-0). How global flows of people, information, popular entertainment and consumer culture contribute to collective social identities at the local level. Prerequisites: SOC 212 or 269 or 346 or consent of the instructor. Note: Not open to students with credit in SOC 365.

#### **SOC 486 Sociology of Mental Illness**

★3 (fi 6) (either term, 3-0-0). Sociological aspects of mental health and illness. Includes historical perspectives, diagnostic issues, and perspectives on causation and treatment. Prerequisite: SOC 224 or 382. Note: Not to be taken by students with credit in SOC 474.

#### **SOC 489 Population and Social Policy**

★3 (fi 6) (either term, 3-0-0). The relationship between population phenomena and social policy interventions. Prerequisite: SOC 251 or consent of Instructor.

#### **SOC 490 Sociology and Public Policy**

★3 (fi 6) (either term, 3-0-0). Past and present relationship among sociology, social research and social needs, including the impact of sociological research on public policy formation, program development and implementation and program assessment. Prerequisite: ★12 in Sociology.

#### **SOC 492 Queer-ing the Social**

★3 (fi 6) (either term, 0-3s-0). Sex/gender/sexuality as a complex social constellation. Prerequisite: One of SOC 301, 332, 333, 334, W ST 201.

#### **SOC 499 Advanced Field Placement in Criminology**

★6 (fi 12) (either term, 0-16s-0). Supervised work experience and seminar sessions. Prerequisite: SOC 399. Note: Restricted to BA (Criminology) students.

## Graduate Courses

**Note:** See also INT D 593 for a course which is offered by more than one Department or Faculty and which may be taken as an option or as a course in this discipline.

#### **SOC 503 Conference Course in Sociology for Graduate Students**

★3 (fi 6) (first term, 3-0-0).

#### **SOC 504 Conference Course in Sociology for Graduate Students**

★3 (fi 6) (second term, 3-0-0).

#### **SOC 509 Multi-Variable Sociological Analysis**

★3 (fi 6) (either term, 3-0-2). Prerequisites: SOC 210 and 315. Note: Not to be taken by students with credit in SOC 411 or 410.

#### **SOC 515 Quantitative Methods in Social Research**

★3 (fi 6) (either term, 3-0-2). Prerequisites: SOC 210 and 315 or equivalent. Note: Not to be taken by students with credit in SOC 412 or 417. Not available for credit for students with credit in R SOC 415.

#### **SOC 518 Qualitative Methods in Social Research**

★3 (fi 6) (either term, 3-0-2). Prerequisite: SOC 418 or equivalent or permission of Instructor.

#### **SOC 519 Comparative and Historical Methods in Sociological Research**

★3 (fi 6) (either term, 3-0-2). Prerequisites: SOC 210 and 315 or equivalent. Note: Not to be taken by students with credit in SOC 419.

#### **SOC 523 Social Theory, Sovereignty and Law**

★3 (fi 6) (either term, 0-3s-0).

#### **SOC 524 Advanced Field Placement in Criminal Justice**

★6 (fi 12) (either term, 0-40c-0). Prerequisite: consent of Department. Note: restricted to MA (Criminal Justice) students.

#### **SOC 525 Seminar in Criminal Justice**

★3 (fi 6) (either term, 0-3s-0).

#### **SOC 531 Seminar in the History of Sociological Thought**

★3 (fi 6) (either term, 0-3s-0).

#### **SOC 533 Research Design**

★3 (fi 6) (second term, 0-3s-0).

#### **SOC 535 Seminar in Contemporary Sociological Theory**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: SOC 333.

#### **SOC 543 Media Studies: Critical and Cultural Approaches**

★3 (fi 6) (either term, 0-3s-0).

#### **SOC 545 Biologically Coordinated Sociology**

★3 (fi 6) (either term, 0-3s-0).

#### **SOC 549 Social Movements**

★3 (fi 6) (either term, 0-3s-0).

#### **SOC 552 Mortality and Population Health**

★3 (fi 6) (either term, 3-0-0). Prerequisite: SOC 251. Note: Not to be taken by students with credit in SOC 452.

#### **SOC 554 Sociology of Human Migration**

★3 (fi 6) (either term, 3-0-0). Prerequisite: SOC 251. Note: Not to be taken by students with credit in SOC 455.

#### **SOC 568 Seminar in Ethnic and Minority Relations**

★3 (fi 6) (either term, 0-3s-0).

#### **SOC 569 Topics in Globalization**

★3 (fi 6) (either term, 0-3s-0).

#### **SOC 576 Seminar in Sociology of Religion**

★3 (fi 6) (either term, 0-3s-0).

#### **SOC 603 Conference Course**

★3 (fi 6) (first term, 3-0-0).

#### **SOC 604 Conference Course**

★3 (fi 6) (second term, 3-0-0).

#### **SOC 605 Seminar in Teaching and Professional Skills**

★0 (fi 1) (either term, unassigned).

#### **SOC 606 Special Topics I**

★1.5 (fi 3) (either term, 0-1.5s-0).

#### **SOC 607 Special Topics II**

★1.5 (fi 3) (either term, 0-1.5s-0).

#### **SOC 616 Structural Equation Modeling with LISREL**

★3 (fi 6) (either term, 3-0-0). Prerequisite: SOC 609.

#### **SOC 622 Topics in Criminology and Deviance**

★3 (fi 6) (either term, 0-3s-0).

#### **SOC 630 Psychoanalytic Social Theory**

★3 (fi 6) (either term, 0-3s-0).

#### **SOC 631 Seminar in Advanced Sociological Theory**

★3 (fi 6) (either term, 0-3s-0).

#### **SOC 632 Seminar in Theory Construction**

★3 (fi 6) (either term, 0-3s-0).

#### **SOC 634 Material and Virtual Culture**

★3 (fi 6) (either term, 0-3s-0).

#### **SOC 670 Sociology of Gender and Family**

★3 (fi 6) (either term, 0-3s-0).

#### **SOC 672 Social Structure and Public Policy**

★3 (fi 6) (either term, 0-3s-0).

#### **SOC 675 Seminar in the Sociology of Aging**

★3 (fi 6) (either term, 0-3s-0).

#### **SOC 676 Globalization, Religion and Fundamentalisms**

★3 (fi 6) (either term, 0-3s-0).

#### **SOC 683 Seminar in the Sociology of Health and Illness**

★3 (fi 6) (either term, 0-3s-0).

#### **SOC 900 Directed Research Project**

★3 (fi 6) (variable, unassigned).

## 231.257 Soil Science, SOILS

Department of Renewable Resources  
Faculty of Agricultural, Life and Environmental Sciences

**Note:** See also Environmental and Conservation Sciences (ENCS), Forest Science (FOR), Plant Science (PL SC), Renewable Resources (REN R), and Interdisciplinary (INT D) Undergraduate Courses listings for related courses.

The following courses were renumbered effective 1996-97:

Old	New	Old	New
SOILS 425	REN R 425	SOILS 545	REN R 545

## Undergraduate Courses

### **L SOILS 210 Introduction to Soil Science and Soil Resources**

★3 (fi 6) (first term, 3-0-3). Elementary aspects of soil formation, soil occurrence in

natural landscapes, soil classification, soil resource inventory; basic morphological, biological, chemical, and physical characteristics employed in the identification of soils and predictions of their performance in both managed and natural landscapes. Prerequisite: Must have completed a university-level course in life or natural sciences. A university-level chemistry course is strongly recommended.

#### **L SOILS 420 Soil Formation and Landscape Processes**

★3 (fi 6) (first term, 3-0-3). Soil formation, with emphasis on landscape processes as factors in soil development; pedogenic processes and their relation to environmental issues; soils; vegetation, and geological associations; kinds and distribution of soils in Canada; soil classification; field examination and computer-assisted learning of soils and their landscape. Field trips. "Requires payment of additional student instructional support fees." Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar. Prerequisite: SOILS 210 or any 200-level earth science course.

#### **L SOILS 430 Soil Biogeochemistry**

★3 (fi 6) (second term, 3-0-3). Introduction to the main components of the soil biota; the metabolic and molecular diversity of microbial populations and their role in soil processes; the microbiology and biochemistry of decomposition of organic matter in soil; biogeochemical cycling of N, P, S, Si, base cations and metals; and the application of soil microbiology to selected environmental problems. Prerequisite: SOILS 210 or consent of instructor.

#### **L SOILS 440 Soil Physics**

★3 (fi 6) (first term, 3-0-3). Quantitative characterization of soil physical properties. Description and measurement of soil physical properties that determine retention and movement of water in soils, soil temperature, soil aeration, soil strength, soil compaction and consolidation. Particular emphasis will be placed on current in situ techniques and their applications. Examples from areas of land resource management, soil remediation, agriculture, and forestry will be used to illustrate the principles. Prerequisites: SOILS 210 and completion of ★60 university credit in the sciences.

#### **L SOILS 450 Soil Environmental Chemistry**

★3 (fi 6) (second term, 3-0-3). Chemical processes in soil and related terrestrial environments and the consequences of these processes as they relate to environmental quality and pollution of soil and water, nutrient levels, and mechanical stability or dispersion of clays and soils. The course describes fundamental chemical concepts such as soil solution speciation, precipitation/dissolution, and adsorption exchange and then uses the concepts in the examination and computer modelling of some current environmental, agricultural and engineering problems. The leachate chemistry of certain large volume industrial wastes is also examined in the course. Prerequisite: A chemistry course plus completion of two full years of university.

#### **L SOILS 460 Soil Fertility**

★3 (fi 6) (second term, 3-0-3). Essential plant nutrients; factors influencing nutrient availability; methods of evaluating soil fertility; correction of soil fertility problems; manufacture, composition, and use of fertilizers. Prerequisite: SOILS 210.

## Graduate Courses

**Note:** 400-level courses listed under ENCS, FOR, INT D, REN R or SOILS and offered by the Department of Renewable Resources may be taken for graduate credit under certain circumstances. FOREC 445, 473, and INT D 421, 465 may also be taken for graduate credit under certain circumstances.

## 231.258 Spanish, SPAN

Department of Modern Languages and Cultural Studies  
Faculty of Arts

### Notes

- (1) The Department reserves the right to place students in the language course appropriate to their level of language skill.
- (2) Placement tests may be administered in order to assess prior background. Students with a Spanish language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in an advanced course more suitable to their level of ability. Students seeking to fulfill their Language Other than English requirement may begin at any one appropriate level, but must take the full ★6 in one language.
- (3) The Department will withhold credit from students completing courses for which prior background is deemed to make them ineligible. For example, 100-level courses are normally restricted to students with little or no prior knowledge in that language. Should a student with matriculation standing, or those possessing prior background (such as native speakers or those for whom it is their first language) register in the 100-level course, credit may be withheld.
- (4) All courses at the 300-level, except SPAN 330 and 360 which are taught in English, include language acquisition among other course requirements.
- (5) See also listing under Modern Languages and Cultural Studies (MLCS).

The most current Course Listing is available on Bear Tracks.

## Undergraduate Courses

### **L SPAN 111 Beginners' Spanish I**

★3 (fi 6) (either term, 5-0-0). Intended for students with no previous knowledge of the language and designed to lead to a working knowledge of spoken and written Spanish with a focus on listening, reading, speaking, writing, and intercultural competence. Note: not to be taken by students with credit in SPAN 100, or with native or near native proficiency, or with Spanish 30 or its equivalents in Canada and other countries.

### **L SPAN 112 Beginners' Spanish II**

★3 (fi 6) (either term, 5-0-0). A continuation of SPAN 111. Prerequisite: SPAN 111 or consent of Department. Note: not to be taken by students with credit in SPAN 100, or with native or near native proficiency, or with Spanish 30 or its equivalents in Canada and other countries.

### **L SPAN 211 Intermediate Spanish I**

★3 (fi 6) (either term, 4-0-0). Intended to further develop knowledge of spoken and written Spanish with a focus on intercultural communicative competence. Prerequisite: Spanish 30 (or equivalent) or SPAN 112 or consent of Department. Note: not to be taken by students with credit in SPAN 200 or 201 or by students with advanced standing equivalent or near native ability.

### **L SPAN 212 Intermediate Spanish II**

★3 (fi 6) (either term, 4-0-0). A continuation of Spanish 211. Prerequisite: SPAN 211 or consent of Department. Note: Not to be taken by students with credit in SPAN 201 or by students with advanced standing equivalent or near native ability.

### **L SPAN 300 Advanced Spanish**

★3 (fi 6) (either term, 3-0-0). A high-intermediate to advanced-level course intended to improve overall proficiency in spoken and written Spanish. Emphasis on intercultural communicative competence. Prerequisite: SPAN 212 or consent of Department. May be taken at the same time as SPAN 314 or 315. Note: SPAN 300 is not open to students with advanced standing equivalent or near native ability or with credit in SPAN 306.

### **O SPAN 303 Popular Culture and its Traditions**

★3 (fi 6) (either term, 3-0-0). For students who are learning Spanish and wish to broaden their understanding of cultural life in the Spanish-speaking world (media, film, dance, literature, art, performance, and advertising from Spain and the Americas). Prerequisite: SPAN 300 or 306 or consent of Department.

### **O SPAN 305 Spanish and English, a Linguistic Comparison**

★3 (fi 6) (either term, 3-0-0). A comparison of Spanish and English from a linguistic perspective. Topics relating to the construction and construal of meaning at a variety of levels, including word meaning, sentence structure, narrative and discourse structure, and use of metaphor. Attention to issues relating to translation. Taught in English. Pre-or-corequisite: SPAN 300 or 306 or consent of Department. Note: This course can also be applied to the MLCS Certificate in Translation Studies.

### **O SPAN 306 Spanish for Heritage Speakers**

★3 (fi 6) (either term, 3-0-0). Intended for speakers with an advanced level of oral proficiency, but no previous formal study of Spanish. Focus is on topics such as grammar and sentence structure, spelling and punctuation, interference between English and Spanish, and colloquial versus formal usages with the objective of improving skills in oral and written communication. Prerequisite: consent of Department. May be taken at the same time as SPAN 314 or 315. Not to be taken by students with credit in SPAN 300.

### **O SPAN 314 Civilization and Culture of Spain**

★3 (fi 6) (either term, 3-0-0). Through a series of selected topics, the course offers a panoramic view of Spanish civilization and culture from the Medieval Period to our present time with an overall emphasis on the construction of 'Spanish' cultural identities. Designed to complement the study of Spanish. May be taken at the same time as SPAN 300, 306, 315; or with consent of Department.

### **SPAN 315 Civilization and Culture of Latin America**

★3 (fi 6) (either term, 3-0-0). A panoramic overview of Latin American civilization and culture from Precolumbian times to the present. Designed to complement the study of Spanish and to provide an introduction to the major trends in thought and cultural forms. Pre - or corequisite: SPAN 300, 306 or consent of Department.

### **O SPAN 321 Foundational Fictions of Spanish America**

★3 (fi 6) (either term, 3-0-0). Readings from selected texts to continue language acquisition and to introduce students to aspects of Spanish American literature and culture. Prerequisite: SPAN 300 or 306 or consent of Department.

### **O SPAN 322 Foundational Fictions of Spain**

★3 (fi 6) (either term, 3-0-0). Readings from selected texts to continue language acquisition and to introduce students to aspects of Spanish literature and culture. Prerequisite: SPAN 300 or 306 or consent of Department.

### **O SPAN 325 Introduction to Cinema**

★3 (fi 6) (either term, 3-0-3). Some of the major works of film of Spain and/or Spanish America. Prerequisite: SPAN 300 or 306 or consent of Department.

<https://www.beartracks.ualberta.ca>



**SPAN 326 Hispanic Children's Literature**

★3 (fi 6) (either term, 3-0-0). Key works of children's literature in Spain and Latin America. Prerequisite: SPAN 300 or 306 or consent of Department.

**SPAN 330 The Latino Experience Abroad (in English Translation)**

★3 (fi 6) (either term, 3-0-0). Exile, immigration, identity, language, and other questions concerning relocation and cultural and social integration represented in the work of authors from Latin American and Caribbean communities in North America. Note: not to be taken by students with credit in LA ST 330. Does not fulfill any Faculty of Arts Language Other than English requirement. Taught in English.

**SPAN 335 The Spanish Caribbean**

★3 (fi 6) (either term, 3-0-0). Literature and culture in Cuba, Puerto Rico and the Dominican Republic. Prerequisite: SPAN 300 or 306 or consent of Department.

**SPAN 341 The 'Roaring Twenties' in Transatlantic Perspective**

★3 (fi 6) (either term, 3-0-0). Cultural production of Spanish America and Spain in the 1920's. Prerequisite: SPAN 300 or 306 or consent of Department.

**SPAN 342 Urban Poetics: The City and Modernity in the Spanish American Avant-gardes**

★3 (fi 6) (either term, 3-0-0). How avant-garde artists in Spanish America produced contrasting visions of the city. Prerequisite: SPAN 300 or 306 or consent of Department.

**SPAN 344 Drama in Spain and/or Latin America**

★3 (fi 6) (either term, 3-0-0). A study of different dramatic forms from Spain and/or Latin America in their historical, social, political, and cultural context. Prerequisite: SPAN 300 or 306.

**SPAN 360 Latin America in its Literature (in English Translation)**

★3 (fi 6) (either term, 3-0-0). Relations among the literature, culture, history, and politics of Latin America through a selection of texts originally written in Spanish, Portuguese and/or an indigenous language. Note: not to be taken by students with credit in LA ST 360 or C LIT 363. Does not fulfill any Faculty of Arts Language Other than English requirement. Taught in English.

**SPAN 370 The Sounds of Spanish**

★3 (fi 6) (either term, 3-0-0). Sound system of Spanish: phonetics, phonology, evolution of the language. Special attention to the pronunciation differences from English. Prerequisite: SPAN 300 or 306 or consent of Department.

**SPAN 371 Meaning and Form in Spanish**

★3 (fi 6) (either term, 3-0-0). Spanish syntax, semantics, lexical semantics, bilingualism, etc. Special emphasis on their relevance to applied linguistics. Prerequisite: SPAN 300 or 306 or consent of Department.

**SPAN 372 History of the Spanish Language**

★3 (fi 6) (either term, 3-0-0). Focus on the history of Spanish and on different dialects spoken in the Americas. Students will broaden their knowledge of the development of Spanish phonology and grammar and the evolution of the language in the Americas. Prerequisite: SPAN 300 or 306 or consent of Department

**SPAN 399 Special Topics**

★3 (fi 6) (either term, 3-0-0). Prerequisite: SPAN 300 or 306 or consent of Department.

**SPAN 405 Exercises in Translation: Spanish into English**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★3 at the 300-level numbered above 306 or consent of Department. Note: This course can also be applied to the MLCS Certificate in Translation Studies.

**SPAN 406 Exercises in Translation: English into Spanish**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★3 at the 300-level numbered above 306 or consent of Department. Note: This course can also be applied to the MLCS Certificate in Translation Studies.

**SPAN 407 Advanced Grammar and Composition**

★3 (fi 6) (either term, 3-0-0). Focus on the meanings expressed by different grammatical structures in Spanish, with reference to translation differences with English. Practice of different styles of writing. Prerequisite: ★3 at the 300-level numbered above 306 or consent of Department.

**SPAN 425 Hispanic Filmmakers**

★3 (fi 6) (either term, 3-0-0). Study of one to three different Hispanic filmmakers. Prerequisite: SPAN 321 or 322 and an additional ★3 in SPAN at the 300-level excluding 300 and 306, or consent of Department.

**SPAN 440 Topics in Spanish Peninsular Literature and Culture**

★3 (fi 6) (either term, 3-0-0). Prerequisites: SPAN 321 or 322 and an additional ★3 in SPAN at the 300-level excluding 300 and 306, or consent of Department.

**SPAN 441 Reading Colonial Culture**

★3 (fi 6) (either term, 3-0-0). Colonial identities, power and ideology, mobilized through various forms of representation. Prerequisites: SPAN 321 or 322 and an additional ★3 in SPAN at the 300-level excluding 300 and 306 or consent of Department.

**SPAN 445 The Culture of Democracy**

★3 (fi 6) (either term, 3-0-0). Cultural production and its interpretation in Spain since 1976. Prerequisites: SPAN 321 or 322 and an additional ★3 in SPAN at the 300-level excluding 300 and 306, or consent of Department.

**SPAN 450 Topics in Spanish-American Literature and Culture**

★3 (fi 6) (either term, 3-0-0). Prerequisites: SPAN 321 or 322 and an additional ★3 in SPAN at the 300-level excluding 300 and 306, or consent of Department.

**SPAN 452 Indigenous America**

★3 (fi 6) (either term, 3-0-0). Representations of indigenous life and culture in Spanish America from pre-colonial times to the present. Prerequisites: SPAN 321 or 322 and an additional ★3 in SPAN at the 300-level excluding 300 and 306, or consent of Department.

**SPAN 455 Literature, War and Revolution in Spanish America**

★3 (fi 6) (either term, 3-0-0). From European conquest to the twentieth-century revolutions and liberation movements. Prerequisites: SPAN 321 or 322 and an additional ★3 in SPAN at the 300-level excluding 300 and 306, or consent of Department.

**SPAN 456 Constructing the Nation**

★3 (fi 6) (either term, 3-0-0). How Spanish-American Nations were constructed, imagined, and represented during the 19th century through a variety of textual and visual media. Prerequisite: SPAN 321 or 322 and an additional ★3 in SPAN at the 300-level excluding 300 and 306, or consent of Department.

**SPAN 457 Post-dictatorship Culture in the Southern Cone**

★3 (fi 6) (either term, 3-0-0). Cultural production and consumption in Argentina, Chile and Uruguay since the mid-1980s. Prerequisites: SPAN 321 or 322 and an additional ★3 in SPAN at the 300-level excluding 300 and 306, or consent of Department.

**SPAN 460 Self Portraits in Writing**

★3 (fi 6) (either term, 3-0-0). Testimonial writing, biography and autobiography, memoirs, correspondence, diaries, interviews, and confessions. Prerequisites: SPAN 321 or 322 and an additional ★3 in SPAN at the 300-level excluding 300 and 306, or consent of Department.

**SPAN 475 Spanish in Society**

★3 (fi 6) (either term, 3-0-0). Language as a social phenomenon. Description of dialects in Spanish. Language shift, bilingualism, language attrition, code-switching and language attitudes. Prerequisite: ★3 in SPAN at the 300-level excluding 300 and 306 or consent of Department.

**SPAN 476 The Acquisition of Spanish**

★3 (fi 6) (either term, 3-0-0). Issues relating to the acquisition of Spanish as a second language, education and language policies, and language pedagogy in the literature and in practice. Prerequisite: ★3 in SPAN at the 300-level excluding 300 and 306, or consent of Department.

**SPAN 478 Issues in Teaching Spanish**

★3 (fi 6) (either term, 3-0-0). Issues relevant to teaching Spanish as a second language to adult learners. Prerequisite: ★3 in SPAN at the 300-level excluding 300 and 306, or consent of Department.

**SPAN 495 Honors Thesis**

★3 (fi 6) (either term, 0-3s-0).

**SPAN 499 Special Topics**

★3 (fi 6) (either term, 3-0-0).

**Graduate Courses****SPAN 524 Hispanic Theories of Cultural Studies**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

**SPAN 530 Visual Arts and Literature**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department.

**SPAN 531 Foundations of Hispanic Literature**

★3 (fi 6) (either term, 3-0-0).

**SPAN 535 Topics in Hispanic Culture**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**SPAN 536 Visions of Post - Revolutionary Mexico**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**SPAN 538 Nationalizing the Modern: Tensions in the Latin American Avant-gardes**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**SPAN 539 Fashioning and Representing the Self in Early Modern Spain**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**SPAN 543 Boom and Bust in Latin American Literature**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**SPAN 575 Spanish in Society**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**SPAN 576 The Acquisition of Spanish**★3 (*fi 6*) (either term, 3-0-0). Prerequisite: consent of Department.**SPAN 578 Issues in Teaching Spanish**★3 (*fi 6*) (either term, 3-0-0). Prerequisite: consent of Department.**SPAN 599 Directed Reading**★3 (*fi 6*) (either term, 3-0-0).**SPAN 615 Latin American Film in Theory and Context**★3 (*fi 6*) (either term, 0-3s-0).**SPAN 698 Topics in Spanish Linguistics**★3 (*fi 6*) (either term, 3-0-0).**SPAN 699 Topics in Spanish Literature and Culture**★3 (*fi 6*) (either term, 3-0-0).

## 231.259 Speech Pathology and Audiology, SPA

Department of Speech Pathology and Audiology  
Faculty of Rehabilitation Medicine**Note:** All SPA courses are open to SPA students only.

### Graduate Courses

**SPA 501 Clinical Research Methods**★3 (*fi 6*) (either term, 3-0-0). Investigation of strategies for demonstrating scientifically the impact of clinical intervention programs, both for accountability and for contributing to the knowledge base regarding effective treatment. Students will be advised to approach staff members as resources for development of specific projects in anticipation of SPA 900. (Restricted to MScSLP students only.)**SPA 502 Anatomy and Physiology of the Speech Mechanism**★4 (*fi 8*) (first term, 4-0-2). Lectures and demonstrations provide a systematic study of the gross anatomy and neuroanatomy of the respiratory, phonatory, resonatory, and articulatory subsystems and the physiology of respiration, phonation, and upper airway in speech production and swallowing. The embryological and post-natal development of these systems is considered. Review of the neural substrates underlying speech and language processing is included. Laboratories provide observational and simulated dissection experiences using computer software video, anatomical models, and prosected materials. (Restricted to MScSLP students only.)**SPA 505 Speech Science**★3 (*fi 6*) (first term, 3-0-1). Study of theoretical and applied aspects of acoustic phonetics, speech perception and speech production, including theory and application of methods (physiological, acoustic and perceptual) to record and analyze speech behaviors. Provides students with basic knowledge for entry into the field of speech-language pathology. Pre- or corequisites: SPA 502 or equivalent, SPA 507 and 515. (Restricted to MScSLP students only.)**SPA 507 Phonological Disorders**★3 (*fi 6*) (either term, 3-0-2). In-depth study of the nature, assessment and remediation of articulatory/phonological disorders according to various theoretical models. Emphasis will be placed on phonologically based clinical approaches including phonological process analysis and generative phonology. Practical experience in assessment and remediation will be provided through clinical observation and laboratory experiences. (Restricted to MScSLP students only.)**SPA 509 Motor Speech Disorders**★3 (*fi 6*) (either term, 0-4L-1). Study of dysarthria and dyspraxia (congenital and acquired) including the nature of their underlying neuropathologies, methods of instrumental and perceptual assessment, and systematic instrumental and behavioral management strategies. Students will develop their understanding of the course material via a series of clinical problem solving and treatment planning exercises. Prerequisites: SPA 502 or equivalent and SPA 505, 507, 511. Pre- or corequisite: SPA 520. (Restricted to MScSLP students only.)**SPA 511 Child Language Development and Assessment**★3 (*fi 6*) (either term, 0-4L-1). A review of normal language development provides the basis for a comprehensive study of the assessment and identification of children with language disorders. Assessment procedures involve language test administration and interpretation. Discussion of research findings highlights disordered language behaviors associated with such problems as mental retardation, emotional problems, and learning disabilities. The laboratory provides experience in administering a variety of language tests. (Restricted to MScSLP students only.)**SPA 515 Hearing Science/Audiology**★3 (*fi 6*) (first term, 3-0-1). Study of basic audiology for speech-language pathologists. Includes anatomy and physiology of the auditory and vestibular systems, theories of hearing, the physics and measurement of sound (including psychophysical methods and psychoacoustics), symptoms, etiology and prognosis of hearing disorders, overview of assessment procedures and instrumentation used

in diagnostic audiology, and application of audiometric results to speech-language pathology. Proficiency in hearing and tympanometry screening, including care and maintenance of equipment, is acquired in laboratory sessions. Prerequisites or corequisites: SPA 502. (Restricted to MScSLP students only.)

**SPA 516 Diagnosis and Appraisal of Communication Disorders**★3 (*fi 6*) (either term, 3-0-1). A study of the principles underlying the evaluative and management procedures in communication disorders. History taking, report writing, recording observations, analysis of tests relevant to the clinical process and test procedure administration will be covered. Corequisite: SPA 524. (Restricted to MScSLP students only.)**SPA 518 Remediation of Child Language Disorders**★3 (*fi 6*) (either term, 0-4L-1). A study of the theoretical models of intervention and clinical application in remediating children's disordered language patterns. Specific attention focused toward commercial and clinician-generated programs that serve these various theoretical frameworks. Discussion of language goals, intervention strategies and accountability measures that serve to guide the therapeutic process and determine treatment effectiveness. The laboratory provides opportunity to observe therapy and design sample language therapy units. Prerequisite: SPA 511. (Restricted to MScSLP students only.)**SPA 520 Adult Language Disorders I**★3 (*fi 6*) (either term, 0-4L-0). Study of acquired aphasia including the nature of the underlying neuropathologies, methods of differential diagnosis and comprehensive assessment, and clinically-pertinent behavioral management strategies. Students will develop their understanding of the course material via a series of clinical problem solving and treatment planning exercises. Prerequisite: SPA 502 or equivalent. (Restricted to MScSLP students only.)**SPA 521 Dysphagia**★3 (*fi 6*) (either term, 0-3L-0). Students will understand bases of normal and abnormal feeding and swallowing in children and adults, etiologies and conditions commonly associated with dysphagia, principles and procedures for diagnosis and treatment across age spans and conditions and complications associated with management; and be able to develop remediation plans and functional goals within an interdisciplinary team framework. Prerequisite: SPA 502 or equivalent. (Restricted to MScSLP students.)**SPA 523 Augmentative/Alternative Communication Systems**★1.5 (*fi 3*) (either term, 0-2L-0). This course will provide a description of various augmentative/alternative communication systems, including microcomputers. It will address assessment questions and the intervention process for individual users with communication disorders. Prerequisite: SPA 518. (Restricted to MScSLP students only.)**SPA 524 Introduction to Clinical Practicum I**★7.5 (*fi 15*) (two term, 0-8c-2). Credit. Practical application of clinical procedures under direct supervision. Normally, students will possess an academic background enabling them to assume direct treatment responsibilities with children and adults having disorders of articulation and/or language. A minimum of 48 direct contact hours as well as simulated and indirect contact hours will be accrued. Seminar content will include topics of clinical and/or professional significance such as ethics, health law, private practice, goal setting and data collection. Flexibility in seminar topics will accommodate new topics as they arise. Prerequisites: At least six MScSLP courses including SPA 507, 511, 518. Corequisite: SPA 516. (Restricted to MScSLP students only.)**SPA 525 Introduction to Clinical Practicum II**★2 (*fi 4*) (either term, 0-2c-0). Credit. Continued practical application of clinical procedures under direct supervision. Normally students will acquire experience with alternative service delivery models such as group treatment. A minimum of 25 direct contact hours as well as simulated and indirect contact hours will be accrued. Prerequisite: SPA 524. (Restricted to MScSLP students only.)**SPA 526 Voice and Resonance Disorders**★3 (*fi 6*) (either term, 3-0-1). A study of the causes, nature, clinical assessment, and management of voice and resonance disorders. Prerequisites: SPA 502 and SPA 505. (Restricted to MScSLP students only.)**SPA 527 Language and Literacy**★3 (*fi 6*) (either term, 0-4L-0). Study of language development in school-age children and adolescents, with focus on the relationships among oral language, reading, and writing; linguistic tasks faced by these age groups in school and elsewhere; and implications for language assessment and intervention. Prerequisites: SPA 511 and 518. (Restricted to MScSLP students only.)**SPA 528 Fluency**★3 (*fi 6*) (either term, 3-0-1). A study of the development, nature and treatment of stuttering with particular emphasis on management strategies. Pre- or corequisite: SPA 501. (Restricted to MScSLP students only.)**SPA 529 Adult Language Disorders II**★3 (*fi 6*) (either term, 0-4L-0). Study of conditions (other than aphasia) affecting language, social, and cognitive functioning in adults, including traumatic brain injury, dementia, and right hemisphere dysfunction, and issues related to the aging process. Nature of underlying neuropathologies and their implications for

differential diagnosis, assessment, and management will be addressed. Prerequisite: SPA 520. (Restricted to MScSLP students only.)

#### SPA 532 Advanced Clinical Practicum

★4.5 (*fi 9*) (either term, 0-12c-0). Credit. Full-time supervised clinical practice normally for a period of six weeks in an approved clinical service facility. Students will have completed all academic course work and will be prepared to work with a broad range of communication disorders under reduced supervision. A minimum of 75 direct contact hours as well as simulated and indirect contact hours will be accrued. Prerequisites: SPA 525 and all MScSLP academic courses. (Restricted to MScSLP students only.)

#### SPA 533 Advanced Clinical Practicum

★4.5 (*fi 9*) (either term, 0-12c-0). Credit. Full-time supervised clinical practice normally for a period of six weeks in an approved clinical service facility. Students will have completed all academic course work and will be prepared to work with a broad range of communication disorders under reduced supervision. A minimum of 75 direct contact hours as well as simulated and indirect contact hours will be accrued. Prerequisites: SPA 525 and all MScSLP academic courses. (Restricted to MScSLP students only.)

#### SPA 534 Aural (Re)habilitation

★3 (*fi 6*) (either term, 0-4L-0). Study of the diagnostic and treatment strategies for communication problems associated with childhood and adult onset hearing loss. Prerequisites: SPA 505, 507, 511 and 515. (Restricted to MScSLP students only.)

#### SPA 540 Advanced Clinical Practicum

★4.5 (*fi 9*) (either term, 0-12c-0). Credit. Full-time supervised clinical practice normally for a period of six weeks in an approved clinical service facility. Students will have completed all academic course work and will be prepared to work with a broad range of communication disorders under reduced supervision. A minimum of 75 direct contact hours as well as simulated and indirect contact hours will be accrued. Prerequisites: SPA 532 and 533. (Restricted to MScSLP students only.)

#### SPA 541 Advanced Clinical Practicum

★4.5 (*fi 9*) (either term, 0-12c-0). Credit. Full-time supervised clinical practice normally for a period of six weeks in an approved clinical service facility. Students will have completed all academic course work and will be prepared to work with a broad range of communication disorders under reduced supervision. A minimum of 75 direct contact hours as well as simulated and indirect contact hours will be accrued. Prerequisites: SPA 532 and 533. (Restricted to MScSLP students only.)

#### SPA 597 Advanced Clinical Practicum

★1-4.5 (*variable*) (either term, variable). May be repeated. Credit. Full-time supervised clinical practice for a period varying from four to twelve weeks in an approved clinical service facility. Students will have completed all academic course work and will be prepared to work with a broad range of communication disorders under reduced supervision. Direct contact hours as well as simulated and indirect contact hours will be accrued. Prerequisite: SPA 516 and 524 and permission of the department. (Restricted to MScSLP students only.)

#### SPA 598 Directed Individual Reading and Research

★1-12 (*variable*) (either term, variable). May be repeated. Prerequisite: consent of Department. (MScSLP)

#### SPA 900 Directed Research Project

★3 (*fi 6*) (either term or Spring/Summer, 0-3s-0). Required capping exercise for the MScSLP program. Intended to develop students' inquiry, reflection, critical thinking, and writing skills and to provide a supervised experience in the disciplined investigation of a problem. Prerequisites: SPA 501. (Restricted to MScSLP students only.)

## 231.260 Statistics, STAT

Department of Mathematical and Statistical Sciences  
Faculty of Science

**Note:** Statistical software packages will normally be used in courses that contain data analysis.

### Undergraduate Courses

#### 0 STAT 141 Introduction to Statistics

★3 (*fi 6*) (either term, 3-0-0). Random variables and frequency distributions. Averages and variance. The binomial and normal distribution. Sampling distributions and elementary inference. X<sup>2</sup>-test for contingency tables. Regression and correlation. Analysis of variance. Prerequisite: Pure Mathematics 30 or Mathematics 30-1 or consent of Department. This course may not be taken for credit if credit has been obtained in any STAT course, or in PSYCO 211 or SOC 210.

#### 0 STAT 151 Introduction to Applied Statistics I

★3 (*fi 6*) (either term, 3-0-1.5). Data collection and presentation, descriptive statistics. Probability distributions, sampling distributions and the central limit theorem. Point estimation and hypothesis testing. Correlation and regression

analysis. Goodness of fit and contingency table. Prerequisite: Pure MATH 30 or MATH 30-1. This course may not be taken for credit if credit has been obtained in any STAT course, or in PSYCO 211 or SOC 210.

#### STAT 221 Applied Probability

★3 (*fi 6*) (either term, 3-0-2). Probability models; distribution of one and two random variables; moment generating functions; specific distributions; uniform, binomial, geometric, Poisson, exponential, normal, etc. Markov chains and simple queues. Various applications are considered with emphasis on the analysis of computer systems; simulation techniques are used and the algorithmic approach is used throughout the course. Restricted to Honors and Specialization students in Computing Science and Specialization students in Computational Science (Mathematics). Prerequisites: MATH 115 or equivalent; pre- or corequisite: MATH 120 or 125 or equivalent. Credit may not be obtained for both STAT 221 and STAT 265.

#### STAT 222 Applied Statistics

★3 (*fi 6*) (either term, 3-0-2). Sampling distributions; estimation; hypothesis testing; linear regression. Poisson process; simple queues; models and applications which are primarily of interest to computing scientists. Prerequisite: STAT 221. Note: Credit may be obtained for at most one of STAT 222, 266 and 366.

#### STAT 235 Introductory Statistics for Engineering

★3.8 (*fi 6*) (either term or Spring/Summer, 3-0-1.5). Descriptive data analysis. Calculus of Probability. Binomial, multinomial, Poisson, normal, beta, exponential, gamma, hypergeometric, and Weibull distributions. Sampling distributions. Estimation, testing hypotheses, goodness-of-fit tests, and one-way analysis of variance. Linear correlation and regression. Sampling. Quality control. Use of a microcomputer software package for statistical analyses in engineering applications. Prerequisite: MATH 100. Corequisite: MATH 101. Credit may not be obtained in STAT 235 if credit has already been obtained in STAT 141, 151, 222, 265, 266; PSYCO 211 or SOC 210. Intended for Engineering students. Other students who take this course will receive ★3.0.

#### 0 STAT 252 Introduction to Applied Statistics II

★3 (*fi 6*) (either term, 3-0-2). Methods in applied statistics including regression techniques, analysis of variance and covariance, and methods of data analysis. Applications are taken from Biological, Physical and Social Sciences, and Business. Credit may be received in at most one of STAT 252, 319, 337, or 341. Prerequisite: STAT 141 or 151 or equivalent.

#### 0 STAT 265 Statistics I

★3 (*fi 6*) (first term, 3-0-1). Sample space, events, combinatorial probability, conditional probability, independent events, Bayes Theorem, random variables, discrete random variables, expected values, moment generating function, inequalities, continuous distributions, multivariate distributions, independence. Prerequisite: MATH 115 or SCI 100. Corequisite: MATH 214. Credit may not be obtained for both STAT 265 and STAT 221.

#### 0 STAT 266 Statistics II

★3 (*fi 6*) (second term, 3-0-1). Functions of random variables, sampling distributions, Central Limit Theorem, law of large numbers, statistical models for the data, likelihood, parameters and their interpretation, objectives of statistical inference, point and interval estimation, method of moments, basic notions of testing of hypotheses, errors of the first and second kind, significance level, power, p-value. Prerequisites: STAT 265, MATH 214 and 225. Co-requisite: MATH 215. Credit may not be obtained for both STAT 266 and either of STAT 222 or STAT 366.

#### 0 STAT 312 Mathematical Methods in Statistics

★3 (*fi 6*) (either term, 3-0-1). Reviews and extends those topics in the prerequisite courses in calculus and linear algebra which are of particular interest in Mathematical Statistics. These include the basics of mathematical reasoning as evidenced by the presentation of rigorous arguments, notions of continuity, differentiation, Riemann-Stieltjes integration and numerical optimization, and diagonalization results for real symmetric matrices. Applications to statistical theory will include least squares estimation, generating functions, and distribution theory. Prerequisites: MATH 215, 225.

#### 0 STAT 335 Statistical Quality Control and Industrial Statistics

★3 (*fi 6*) (either term, 3-0-0). Control charts for variables and attributes. Process capability analysis. Acceptance sampling: single and multiple attribute and variable acceptance plans. Prerequisite: STAT 235 or 265.

#### 0 STAT 337 Biostatistics

★3 (*fi 6*) (first term, 3-0-2). Methods of data analysis useful in Biostatistics including analysis of variance and covariance and nested designs, multiple regression, logistic regression and log-linear models. The concepts will be motivated by problems in the life sciences. Applications to real data will be emphasized through the use of a computer package. Prerequisite: STAT 151 and a 200-level Biological Science course. Note: This course may not be taken for credit if credit has already been obtained in STAT 252, 368 or 378.

#### 0 STAT 353 Life Contingencies I

★3 (*fi 6*) (either term, 3-0-0). Time at death random variables, continuous and discrete insurances, endowments and varying annuities, net premiums and reserves. Prerequisites: MATH 253 and STAT 265. Corequisite: MATH 215.



**STAT 354 Life Contingencies II**

★3 (fi 6) (either term, 3-0-0). Analysis of benefits reserves, multiple life functions, multiple decrement models, applications of multiple decrement theory. Prerequisite: STAT 353. May be offered in alternate years.

**STAT 355 Casualty Insurance**

★3 (fi 6) (either term, 3-0-0). Utility theory, insurability of risk, the economics of insurance, the ratemaking process, IBNR and chain ladder method, property/casualty loss reserving techniques. Prerequisite: MATH 215, 253, and STAT 265. May be offered in alternate years.

**STAT 361 Sampling Techniques**

★3 (fi 6) (either term, 3-0-0). Simple random sampling from finite populations, stratified sampling, regression estimators, cluster sampling. Note: This course may only be offered in alternate years. Prerequisite: STAT 266.

**STAT 368 Introduction to Design and Analysis of Experiments**

★3 (fi 6) (either term, 3-0-0). Basic principles of experimental design, completely randomized design—one way ANOVA and ANCOVA, randomized block design, Latin square design, Multiple comparisons. Nested designs. Factorial experiments. Prerequisites: STAT 266 and a course in Linear Algebra; MATH 225 recommended.

**STAT 371 Probability and Stochastic Processes**

★3 (fi 6) (either term, 3-0-0). Problem solving of classical probability questions, random walk, gambler's ruin, Markov chains, branching processes. Selected topics of the instructor's choice. Prerequisite: STAT 265.

**STAT 372 Mathematical Statistics**

★3 (fi 6) (either term, 3-0-0). Laws of large numbers, weak convergence, some asymptotic results, delta method, maximum likelihood estimation, testing, UMP tests, LR tests, nonparametric methods (sign test, rank test), robustness, statistics and their sensitivity properties, prior and posterior distributions, Bayesian inference, conjugate priors, Bayes estimators. Prerequisites: STAT 266, STAT 312.

**STAT 378 Applied Regression Analysis**

★3 (fi 6) (either term, 3-0-0). Simple linear regression analysis, inference on regression parameters, residual analysis, prediction intervals, weighted least squares. Multiple regression analysis, inference about regression parameters, multicollinearity and its effects, indicator variables, selection of independent variables. Non-linear regression. Prerequisites: STAT 266 and a course in Linear Algebra; Corequisite: STAT 312; MATH 225 recommended.

**STAT 400 Industrial Internship Practicum**

★3 (fi 6) (first term, 0-3s-0). Required by all students who have just completed a Mathematical Sciences Industrial Internship Program and who are in an Honors or Specialization degree in Statistics. Must be completed during the first academic term following return to full-time studies. Note: A grade of F to A+ will be determined by the student's job performance as evaluated by the employer, by the student's performance in the completion of an internship practicum report, and by the student's ability to learn from the experiences of the Internship as demonstrated in an oral presentation. Prerequisite: WKEXP 953.

**STAT 432 Survival Analysis**

★3 (fi 6) (either term, 3-0-0). Survival models, model estimation from complete and incomplete data samples, parametric survival models with concomitant variables, estimation of life tables from general population data. Prerequisite: STAT 266, 312.

**STAT 441 Applied Statistical Methods for Data Mining**

★3 (fi 6) (either term, 3-0-1). Principles of statistical model building and analysis applied in linear and generalized linear models and illustrated through multivariate methods such as repeated measures, principal components, and supervised and unsupervised classification. Prerequisites: MATH 120 or 125 or equivalent, STAT 252 or 337 or MGTSC 312 or equivalent, and a 300-level course in an area of application.

**STAT 453 Risk Theory**

★3 (fi 6) (either term, 3-0-0). Classical ruin theory, individual risk models, collective risk models, models for loss severity: parametric models, tail behavior, models for loss frequency, mixed Poisson models; compound Poisson models, convolutions and recursive methods, probability and moment generating functions. Prerequisite: STAT 266.

**STAT 454 Topics in Actuarial Science**

★3 (fi 6) (either term, 3-0-0). Topics in actuarial mathematics, as selected by the instructor. Prerequisite: STAT 353 or MATH 353. This course may be offered in alternate years.

**STAT 455 Loss Model and Credibility Theory**

★3 (fi 6) (either term, 3-0-0). Credibility theory: limited fluctuation; Bayesian; Buhlmann, Buhlmann-Straub; empirical Bayes parameter estimation; statistical inference for loss models; maximum likelihood estimation; effect of policy modifications; model selection. Prerequisite: STAT 453. This course may be offered in alternate years.

**STAT 471 Probability I**

★3 (fi 6) (first term, 3-0-0). Probability spaces, algebra of events. Elements of

combinatorial analysis. Conditional probability, stochastic independence. Special discrete and continuous distributions. Random variables, moments, transformations. Basic limit theorems. Prerequisite: STAT 312, 371.

**STAT 472 Probability II**

★3 (fi 6) (second term, 3-0-0). Sequences of Bernoulli trials, laws of large numbers, normal approximations. Generating functions, recurrent events, random walks. Introduction to Markov chains. Special topics. Prerequisite: STAT 471.

**STAT 479 Time Series Analysis**

★3 (fi 6) (either term, 3-0-0). Stationary series, spectral analysis, models in time series: autoregressive, moving average, ARMA and ARIMA. Smoothing series, computational techniques and computer packages for time series. Note: This course may be offered only in alternate years. Prerequisite: STAT 312, 372 and 378.

**Graduate Courses****STAT 501 Directed Study I**

★3 (fi 6) (either term, 3-0-0). Basic principles of experimental design, completely randomized design—one way ANOVA and ANCOVA. Randomized block design. Latin square design, Multiple comparisons. Nested designs. Factorial experiments. Each student will give a written report and seminar presentation highlighting statistical methods used in a research project. Prerequisites: STAT 252 or 337 or equivalent and a course in linear algebra. Note: Not open to graduate students in the Department of Mathematical and Statistical Sciences.

**STAT 502 Directed Study II**

★3 (fi 6) (either term, 3-0-0). Simple linear regression analysis, inference on regression parameters, residual analysis, prediction intervals, weighted least squares. Multiple regression analysis, inference about regression parameters, multicollinearity and its effects, indicator variables, selection of independent variables. Non-linear regression. Each student will give a written report and seminar presentation highlighting statistical methods used in a research project. Prerequisite: STAT 337 or equivalent and a course in linear algebra. Note: Not open to graduate students in the Department of Mathematical and Statistical Sciences.

**STAT 503 Directed Study III**

★3 (fi 6) (either term, 3-0-0). Theory and applications of time series modelling, stationarity, autocorrelation. Spectral properties, filtering. Box-Jenkins models, seasonality. Each student will give a written report and seminar presentation highlighting statistical methods used in a research project. Prerequisite: STAT 372 and 378 or consent of Instructor.

**STAT 504 Directed Study IV**

★3 (fi 6) (either term, 3-0-0). Basic sampling schemes for finite populations: simple random sampling, stratified random sampling, systematic sampling and cluster sampling. Unequal probability sampling. Ratio and regression estimators. Prerequisite: A course in Statistical Inference at the 300 level or permission from the instructor. Note: Not open to graduate students in the Department of Mathematical and Statistical Sciences.

**STAT 505 Directed Study V**

★3 (fi 6) (either term, 3-0-0). Principles of statistical model building and analysis applied in linear and generalized linear models and illustrated through multivariate methods such as repeated measures, principal components, and supervised and unsupervised classification. Each student will give a written report and seminar presentation highlighting statistical methods used in a research project. Prerequisites: A course in linear algebra and one of STAT 501, 502 or equivalent. Note: Not open to graduate students in the Department of Mathematical and Statistical Sciences.

**STAT 512 Techniques of Mathematics for Statistics**

★3 (fi 6) (either term, 3-0-0). Introduction to mathematical techniques commonly used in theoretical Statistics, with applications. Applications of diagonalization results for real symmetric matrices, and of continuity, differentiation, Riemann-Stieltjes integration and multivariable calculus to the theory of Statistics including least squares estimation, generating functions, distribution theory. Prerequisite: consent of Department.

**STAT 532 Survival Analysis**

★3 (fi 6) (either term, 3-0-0). Survival and hazard functions, censoring, truncation. Non-parametric, parametric and semi-parametric approaches to survival analysis including Kaplan-Meier estimation and Cox's proportional hazards model. Prerequisite: STAT 372 or consent of Department.

**STAT 553 Risk Theory**

★3 (fi 6) (either term, 3-0-0). Classical ruin theory, individual risk models, collective risk models, models for loss severity: parametric models, tail behavior, models for loss frequency, mixed Poisson models; compound Poisson models, convolutions and recursive methods, probability and moment generating functions. Prerequisite: Consent of the Department.

**STAT 554 Topics in Actuarial Science**

★3 (fi 6) (either term, 3-0-0). Topics in actuarial mathematics, as selected by the instructor. Prerequisite: Consent of the Department.

**STAT 555 Loss Model and Credibility Theory**

★3 (fi 6) (either term, 3-0-0). Credibility theory: limited fluctuation; Bayesian; Buhlmann, Buhlmann-Straub; empirical Bayes parameter estimation; statistical inference for loss models; maximum likelihood estimation; effect of policy modifications; model selection. Prerequisite: Consent of the Department.

**STAT 556 Topics in Applied Statistics**

★3 (fi 6) (either term, 3-0-0). The contents will be selected each year from applied topics.

**STAT 561 Sample Survey Methodology**

★3 (fi 6) (either term, 3-0-0). Review of basic sampling schemes: simple random sampling, and stratified random sampling, and systematic sampling. Multistage sampling schemes. Estimation of nonlinear parameters: ratios, regression coefficients, and correlation coefficients. Variance estimation techniques: linearization, BRR, jackknife, and bootstrap. Selected topics: model-based estimation, regression analysis from complex survey data. Relevant computer packages. Prerequisites: STAT 361, 372, 471.

**STAT 562 Discrete Data Analysis**

★3 (fi 6) (either term, 3-0-0). Sampling models and methods of inference for discrete data. Maximum likelihood estimation for complete contingency tables, measures of association and agreement. Goodness-of-fit. Incomplete tables. Analysis of square tables; symmetry and marginal homogeneity. Model selection and closeness of fit; practical aspects. Chi-square tests for categorical data from complex surveys. Prerequisite: STAT 372 or 471.

**STAT 566 Methods of Statistical Inference**

★3 (fi 6) (either term, 3-0-0). An introduction to the theory of statistical inference. Topics to include exponential families and general linear models, likelihood, sufficiency, ancillarity, interval and point estimation, asymptotic approximations. Optional topics as time allows, may include Bayesian methods, Robustness, resampling techniques. This course is intended primarily for MSc students. Prerequisite: STAT 471 or consent of Department.

**STAT 568 Design and Analysis of Experiments**

★3 (fi 6) (either term, 3-0-0). The general linear model. Fully randomized designs, one-way layout, multiple comparisons. Block designs, Latin squares. Factorial designs confounding, fractions. Nested designs, randomization restrictions. Response surface methodology. Analysis of covariance. Prerequisite: STAT 368 and a 400-level STAT course.

**STAT 571 Probability and Measure**

★3 (fi 6) (either term, 3-0-0). Measure and integration, Laws of Large Numbers, convergence of probability measures. Conditional expectation as time permits. Prerequisites: STAT 471 and STAT 512 or their equivalents.

**STAT 575 Multivariate Analysis**

★3 (fi 6) (either term, 3-0-0). The multivariate normal distribution, multivariate regression and analysis of variance, classification, canonical correlation, principal components, factor analysis. Prerequisite: consent of Department.

**STAT 578 Regression Analysis**

★3 (fi 6) (either term, 3-0-0). Multiple linear regression, ordinary and generalized least squares, partial and multiple correlation. Regression diagnostics, collinearity, model building. Nonlinear regression. Selected topics: robust and nonparametric regression, measurement error models. Prerequisites: STAT 378 and a 400-level statistics course.

**STAT 580 Stochastic Processes**

★3 (fi 6) (either term, 3-0-0). Elements of stochastic processes. Discrete and continuous time Markov Chains; Birth and Death processes. Branching processes. Brownian Motion. General Stationary and Markov processes. Examples. Prerequisite: STAT 471 or consent of Instructor.

**STAT 590 Statistical Consulting**

★3 (fi 6) (first term, 3-0-0). Data analysis, problem solving, oral communication with clients, issues in planning experiments and collecting data; practical aspects of consulting and report writing. Prerequisite: STAT 568, 578 or their equivalents.

**STAT 600 Reading in Statistics**

★3 (fi 6) (either term, 3-0-0). Students will be supervised by an individual staff member to participate in areas of research interest of that staff member. Students can register only with the permission of the Chair of the Department in special circumstances. Will not be counted toward the minimum course requirement for graduate credits.

**STAT 664 Advanced Statistical Inference**

★3 (fi 6) (either term, 3-0-0). Modern methods of statistical inference. Various versions of likelihood: conditional, marginal, integrated, profile, partial, empirical. Estimating equations. Semi-parametric models. Foundational issues. Prerequisites: STAT 512 and 566.

**STAT 665 Asymptotic Methods in Statistical Inference**

★3 (fi 6) (either term, 3-0-0). Approximation techniques and asymptotic methods in statistics. Topics may include second and higher order expansions, asymptotics of likelihood based estimation and testing. Edgeworth expansions, exponential

tilting, asymptotic relative efficiency, U-, M-, L-, and R-estimation. Prerequisites: STAT 566 or 664 and 512 or the equivalent.

**STAT 671 Probability Theory I**

★3 (fi 6) (either term, 3-0-0). Zero-one laws, sums of independent random variables, three-series criterion, laws of iterated logarithm, laws of large numbers, convergence in distribution, characteristic functions. Bochner's theorem, central limit theorems, discrete time martingales. Prerequisite: STAT 571 or MATH 563 or equivalent.

**STAT 672 Probability Theory II**

★3 (fi 6) (either term, 3-0-0). Martingales and martingale inequalities, stopping theorems, local martingales, quadratic variation. Wiener and Poisson processes, stochastic integration. Ito's formula, semimartingales, Girsanov's theorem, introduction to stochastic differential equations, Markov processes, diffusion. Prerequisite: STAT 671 or equivalent.

**STAT 679 Time Series Analysis**

★3 (fi 6) (either term, 3-0-0). The autocorrelation function and spectrum and their estimates. Linear stationary models; autoregressive, moving average, and mixed models. Linear nonstationary models; autoregressive integrated moving average models. Forecasting. Model identification and estimation. Spectral analysis. Prerequisite: STAT 479 or equivalent.

**STAT 766 Topics in Statistics I**

★3 (fi 6) (either term, 3-0-0).

**STAT 900 Directed Research Project**

★6 (fi 12) (variable, unassigned). Open only to students taking the MSc thesis option in statistics.

## 231.261 Statistique, STATQ

Faculté Saint-Jean

### Cours de 1er cycle

**STATQ 151 Introduction à la statistique appliquée I**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-2). Collecte de données et leur présentation, statistiques descriptives. Loi de probabilité, distribution d'échantillonnage et théorème limite central, estimation ponctuelle et tests d'hypothèses. Corrélation et régression linéaire simple. Mesure d'ajustement et tableaux de contingences. Préalable(s): Mathématiques 30. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour un cours de STAT, PSYCO 211, SCSOC 322, ou SOC 210.

**STATQ 235 Introduction à la statistique pour scientifiques et ingénieurs**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-3/2). Analyse de données descriptive. Calculs de probabilité. Distributions binomiale, multinomiale, de Poisson, normale, bêta, exponentielle, gamma, hypergéométrique et de Weibul. Distributions d'échantillonnage. Estimation, test d'hypothèses, qualité de l'ajustement et analyse de la variance à un facteur. Corrélation linéaire et régression. Échantillonnage. Gestion de la qualité. Utilisation de progiciel pour des analyses statistiques et des applications pratiques. Préalable : MATHQ 100. Concomitant : MATHQ 101. Notes : (1) Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour STAT 141, 222, 265, 266, STATQ 151, PSYCO 211 ou SOC 210. (2) Les étudiants de la Faculty of Engineering obtiendront ★3.8.

## 231.262 Strategic Management and Organization, SMO

Department of Strategic Management and Organization  
Faculty of Business

### Undergraduate Courses

**SMO 200 Introduction to Management for Non-Business Students**

★3 (fi 6) (either term, 3-0-0). Provides an understanding of the behavior of individuals and groups within the context of the business organization. Topics covered include organizational structure, culture, individual differences, personality, motivation, leadership, groups, decision making, power, politics, conflict, careers, stress, and organizational change. Not for credit in the Bachelor of Commerce program. Not to be taken by students with credit in SMO 101, 201 or 301.

**SMO 201 Introduction to Management**

★3 (fi 6) (either term, 3-0-0). Introduces students to the behavioral, political and organizational dynamics of managerial practice. Topics include management theory, social responsibility, ethics, motivation, decision making, leadership, organizational structure, and strategy. Not to be taken by students with credit in SMO 200 or 301.

**SMO 301 Behavior in Organizations**

★3 (fi 6) (either term, 3-0-0). Provides an understanding of the behavior of

individuals in organizations. Draws from psychology, sociology, organization theory and covers topics such as personality, motivation, leadership, communication, conflict, and group dynamics. Prerequisite: Not open to students in the Faculty of Business. Open only to students from other faculties where the course is a requirement. Not to be taken by students with credit in SMO 200 or 201.

#### **SMO 311 HRM: Managing the Work Force in Canada**

★3 (fi 6) (either term, 3-0-0). This course is a general overview of human resource management issues in organizations. It focuses on reward systems, the design of work, legal issues, union-management relationships, staffing, and training and development. Prerequisite: SMO 201 or 301. Open to third- and fourth-year students.

#### **SMO 321 Introduction to Strategic Management and Organization Design**

★3 (fi 6) (either term, 3-0-0). Explores why organizations such as McDonalds, Northern Telecom, Bennetton, Wal-Mart and the University of Alberta use different patterns of organization. Examines the political and behavioral dynamics of management decision making. Prerequisite: SMO 201 or 301. Open to third- and fourth-year students.

#### **SMO 322 Theory of Organizational Behaviour**

★3 (fi 6) (either term, 3-0-0). Students who have taken introductory courses in the area will study in greater depth and detail theories of how people work in organizations. These include theories of motivation, leadership, communication, decision making, groups, conflict, change, and others selected by the instructor to cover new ways of thinking about people and organizations. Lecture, case study, and group work will normally be used. Prerequisite: SMO 201 or 301.

#### **SMO 402 Management Skills for Supervisors and Leaders**

★3 (fi 6) (either term, 3-0-0). The purpose of this course is to increase understanding of leadership roles and skill in exercising those roles. These include team building, mentoring, managing conflict, delegating, managing participative decision making, creative problem solving, and time and stress management. Prerequisite: SMO 201 or 301. Open to third- and fourth-year students.

#### **SMO 404 Interpersonal Communication and Team Management**

★3 (fi 6) (either term, 3-0-0). This course provides an understanding of interpersonal (or face-to-face) communication process and presents opportunities for personal skill development. Students should expect to engage in role play and to receive feedback on their personal style of communication. Topics include team communication, supervisory-subordinate relationships, influence and persuasion, conflict management, and performance appraisal. Prerequisite: SMO 201 or 301. Open to third- and fourth-year students.

#### **SMO 405 Gender Issues in Organizations**

★3 (fi 6) (either term, 3-0-0). This course examines the ways in which gender, personal characteristics and organizational practices interact in influencing women's and men's experiences in work settings. Among the issues discussed are gender differences in career motivation and commitment, leadership skills and ability, and conflicts between professional and personal responsibilities. Prerequisite: SMO 201 or 301. Open to third- and fourth-year students.

#### **SMO 406 Ethical Issues in Business**

★3 (fi 6) (either term, 3-0-0). This course assists students in developing and refining their personal ethical frameworks by examining issues commonly facing members of business and government organizations. A wide range of issues will be explored including discrimination, product and worker safety, environmental impacts, insider trading, and employee privacy and rights. Prerequisite: SMO 201 or 301. Open to third- and fourth-year students.

#### **SMO 407 Effective Team Management**

★3 (fi 6) (either term, 3-0-0). Modern organizations are increasingly seeing their ability to succeed as tied to their ability to better utilize human potential for innovation and creativity, primarily through the increased use of teams and small groups. Teamwork skills are required with increasing frequency, and the ability to build high performing teams is a key management competency. This includes work teams, project teams, and virtual teams. This course will focus on the factors required to transform a group of people into a high performing team. The course will integrate theory and practical skills. Students will learn how to identify healthy and unhealthy team dynamics, and explore team development activities and interventions to improve team performance. Course topics will include: effective team communication, team building, leadership and social influence, decision making processes in teams, conflict management, motivating and teams, virtual teams, and group processes. Students will be encouraged to demonstrate practical skills as well as academic learning. Students should be prepared to contribute to role plays, case studies, class presentations, virtual group experiences, and personal style assessments. Prerequisite: SMO 201 or equivalent.

#### **SMO 411 Alternative Dispute Resolution**

★3 (fi 6) (either term, 3-0-0). Conflict is a part of life which we all encounter. Disagreements occur naturally between friends, co-workers, spouses, employer and employees, organizations, and nations. Conflict is both natural and positive if handled well, but can be destructive if handled badly. This course provides detailed hands-on practical experience with various methods of conflict resolution, especially

mediation (third-party assistance) and negotiation. The course concentrates as well on the interpersonal communication skills, including assertiveness, which make effective conflict resolution possible. Prerequisite: SMO 201 or 301.

#### **SMO 412 Effective Negotiations**

★3 (fi 6) (either term, 3-0-0). This is a comprehensive study of negotiation theory and practice. A negotiation simulation is conducted to provide an understanding of how theory translates into practice. Prerequisite: SMO 201 or 301. Open to third- and fourth-year students.

#### **SMO 413 Rights in the Work Place**

★3 (fi 6) (either term, 3-0-0). This is a comprehensive study of rights in the work place. It examines principles of human resource management as guided by statutes and case law by courts and administrative tribunals. Prerequisite: SMO 201 or 301. Open to third- and fourth-year students.

#### **SMO 414 Work Force Planning**

★3 (fi 6) (either term, 3-0-0). This Human Resource Management course examines how a company interacts with the labor market to ensure that it has the right number and skill mix of employees. Part of the course involves a field research project in which students critique the work force plan of a local company. Pre- or corequisite: SMO 311. Open to third- and fourth-year students.

#### **SMO 415 Staffing**

★3 (fi 6) (either term, 3-0-0). This Human Resource Management course is focused on the philosophy and procedures used in obtaining and maintaining an efficient work force. Topics include recruitment, selection and training. Pre- or corequisite: SMO 311. Open to third- and fourth-year students.

#### **SMO 416 Performance Management and Rewards**

★3 (fi 6) (either term, 3-0-0). This Human Resource Management course focuses on how organizations create and operate a performance management system. It presents an overview of current issues in the field, such as performance evaluation, compensation planning, internal consistency, external competitiveness, individual equity, and benefits. Pre- or corequisite: SMO 311. Open to third- and fourth-year students.

#### **SMO 417 Managing the Work Force: International Perspectives**

★3 (fi 6) (either term, 3-0-0). This course comparatively explores different techniques of human resource management (HRM) used in Canada, the USA, Japan, Sweden, Germany, and France. Prerequisite: SMO 201 or 301. Open to third- and fourth-year students.

#### **SMO 418 Public Sector Employee Relations**

★3 (fi 6) (either term, 3-0-0). This Human Resource Management course examines public sector employee relations in the context of governments, public service commissions, trade unions, and administrative tribunals. It highlights public sector/private sector differences and includes a simulation of public sector labor contract negotiations. Prerequisite: SMO 201 or 301. Open to third- and fourth-year students.

#### **SMO 423 Power and Organization**

★3 (fi 6) (either term, 3-0-0). An introduction to aspects of organizational life often omitted in business courses - the role of humor, gossip, emotion and sex; the organization of time and space; the nature of the body and the construction of organizational identities - and consider their significance for understanding contemporary organizational and human resources practices. Prerequisite: Open to third- and fourth-year students only.

#### **SMO 427 Advising Family Business**

★3 (fi 6) (either term, 3-0-0). In this course students will examine some of the most salient issues facing family businesses from the perspective of a professional advisor. Case studies and recent research will be used to demonstrate how to address challenges facing family businesses in practice (e.g. communication, governance and succession issues, family conflicts and nepotism). From the perspective of advisors, students will analyze the unique competitive advantages and disadvantages of family businesses. Guest speakers who are advising family businesses or who are family business members will share their experiences relative to working with, or in, family businesses. The course will be highly interactive and students will be encouraged to discuss how to best address the weaknesses of family firms while simultaneously building their strengths. Prerequisite: SMO 201 or 301 or permission of the instructor.

#### **SMO 428 Managing Family Enterprise**

★3 (fi 6) (either term, 3-0-0). Designed to improve managerial knowledge and practice through improved recognition and understanding of the significance of family firms and of the unique challenges they face. The course is designed primarily for individuals who a) are members of a family with established business interests; b) might find themselves working for family controlled firms; c) might find themselves working in a professional capacity with family controlled firms in roles such as accountant, lawyer, banker or consultant. Prerequisite: SMO 201 or 301 or permission of the instructor.

#### **SMO 430 Introduction to Small Business Management**

★3 (fi 6) (either term, 3-0-0). Focus is specifically on issues related to the establishment of small business enterprises and particular issues related to



managing them. This course employs the knowledge already acquired in the Undergraduate Program disciplines (OA, Marketing, Finance, Accounting, etc.) and applies it to case analysis and to the study of existing small businesses in Alberta. Students should be prepared to visit small business sites and to prepare case analyses of their management systems. Prerequisites: SMO 201 or 301. Open to third- and fourth-year students.

#### **SMO 431 New Venture Creation and Organization**

★3 (*fi 6*) (either term, 3-0-0). This course explores how small businesses are created and operated. Topics include the entrepreneurial process, opportunity recognition, business planning, mobilizing resources and organization creation. Prerequisite: FIN 301, and SMO 201 or 301.

#### **SMO 432 Managing for Quality**

★3 (*fi 6*) (either term, 3-0-0). This course examines what quality management is, how it is used to improve performance, and how an organization can transform itself to a quality management orientation. In addition the history of management thought related to quality management including that of prominent figures such as Taylor, Deming, and Juran is explored. Prerequisite: SMO 201 or 301. Open to third- and fourth-year students.

#### **SMO 433 Managing Organizational Change**

★3 (*fi 6*) (either term, 3-0-0). This course examines organization change, e.g. how organizations make transitions from one state to another. There is also a focus on understanding how management goes about changing corporate culture, organization structure and management systems. Prerequisite: SMO 201 or 301. Open to third- and fourth-year students.

#### **SMO 434 Managing Professional Service Firms**

★3 (*fi 6*) (either term, 3-0-0). The course examines the managerial practices of professional service firms, with particular reference to accounting, law, engineering, and management consultancy firms. The course explores the distinctive tasks and governance structures of professional service firms and how these influence the strategic and functional (e.g. marketing, human resource management, quality control) areas of management behavior. Particular attention is given to the problem of innovation and creativity of management practice. Prerequisite: SMO 201 or 301. Open to third- and fourth-year students.

#### **SMO 435 Managing International Business**

★3 (*fi 6*) (either term, 3-0-0). This course explores issues related to managing businesses that operate in an international content. Prerequisite: SMO 201 or 301. Open to third- and fourth-year students.

#### **SMO 437 Managing Culture**

★3 (*fi 6*) (either term, 3-0-0). This course has two aims: 1) to explore how organizational and work group cultures affect the management of an organization; and 2) to explore how national culture impacts management practice and 'doing business' in foreign settings. Prerequisite: SMO 201 or 301. Open to third- and fourth-year students.

#### **SMO 438 Managing Public, Not-for-Profit Organizations**

★3 (*fi 6*) (either term, 3-0-0). Many management ideas and practices are derived from private, for-profit organizations. This course examines some of the issues confronting management in the public, voluntary and not-for-profit sectors, for example, health, education, charities, churches, cultural organization and the arts, community groups, aid agencies, etc. It addresses the issues of to what extent and how management in these types of organizations is different from the dominant private sector view of management; the extent to which practices from one sector may be adopted by another, and pressures which lead in this direction, through, for example, funding agencies. Specific issues such as the management of volunteers will also be considered. Prerequisite: SMO 201 or 301.

#### **SMO 441 Business Strategy**

★3 (*fi 6*) (either term, 3-0-0). This course examines top management decisions and emphasizes the development of business and corporate strategy. It integrates the management principles studied in the business core using a series of business cases. Guest Faculty members and executives will participate. Prerequisites: FIN 301; MARK 301; and SMO 201.

#### **SMO 442 International Family Enterprise**

★3 (*fi 6*) (either term, 3-0-0). International Family Enterprise provides an opportunity for students to investigate issues related to family enterprise in international contexts. Using a combination of theoretical information, written case studies, and presentations from guest speakers the course studies family firms from the perspective of family, ownership and business. The course allows students the opportunity to investigate how non-family businesses can best deal with family firms in other countries. The course looks at family firms operating outside Canada and the US, as well as Canadian family firms with international operations.

#### **SMO 450 Internet Strategy for Small Business**

★3 (*fi 6*) (either term, 3-0-0). This course focuses on how consultants prepare client organizations (especially small businesses and not-for-profit, volunteer organizations) for a decision as to how to include the Internet as part of their business strategy. In the initial part of the course students will familiarize themselves with the Internet as it pertains to e-business and not-for-profit uses. In the second part, students will prepare advisory reports for a real business or a not-for-profit

organization. Basic Internet skills (e-mail, browsers, using search engines, creating simple web pages) are important although tutorials will be offered for students lacking these skills. Prerequisite: MIS 311 or permission of Instructor.

#### **SMO 488 Selected Topics in Organization Theory**

★3 (*fi 6*) (either term, 3-0-0). Normally restricted to third- and fourth-year Business students. Prerequisites: SMO 201, 301 or consent of Department. Additional prerequisites may be required.

#### **SMO 490 Organizational Analysis Competition Part I**

★1.5 (*fi 3*) (either term, 0-1.5s-0). Preparation for Student Competition in Organizational Analysis. Prerequisite: consent of Instructor.

#### **SMO 491 Organizational Analysis Competition Part II**

★1.5 (*fi 3*) (either term, 0-1.5s-0). Completion of Student Competition in Organizational Analysis. Prerequisite: SMO 490 and consent of Instructor.

#### **SMO 495 Individual Research Project I**

★3 (*fi 6*) (either term, 3-0-0). Special study for advanced undergraduates. Prerequisites: consent of Instructor and Assistant Dean, Undergraduate Program.

#### **SMO 496 Individual Research Project II**

★3 (*fi 6*) (either term, 3-0-0). Special Study for advanced undergraduates. Prerequisites: SMO 495, consent of the Instructor and Assistant Dean, Undergraduate Program.

#### **SMO 497 Individual Research Project III**

★3 (*fi 6*) (either term, 3-0-0). Special Study for advanced undergraduates. Prerequisites: SMO 496, consent of the Instructor and Assistant Dean, Undergraduate Program.

## Graduate Courses

#### **SMO 500 Managing People**

★3 (*fi 6*) (either term, 3-0-0). Introduces students to organizational behavior (OB) and human resource management (HRM), and how to generate energy and commitment in employees. Examines options relevant to staffing, performance management, reward systems, leadership, motivation, decision making, communication, labor relations, and current issues in the field of management. Credit will not be given for SMO 500 when ORG A 500 or 503 or 504 have been completed.

#### **SMO 502 Organization Strategy/Managing Organizations**

★3 (*fi 6*) (either term, 3-0-0). The first part of this course examines the formation of business strategy. It recognizes the complexities and messiness of strategy formation and explores how organizations actually develop strategies. The second part examines the evolution, determinants, and relevance of alternative ways of organizing. Contemporary ideas (e.g. re-engineering, the learning organization, virtual organizations) are critically reviewed. Not open to students who have completed ORG A 501. Prerequisite: SMO 500.

#### **SMO 586 Selected Topics in Organizational Analysis**

★1.5 (*fi 3*) (either term, 3-0-0). Topics in this seminar may vary from year to year and are chosen at the discretion of the Instructor.

#### **SMO 600 From Science to Business: Translational and Entrepreneurial Challenges**

★3 (*fi 6*) (either term, 3-0-0). This is a project-focused course on technology entrepreneurship and translation. At the core of the course will be 'real life' projects that require business development analysis and assessment. Based on their projects, students will be expected to produce technology commercialization plans as a key output for the course. In addition, the course will address key strategic and policy issues related to enhancing technology entrepreneurship at the science-business interface. Topics covered include open innovation systems, the challenges associated with the bridging the gap between science and business, and the strategic management technology translation and entrepreneurship. This course is restricted to students in the Technology Commercialization specialization. Prerequisite: SMO 659.

#### **SMO 610 The Manager as Strategist**

★3 (*fi 6*) (first term, 3-0-0). This is a two week intensive course designed to develop critical thinking skills for executives. The course provides an overview of the substantive areas of management including human resources, leadership, organizational behaviour and strategy skills. Restricted to students in the FastTrack MBA for Business Graduates.

#### **SMO 612 Effective Negotiations**

★3 (*fi 6*) (either term, 3-0-0). This Human Resource Management course is a comprehensive study of negotiation theory and practice. A negotiation simulation is conducted to provide an understanding of how theory translates into practice.

#### **SMO 617 Managing the Work Force: International Perspectives**

★3 (*fi 6*) (either term, 3-0-0). This Human Resource Management course comparatively explores different systems of human resources management (HRM) that are used in Canada, the USA, Japan, Sweden, Germany, and France, and their implications for firm competitiveness. Throughout the course, the North

American experience serves as the backdrop or frame of reference for analytical discussions.

### **SMO 627 Advising Family Business**

★3 (fi 6) (either term, 3-0-0). In this course students will examine some of the most salient issues facing family businesses from the perspective of a professional advisor. Case studies and recent research will be used to demonstrate how to address fundamental challenges facing family businesses in practice (e.g. communication, governance and succession issues, family conflicts and nepotism). From the perspective of advisors, students will analyze the unique competitive advantages - and disadvantages - of family businesses. Guest speakers who are advising family businesses or who are family business members will share their unique experiences relative to working with, or in, family businesses. The course will be highly interactive and students will be encouraged to discuss how to best address the weaknesses of family firms while simultaneously building their strengths.

### **SMO 628 Managing Family Enterprise**

★3 (fi 6) (either term, 3-0-0). Designed to improve managerial knowledge and practice through improved recognition and understanding of the significance of family firms and of the unique challenges they face. Designed primarily for individuals who a) are members of a family with established business interests; b) might find themselves working for family controlled firms; c) might find themselves working in a professional capacity with family controlled firms in roles such as accountant, lawyer, banker or consultant.

### **SMO 631 New Venture Creation and Organization**

★3 (fi 6) (either term, 3-0-0). This course concentrates on the development of a new enterprise and the management of an existing small business. Casework and projects enable students to assess the opportunities, risks, and capabilities necessary for entrepreneurial success. The course emphasizes managerial and strategic problems during the early years of business formation and growth, including business planning. The course emphasizes the interface between theory and practice.

### **SMO 632 Managing for Quality**

★3 (fi 6) (either term, 3-0-0). This course examines what quality management is, how it is used to improve performance, and how an organization can transform itself to a quality management orientation. In addition, the history of management thought related to quality management including that of prominent figures such as Taylor, Deming, and Juran is explored.

### **SMO 633 Managing Organizational Change**

★3 (fi 6) (either term, 3-0-0). This course examines organization change, e.g. how organizations make transitions from one state to another. There is also a focus on understanding how management goes about changing corporate culture, organization structure and management systems.

### **SMO 634 Managing Professional Service Firms**

★3 (fi 6) (either term, 3-0-0). The course examines the managerial practices of professional service firms, with particular reference to accounting, law, engineering, and management consultancy firms. The course explores the distinctive tasks and governance structures of professional service firms and how these influence the strategic and functional (e.g. marketing; human resource management; quality control) areas of management behavior. Particular attention is given to the problem of innovation and creativity of management practice.

### **SMO 635 Managing International Business**

★3 (fi 6) (either term, 3-0-0). This course examines selected topics in managing an international business. It provides an overview of the primary issues. Additional selected topics will be chosen in consultation with the students.

### **SMO 636 Management Consulting**

★3 (fi 6) (either term, 3-0-0). This course is an introduction to the management consulting industry. It is primarily intended for those considering a possible career as a management consultant and for those looking to pursue an Internship with a consulting firm or a position with VGC. First, the course outlines the history, regulation, business models and competitive structure of the industry. Because the industry is changing quite rapidly, attention will be given to the dynamics of the industry's business models and competitive structure. Second, the course introduces participants to key practices in the consulting process, with specific attention to the analytical and diagnostic approach to the preparation of proposals and management of engagements.

### **SMO 638 Corporate Sustainability**

★3 (fi 6) (either term, 3-0-0). This course examines business strategies for sustainable development. Business sustainability is defined as managing the "triple bottom line" - designing mission driven enterprises that provide a thriving future for business, society and the planet. To achieve this, managers must adopt a fresh understanding of the role of the business enterprise. The course will draw from successful sustainability efforts of leading business organizations, both locally and internationally, by identifying key success factors that encourage sustainable business practices. It will also place current understandings of sustainability in a wider context by exploring the historical roots of current sustainability practices and examining their implications for key stakeholders of the business enterprise.

### **SMO 639 The Process of Making Public Policy**

★3 (fi 6) (either term, 3-0-0). Emphasizes a systematic and comprehensive approach to the study of developing and implementing public policy within the context of Canadian society. This course explores both the decision-making process, and such factors as the separation of powers between levels of government, electoral politics, interest groups, media and government bureaucracy as they influence the making of public policy.

### **SMO 640 Implementing Public Policy**

★3 (fi 6) (either term, 3-0-0). Examines how public policy is implemented in organizations. Topic areas will include: using new knowledge to develop policy; influencing policy; and the role of managers in effectively implementing policy. There will be a strong focus on how public sector managers can effectively design and implement change strategies that take into consideration the organizational structure, systems, leadership, culture and politics. Combines classroom discussion of theoretical concepts with practical application in organizational settings.

### **SMO 641 Business Strategy**

★3 (fi 6) (either term, 3-0-0). This course examines top management decisions and emphasizes the development of business and corporate strategy. It integrates the management principles studied in the business core using a series of business cases. Guest Faculty members and executives will participate. Prerequisite: All required Year one MBA core courses.

### **SMO 642 International Family Enterprise**

★3 (fi 6) (either term, 3-0-0). International Family Enterprise provides an opportunity for students to investigate issues related to family enterprise in international contexts. Using a combination of theoretical information, written case studies, and presentations from guest speakers the course studies family firms from the perspective of family, ownership and business. As well, since family business is a prevalent organizational form throughout the world, the course allows students the opportunity to investigate how non-family businesses can best deal with family firms in other countries. The course looks at family firms operating outside Canada and the US, as well as Canadian family firms with international operations and addresses the following general questions: What are the key organizational and strategic issues for family businesses in other countries? How can we best understand the combination of family, ownership and business issues in international family firms? How can Canadian family firms best organize in order to compete internationally?

### **SMO 643 Strategic Management in the Public Sector**

★3 (fi 6) (either term, 3-0-0). Strategic management in the public sector comprises defining public value, building consensus and support, making decisions, deploying organizational capacity to implement, and managing performance to achieve the desired mission and goals. Addresses the unique complexities, ambiguities and messiness of strategic management in the public sector.

### **SMO 644 Public Sector Leadership**

★3 (fi 6) (either term, 3-0-0). Nearly all research on leadership has focused on the private sector. This course will concentrate on the unique features of leadership in the public and non-profit sectors. The course will examine the senior management structures in the different orders of government but the focus will be transformative leadership in areas of current policy interest including examples from environment, health, education, and social services. Prerequisite: SMO 652.

### **SMO 650 Internet Strategy for Small Business**

★3 (fi 6) (either term, 3-0-0). Focuses on how consultants prepare client organizations (especially small businesses and not-for-profit, volunteer organizations) for a decision as to how to include the internet as part of their business strategy. In the initial part of the course students will familiarize themselves with the internet as it pertains to e-business and not-for-profit uses. In the second part, students will prepare advisory reports for a real business or a not-for-profit organization. Basic internet skills (e-mail, browsers, using search engines, creating simple web pages) are important although tutorials will be offered for students lacking these skills.

### **SMO 652 Leadership Skills**

★3 (fi 6) (either term, 3-0-0). The purpose of this course is to increase the student's understanding of leadership roles and skill in exercising those roles. These include team building, mentoring, managing conflict, delegating, managing participative decision making, creative problem solving, and time and stress management.

### **SMO 657 Interpersonal Communication and Team Management**

★3 (fi 6) (either term, 3-0-0). This course provides the understanding of interpersonal (or face-to-face) communication process and presents opportunities for personal skill development. Students should expect to engage in role plays and to receive feedback on their personal style of communication. Topics include team communication supervisory-subordinate relationships, influence and persuasion, conflict management, and performance appraisal.

### **SMO 658 Technology Commercialization, Knowledge and Organizations**

★3 (fi 6) (either term, 3-0-0). This course will provide students with a broad overview of social scientific research on the organizational contexts, processes and outcomes of technology commercialization. By focusing on knowledge and organization, we will pay particular attention to how the commercialization of technology involves the transformation and transfer of more fundamental

knowledge into commercial application. This movement covers a wide array of actors, processes and circumstances development can occur through formal channels within an organization, between organizations, or across organizational fields such as through knowledge spillovers. The course is intended for students interested in gaining a deeper understanding of technology commercialization issues and processes. It will be organized as a seminar where students will be expected to play a key role in sharing the task of presenting and discussing the assigned readings with the professor.

#### **SMO 659 The Strategic Management of Technological Innovation and Commercialization**

★3 (fi 6) (either term, 3-0-0). This course addresses business principles at the interface of organization and technological change. It is intended for future managers and entrepreneurs, and provides the strategic frameworks needed to manage and profit from technological innovation. This course is designed in three parts, starting with an examination of innovation in the context of historical patterns of technological change. Second, it will address the organizational challenges in creating and managing innovation. To close, the course will integrate this knowledge and introduce strategies for commercialization and business development. Case studies and a final project will create opportunities to apply the frameworks.

#### **SMO 686 Selected Topics in Behavioral Sciences**

★3 (fi 6) (either term, 3-0-0). Students should check with the MBA Office for pre/corequisites of specific sections.

#### **SMO 810 The Manager as Strategist**

★1.5 (fi 16) (first term, 18 hours). A week-long intensive course. Identifying and developing the human resources, leadership, and strategy skills essential for today's successful executive. Restricted to Executive MBA students only.

#### **SMO 820 Managing Human Resources**

★3 (fi 32) (first term, 3-0-0). Understanding interpersonal behavior within organizations; assessing and developing interpersonal effectiveness both as a leader and a team member. Restricted to Executive MBA students only.

#### **SMO 860 Management of Technology/Innovation**

★3 (fi 32) (first term, 3-0-0). Understanding basic science and technology; integrating new technology into operations; managing research and development. Restricted to Executive MBA students only.

#### **SMO 870 Corporate Strategy**

★3 (fi 32) (second term, 3-0-0). Understanding corporate strategy and processes to mobilize resources to achieve corporate objectives; industry and competitive analysis. Restricted to Executive MBA students only.

#### **SMO 875 Leadership**

★3 (fi 32) (second term, 3-0-0). Understanding the unique perspectives, tasks, and responsibilities of the executive in providing leadership to the organization; dynamic processes of organizations; and developing leadership skills. Restricted to Executive MBA students only.

## 231.263 Surgery, SURG

Department of Surgery  
Faculty of Medicine and Dentistry

### Undergraduate Courses

#### **SURG 546 Surgery Student Internship**

★7 (fi 14) (either term, 7 weeks). Student internship for students registered in the MD program.

#### **SURG 556 Surgery Student Internship**

★6 (fi 12) (either term, 6 weeks). Student internship for students registered in the MD Program.

### Graduate Courses

#### **SURG 510 Gene Transfection and Expression**

★3 (fi 6) (first term, 1-0-3 in 4 weeks). This course will prepare graduate students for carrying out projects requiring molecular biology techniques. Topics to be covered include preparation of competent bacteria; bacterial transformation with gene of interest; growing transformed bacteria in a large scale; isolation of plasmid DNA containing gene of interest; isolation of DNA insert by electrocloture method to be used as a probe; gene transfection of human mammalian cells such as dermal fibroblasts; preparation of total RNA from transfected and untransfected cells; separation of RNA by gel electrophoresis; RNA blotting and hybridization with probe of interest; DNA labelling; analysis of corresponding protein as a gene product in transfected cells using a variety of techniques including ELISA, Western blot analysis, immunohistochemistry or receptor assay. It will provide students with an understanding of the basic science on which these techniques will be based. This course is intended for Surgical Residents and Fellows working in experimental surgery. Prerequisite: consent of Department.

#### **SURG 520 Directed Reading in Biomedical Research**

★3 (fi 6) (two term, 2-0-0). Lecture series on research techniques in the biomedical sciences intended for students with an advanced medical background. Prerequisite: consent of Department

#### **SURG 530 Directed Reading in Biology and Medicine**

★3 (fi 6) (either term, 3-0-0). Reading and study of topics in biomedical research of relevance to the student's interest under direction of one or more faculty members.

#### **SURG 555 Microvascular Surgery**

★3 (fi 6) (either term, 40 hours). The course reviews the fundamentals of microvascular surgery, and then allows supervised instruction in techniques including dissection, vascular anastomosis, mobilization of free flaps of vascularized tissue, transplantation and vein grafts. This course is intended for individuals with an extensive background in the theory and practice of surgery such as Surgery Residents and experienced researchers in the field. Prerequisite: consent of Department.

#### **SURG 570 From Basic to Clinical Immunology**

★3 (fi 6) (two term, 1-0-0). This course will begin with the fundamentals of basic immunology to provide the basis for understanding subsequent clinical immunology lectures. Invited basic science and clinical professionals will also give a lecture on the application of immunology in clinical fields such as transplantation, immunodeficiency, and cancer, followed by a full class discussion. Topics will include: innate and acquired immunity, autoimmunity, transplantation immunology, immunodeficiency, hypersensitivity, tumor immunology, immunochemistry and vaccines. Common and new techniques used in Basic and Clinical Immunology research will also be covered. Intended for students with an advanced medical background. Prerequisite: consent of the Department.

#### **SURG 600 Research Seminar**

★2 (fi 4) (two term, 0-1s-0). A weekly series of seminars on current research is held during Fall and Winter Terms. Graduate students must attend and make two presentations in this series.

## 231.264 Swahili, SWAH

Department of Modern Languages and Cultural Studies  
Faculty of Arts

### Notes

- (1) The Department reserves the right to place students in the language course appropriate to their level of language skill.
- (2) Placement tests may be administered in order to assess background. Students with a Swahili language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in a more advanced course suitable to their level of ability. Students seeking to fulfill their Language Other than English requirement may begin at any one appropriate level, but must take the full ★6 in one language.
- (3) The Department will withhold credit from students completing courses for which prior background is deemed to make them ineligible. For example, 100-level courses are normally restricted to students with little or no prior knowledge in that language. Should students with matriculation standing or those possessing background (such as native speakers or those for whom it is their first language) register in the 100-level course, credit may be withheld.

### Undergraduate Courses

#### **0 SWAH 111 Beginners' Swahili I**

★3 (fi 6) (either term, 5-0-0). Introduction to Swahili language and culture. Not to be taken by students with native or near native proficiency, or SWAH 35 or its equivalents in Canada and other countries.

#### **0 SWAH 112 Beginners' Swahili II**

★3 (fi 6) (either term, 5-0-0). Continuation of SWAH 111. Prerequisite: SWAH 111 or consent of Department. Not to be taken by students with native or near native proficiency, or SWAH 35 or its equivalents in Canada and other countries.

#### **0 SWAH 211 Intermediate Swahili I**

★3 (fi 6) (either term, 4-0-0). Intended to consolidate a basic understanding of Swahili language and culture through building upon basic language skills acquired in SWAH 111/112; emphasizing oral proficiency and aural comprehension; writing skills beyond the basic level; introduction to Swahili texts and systematic review of grammar. Prerequisite: SWAH 112 or consent of Department.

#### **0 SWAH 212 Intermediate Swahili II**

★3 (fi 6) (either term, 4-0-0). Continuation of SWAH 211 and cultural interactive activities with native Swahili speakers through integrating Community Service Learning component. Prerequisite: SWAH 211 or consent of Department.



## 231.265 Swedish, SWED

Department of Modern Languages and Cultural Studies  
Faculty of Arts

### Notes

- (1) The Department reserves the right to place students in the language course appropriate to their level of language skill.
- (2) Placement tests may be administered in order to assess prior background. Students with a Swedish language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in a more advanced course more suitable to their level of ability. Students seeking to fulfill their Language Other than English requirement may begin at any one appropriate level, but must take the full ★6 in one language.
- (3) The Department will withhold credit from students completing courses for which prior background is deemed to make them ineligible. For example, 100-level courses are normally restricted to students with little or no prior knowledge in that language. Should a student with matriculation standing, or those possessing prior background (such as native speakers or those for whom it is their first language) register in the 100-level course, credit may be withheld.
- (4) See also listings under Modern Languages and Cultural Studies (MLCS) and Scandinavian (SCAND).

### Undergraduate Courses

#### 0 SWED 111 Beginners' Swedish I

★3 (fi 6) (either term, 5-0-0). Designed to give basic practical skill in everyday spoken and written Swedish. The oral approach, using the laboratory, is followed. Note: not to be taken by students with credit in SWED 100, or with native or near native proficiency, or with Swedish 30 or its equivalents in Canada and other countries.

#### 0 SWED 112 Beginners' Swedish II

★3 (fi 6) (either term, 5-0-0). Prerequisite: SWED 111 or consent of Department. Note: not to be taken by students with credit in SWED 100, or with native or near native proficiency, or with Swedish 30 or its equivalents in Canada and other countries.

#### 0 SWED 211 Second-Year Swedish I

★3 (fi 6) (either term, 4-0-0). Reading and study of selected texts in Swedish literature and culture. Conversation and composition. Prerequisite: Swedish 30 (or equivalent) or SWED 112 or consent of Department. Note: not to be taken by students with credit in SWED 200.

#### 0 SWED 212 Second-Year Swedish II

★3 (fi 6) (either term, 4-0-0). Prerequisite: SWED 211 or consent of Department. Note: not to be taken by students with credit in SWED 200.

## 231.266 Theatre Design, T DES

Department of Drama  
Faculty of Arts

For other courses in the Department of Drama see Drama Course listings.

### Undergraduate Courses

#### T DES 170 Fundamentals of Stagecraft and Design

★3 (fi 6) (either term, 3-0-0). Production techniques, construction, mechanics, lighting and design. Note: Restricted to BFA Drama (Design) and (Technical Theatre) students. Not to be taken by students with credit in Drama 279, 379 or 479.

#### T DES 171 Studio Techniques for Theatre Design

★6 (fi 12) (two term, 0-4L-0). Study and practice of the studio techniques employed in theatre design. Note: Not to be taken by students with credit in DRAMA 371. Prerequisite: consent of department.

#### T DES 172 Technical Drawing for Theatre Design

★3 (fi 6) (either term, 2-0-1). Studies in drafting and perspective drawing for the stage. Note: Restricted to BFA Drama (Design) and (Technical Theatre) students. Note: Not to be taken by students with credit in DRAMA 270 or 471.

#### T DES 270 Theatre Design I

★6 (fi 12) (two term, 0-6L-0). Study and practice of design for the theatre. Restricted to BFA Drama (Design) and (Technical Theatre) students or consent of department.

#### T DES 271 Computer Graphics for Theatre Design

★3 (fi 6) (either term, 2-0-2). Study in practice of computer graphic techniques employed in theatre design. Note: Restricted to BFA Drama (Design) and (Technical Theatre) students or consent of Department.

#### T DES 272 CAD for the Theatre

★3 (fi 6) (either term, 2-0-2). Computer aided design for the theatre designer and technician. Note: Restricted to BFA Drama (Design) and (Technical Theatre) students. Note: Not to be taken by students with credit in DRAMA 491

#### T DES 273 Production Techniques: Scene Painting

★3 (fi 6) (first term, 0-6L-0). Theory and techniques of the texturing and painting of scenery. Note: Restricted to BFA Drama (Design) and (Technical Theatre) students, or consent of department. Not to be taken by students with credit in DRAMA 572 or 584.

#### T DES 274 Production Techniques: Advanced Scene Painting

★3 (fi 6) (second term, 0-6L-0). Prerequisite DRAMA 273. Note: Restricted to BFA Drama (Design) and (Technical Theatre) students, or consent of department. Not to be taken by students with credit in DRAMA 572 or 585

#### T DES 275 History of Dress and Decor I

★3 (fi 6) (either term, 3-0-0). A survey of style in western civilization from the ancients to the Renaissance. Prerequisite: consent of department. Note: Not to be taken by students with credit in DRAMA 375 or HECOL 150, 268 or 360.

#### T DES 278 Drawing

★3 (fi 6) (two term, 0-3L-0). Development and application of drawing techniques with emphasis on drawing for the theatre. Note: A single-term course offered over two terms. Restricted to BFA Drama (Design) students.

#### T DES 370 Theatre Design II

★6 (fi 12) (two term, 0-6L-0). Further study and practice of design for the theatre. Prerequisite: DRAMA 270. Note: Restricted to BFA Drama (Design) students.

#### T DES 372 3D CAD for the Theatre

★3 (fi 6) (either term, 2-0-2). Exploration, practice and experimentation with 3D CAD for theatrical application. Note: Restricted to BFA Drama (Design) and (Technical Theatre) students. Offered in alternate years.

#### T DES 373 Production Techniques: Lighting Design

★3 (fi 6) (first term, 4-2L-0). Theory and techniques of lighting design. Note: Restricted to BFA Drama (Design) and (Technical Theatre) students, or consent of department. Note: Not to be taken by students with credit in DRAMA 372 or 384.

#### T DES 374 Production Techniques Advanced: Lighting Design

★3 (fi 6) (second term, 0-6L-0). Prerequisite: T DES 373. Note: Restricted to BFA Drama (Design) and (Technical Theatre) students, or consent of department. Note: Not to be taken by students with credit in DRAMA 372 or 385.

#### T DES 375 History of Dress and Decor II

★3 (fi 6) (either term, 3-0-0). A survey of style in western civilization from the Renaissance to the present. Prerequisite: consent of department. Note: Not to be taken by students with credit in DRAMA 375 HECOL 150, 268 or 360.

#### T DES 376 Design Assistantship I

★3 (fi 6) (two term, 0-0-6). Practical experience in assisting the designer. Corequisite: T DES 370. Note: A single-term course offered over two terms. Restricted to BFA Drama (Design) students. Not to be taken by students with credit in DRAMA 473 or 493.

#### T DES 377 Production Design I

★3 (fi 6) (two term, 0-0-6). Practical experience in designing an element or elements of a production. Note: A single-term course offered over two terms. Restricted to BFA Drama (Design) students. Not to be taken by students with credit in DRAMA 476.

#### T DES 378 Drawing II

★3 (fi 6) (two term, 0-3L-0). Further development and application of drawing techniques with emphasis on drawing for the theatre. Note: A single-term course offered over two terms. Restricted to BFA Drama (Design) students.

#### T DES 470 Theatre Design III

★6 (fi 12) (two term, 0-6L-0). A specialized course for advanced students, designed to meet the needs of the individual. Prerequisite: T DES 370. Note: Restricted to BFA Drama (Design) students. Not to be taken by students with credit in DRAMA 570.

#### T DES 471 Portfolio

★0 (fi 2) (two term, 0-1s-0). Portfolio assessment. Note: Not to be taken by students with credit in DRAMA 571.

#### T DES 473 Production Techniques: Costume

★3 (fi 6) (first term, 0-6L-0). Theory and techniques of stage costuming. Note: Restricted to BFA Drama (Design) and (Technical Theatre) students, or consent of department. Not to be taken by students with credit in DRAMA 472 or 484.

#### T DES 474 Production Techniques: Advanced Costume

★3 (fi 6) (second term, 0-6L-0). Prerequisite: T DES 473. Note: Restricted to BFA Drama (Design) and (Technical Theatre) students or consent of department. Not to be taken by students with credit in DRAMA 472 or 485.

**T DES 475 Topics in the History of Theatre Design**

★3 (*fi 6*) (either term, 3-0-0). History of design and scenography for the theatre.

**T DES 476 Design Assistantship II**

★6 (*fi 12*) (two term, 0-0-6). Practical experience in assistant designing. Corequisite T DES 470. Note: Restricted to BFA Drama (Design) students.

**T DES 477 Production Design II**

★3 (*fi 6*) (two term, 0-0-6). Practical experience in designing an element or elements of a production. Restricted to BFA Drama (Design) students. A single-term course offered over two terms. Not to be taken by students with credit in DRAMA 576.

**T DES 479 Practicum**

★6 (*fi 12*) (two term, 0-9L-0). A practical extension of the production techniques courses, involving the student in the production process of main stage shows. Pre or corequisite: T DES 273, 373, or 473. Note: Not to be taken by students with credit in DRAMA 579.

**Graduate Courses****T DES 570 Advanced Theatre Design I**

★6 (*fi 12*) (two term, 0-6L-0). Note: Restricted to MFA Drama (Design) students.

**T DES 571 Advanced Studio Techniques for Theatre Design**

★3 (*fi 6*) (either term, 0-4L-0). Study and practice of the studio techniques employed in theatre design. Note: Restricted to MFA Drama (Design) students.

**T DES 572 Advanced Technical Drawing for Theatre Design**

★3 (*fi 6*) (either term, 2-0-1). Studies in drafting and perspective drawing for the stage. Note: Restricted to MFA Drama (Design) students.

**T DES 573 Advanced Scene Painting**

★3 (*fi 6*) (either term, 0-6L-0). Note: Restricted to MFA Drama (Design) students.

**T DES 575 History of Dress and Decor I**

★3 (*fi 6*) (either term, 3-0-0). A survey of style in western civilization from the ancients to the Renaissance. Offered in alternate years.

**T DES 576 Design Assistantship III**

★3 (*fi 6*) (either term, 0-0-6). Practical experience in assistant designing. Note: Restricted to MFA Drama (Design) students.

**T DES 577 Production Design III**

★3 (*fi 6*) (either term, 0-0-6). Practical experience in designing an element or elements of a production. Note: Restricted to MFA Drama (Design) students.

**T DES 578 Advanced Drawing**

★3 (*fi 6*) (either term, 0-3L-0). Development and application of drawing techniques with emphasis on drawing for the theatre. Note: Restricted to MFA Drama (Design) students.

**T DES 579 Practicum**

★3 (*fi 6*) (either term, 0-9L-0). A practical extension of the production techniques courses, involving the student in the production process of main stage shows. Pre- or corequisite: T DES 573, 673, or 773. Note: Restricted to MFA Drama (Design) students.

**T DES 580 Design for Directors**

★3 (*fi 6*) (either term, 0-3L-0). Corequisites: DRAMA 660, 661, 680 or 681. Note: Restricted to MFA Drama (Directing) students and MA Drama students (with consent of department). Not to be taken by students with credit in DRAMA 672.

**T DES 670 Advanced Theatre Design II**

★6 (*fi 12*) (two term, 0-6L-0). Note: Restricted to MFA Drama (Design) students.

**T DES 671 Advanced Computer Graphics for Theatre Design**

★3 (*fi 6*) (either term, 2-0-2). Study in practice of computer graphic techniques employed in theatre design. Note: Restricted to MFA Drama (Design) students.

**T DES 672 Advanced CAD for the Theatre**

★3 (*fi 6*) (either term, 2-0-2). Computer aided design for the theatre designer and technician. Note: Restricted to MFA Drama (Design) students.

**T DES 673 Advanced Lighting Design**

★3 (*fi 6*) (either term, 0-6L-0). Note: Restricted to MFA Drama (Design) students.

**T DES 675 History of Dress and Decor II**

★3 (*fi 6*) (either term, 3-0-0). A survey of style in western civilization from the Renaissance to the present. Offered in alternate years.

**T DES 676 Design Assistantship IV**

★3 (*fi 6*) (either term, 0-0-6). Practical experience in assistant designing. Note: Restricted to MFA Drama (Design) students.

**T DES 677 Production Design IV**

★3 (*fi 6*) (either term, 0-0-6). Practical experience in designing an element or elements of a production. Note: Restricted to MFA Drama (Design) students.

**T DES 770 Advanced Theatre Design III**

★6 (*fi 12*) (two term, 0-6L-0). Note: Restricted to MFA Drama (Design) students.

**T DES 772 Advanced 3D CAD for the Theatre**

★3 (*fi 6*) (either term, 2-0-2). Exploration, practice and experimentation with 3D CAD for theatrical application. Note: Restricted to MFA Drama (Design) students. Offered in alternate years.

**T DES 773 Advanced Costume Techniques**

★3 (*fi 6*) (either term, 0-6L-0). Note: Restricted to MFA Drama (Design) students.

**T DES 775 Advanced Topics in the History of Theatre Design**

★3 (*fi 6*) (either term, 3-0-0). History of design and scenography for the theatre.

**231.267 Thesis, THES**

Faculty of Graduate Studies and Research

**Graduate Courses****THES 901 Thesis Research**

★0 (*fi 2*) (either term, unassigned). Represents research activity equivalent to ★1 for registration status and fee assessment purposes. Approval of the Faculty of Graduate Studies and Research required.

**THES 902 Thesis Research**

★0 (*fi 4*) (either term, unassigned). Represents research activity equivalent to ★2 for registration status and fee assessment purposes. Approval of Faculty of Graduate Studies and Research required.

**THES 903 Thesis Research**

★0 (*fi 6*) (either term, unassigned). Represents research activity equivalent to ★3 for registration status and fee assessment purposes.

**THES 904 Thesis Research**

★0 (*fi 8*) (either term, unassigned). Represents research activity equivalent to ★4 for registration status and fee assessment purposes.

**THES 905 Thesis Research**

★0 (*fi 10*) (either term, unassigned). Represents research activity equivalent to ★5 for registration status and fee assessment purposes.

**THES 906 Thesis Research**

★0 (*fi 12*) (either term, unassigned). Represents research activity equivalent to ★6 for registration status and fee assessment purposes.

**THES 907 Thesis Research**

★0 (*fi 14*) (either term, unassigned). Represents research activity equivalent to ★7 for registration status and fee assessment purposes.

**THES 908 Thesis Research**

★0 (*fi 16*) (either term, unassigned). Represents research activity equivalent to ★8 for registration status and fee assessment purposes.

**THES 909 Thesis Research**

★0 (*fi 18*) (either term, unassigned). Represents research activity equivalent to ★9 for registration status and fee assessment purposes.

**THES 910 Thesis Research**

★0 (*fi 0*) (either term, unassigned). For special purposes. Approval of Faculty of Graduate Studies and Research required.

**THES 919 Thesis Research**

★0 (*fi 0*) (either term, unassigned). Represents research activity equivalent to ★9 for registration status purposes. Requires payment of a set fee. See §22.2.

**THES 953 Thesis Research**

★0 (*fi 0*) (either term, unassigned). Represents thesis research activity equivalent to ★3 for registration status purposes. No instruction fees are assessed. Restricted to doctoral students registered in ★3 in the preceding Spring or Summer term. Department and Faculty of Graduate Studies and Research consent required.

**THES 956 Thesis Research**

★0 (*fi 0*) (either term, unassigned). Represents research activity equivalent to ★6 for registration status purposes. No instruction fees are assessed. Restricted to doctoral students registered in ★6 in the preceding Spring or Summer term. Department and Faculty of Graduate Studies and Research consent required.

**THES 959 Thesis Research**

★0 (*fi 0*) (either term, unassigned). Represents research activity equivalent to ★9 for registration status purposes. No instruction fees are assessed. Restricted to doctoral students registered in ★9 in the preceding Spring or Summer term. Department and Faculty of Graduate Studies and Research consent required.

**THES 988 Thesis Research**

★9 (*fi 18*) (either term, unassigned). Represents research activity equivalent to ★9 for registration status purposes. Restricted to graduate degree students

who are conducting thesis research at another institution under a formal Institutional Agreement. Approval of the Faculty of Graduate Studies and Research required.

## 231.268 Ukrainian, UKR

Department of Modern Languages and Cultural Studies  
Faculty of Arts

### Notes

- (1) The Department reserves the right to place students in the language course appropriate to their level of language skill.
- (2) Placement tests may be administered in order to assess prior background. Students with a Ukrainian language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in an advanced course more suitable to their level of ability. Students seeking to fulfill their Language Other than English requirement may begin at any one appropriate level, but must take the full ★6 in one language.
- (3) The Department will withhold credit from students completing courses for which prior background is deemed to make them ineligible. For example, 100-level courses are normally restricted to students with little or no prior knowledge in that language. Should a student with matriculation standing, or those possessing prior background (such as native speakers or those for whom it is their first language) register in the 100-level course, credit may be withheld.
- (4) See also Modern Languages and Cultural Studies (MLCS) and Slavic and East European Studies (SLAV) listings, and INT D courses offered by the Faculty of Arts.

### Undergraduate Courses

#### 0 UKR 111 Beginners' Ukrainian I

★3 (fi 6) (either term, 5-0-0). For students with little or no background in Ukrainian, the course emphasizes oral communication while developing basic listening, reading and writing skills. Cultural practices are taught as an integral part of the language. Note: not to be taken by students with credit in UKR 100, or with native or near native proficiency, or with Ukrainian 30 or its equivalents in Canada and other countries.

#### 0 UKR 112 Beginners' Ukrainian II

★3 (fi 6) (either term, 5-0-0). Prerequisite: UKR 111 or consent of Department. Note: not to be taken by students with credit in UKR 100, or with native or near native proficiency, or with Ukrainian 30 or its equivalents in Canada and other countries.

#### 0 UKR 211 The Ukrainian-speaking World I

★3 (fi 6) (either term, 4-0-0). Contemporary language and culture through newspapers, magazines, TV and the Internet. Prerequisite: Ukrainian 30 (or equivalent matriculation standing), or UKR 112, or consent of Department. Note: not to be taken by students with credit in UKR 150, 201, 202, 203, 204.

#### 0 UKR 212 The Ukrainian-speaking World II

★3 (fi 6) (either term, 4-0-0). Focus on elementary conversation and composition. Prerequisite: UKR 211 or consent of Department. Note: not to be taken by students with credit in UKR 150, 202, 204.

#### 0 UKR 300 Ukrainian through its Living Culture I

★6 (fi 12) (either term, 3-0-0). Practical language skills with a direct experience of Ukrainian life and culture in the Lviv environment. The language of instruction is Ukrainian. Prerequisite: UKR 212 or consent of Department.

#### 0 UKR 303 Ukrainian in Context I

★3 (fi 6) (either term, 3-0-0). Conversation and writing through films, news items, short stories and plays. Prerequisite: UKR 212 (formerly 150, 202), or consent of Department. Note: not to be taken by students with credit in UKR 401 or 402.

#### 0 UKR 304 Ukrainian in Context II

★3 (fi 6) (either term, 3-0-0). Prerequisite: UKR 303 (formerly 401) or consent of Department. Note: not to be taken by students with credit in UKR 402.

#### 0 UKR 324 Ukrainian Culture I

★3 (fi 6) (either term, 3-0-0). Comparison among contemporary life in Ukraine today, Ukrainian Canadian culture, and traditional village life in the past. Focus is on everyday life and spiritual culture. Language of instruction is English. This course does not fulfil the language other than English requirement of the BA.

#### 0 UKR 325 Ukrainian Culture II

★3 (fi 6) (either term, 3-0-0). Comparison among contemporary life in Ukraine today, Ukrainian Canadian culture, and traditional village life in the past. Focus is on community relationships, arts, recreation, cultural representation and change. This course does not fulfil the language other than English requirement of the BA.

#### 0 UKR 327 Early Ukrainian-Canadian Culture

★3 (fi 6) (either term, 3-0-0). Immigration, settlement, traditions and material culture of Ukrainians in Alberta to 1930, with special reference to activities at the

Ukrainian Cultural Heritage Village. Note: This course is given in Spring/Summer only. Language of instruction is English. This course will not fulfil the Language other than English requirement of the BA degree.

#### UKR 333 Introduction to Ukrainian Fiction

★3 (fi 6) (either term, 3-0-0). A beginner's-friendly course that uses annotated and parallel Ukrainian-English texts to guide students through the basics of reading and analyzing Ukrainian prose in the original. A variety of authors and themes are explored from the 19th to the 21st centuries, providing a perspective on the development of modern Ukrainian identity and culture, while building the student's Ukrainian reading vocabulary. Prerequisite: UKR 212 or consent of Department.

#### UKR 400 Ukrainian through its Living Culture II

★6 (fi 12) (either term, 3-0-0). Improves students' language and cultural proficiency through direct experience of contemporary Ukrainian life in Lviv. Prerequisite: UKR 300 or 304 or consent of Department.

#### 0 UKR 403 Ukrainian in the Media and Internet

★3 (fi 6) (either term, 3-0-0). Practical language skills in the context of life in Ukraine through traditional and contemporary media. Debates, interviews and opinion polls. Basic discourse analysis. Prerequisite: UKR 300 or 304 (formerly 402), or consent of Department.

#### 0 UKR 404 Ukrainian on TV and in Film

★3 (fi 6) (either term, 3-0-0). Advanced language course with creative writing, critiques and discussions. Prerequisite: UKR 300 or 304 (formerly 402), or consent of Department.

#### 0 UKR 405 Children's Literature in Ukrainian

★3 (fi 6) (either term, 3-0-0). Advanced language skills for the future teacher through a survey of poetry, tales, legends and riddles adapted for the young reader. Prerequisite: UKR 300 or 304 (formerly 402), or consent of Department.

#### 0 UKR 406 Business Ukrainian

★3 (fi 6) (either term, 3-0-0). Advanced modern Ukrainian with emphasis on the vocabulary and communication style of the Ukrainian business world. Prerequisite: UKR 300 or 304 (formerly 402), or consent of Department.

#### 0 UKR 407 Translating Literature: Ukrainian to English

★3 (fi 6) (either term, 3-0-0). Evaluation and comparison of existing translations, and extensive practical exercises. Prerequisite: UKR 300 or 304 (formerly 402), or consent of Department.

#### 0 UKR 411 The Style and Structure of Contemporary Ukrainian

★3 (fi 6) (either term, 3-0-0). Ukrainian and its various styles including dialects, jargon and slang. Prerequisite or corequisite: UKR 300 or 304 (formerly 402), or consent of Department.

#### UKR 413 Translation in the Global Economy: Ukrainian-English-Ukrainian

★3 (fi 6) (either term, 3-0-0). Ukrainian-English and English-Ukrainian translation with focus on non-literary texts, e.g. journalistic, business, legal, and scientific prose. Prerequisite or corequisite: UKR 300 or 304 (formerly 402), or consent of Department.

#### 0 UKR 415 Women in Culture: Fictional Characters/Feminist Writers

★3 (fi 6) (either term, 3-0-0). The course delves into the role and representation of women in 19th- and 20th-century Ukraine. It traces the evolution of female characters from Romanticism to Postmodernism and explores contributions by women to the Ukrainian literary and cultural canon. Social issues and sexual politics are examined in the light of women's biographies as well as their fictional worlds. Note: Readings are available in English for students not taking Ukrainian as a major or minor.

#### 0 UKR 422 Ukrainian Folk Songs

★3 (fi 6) (either term, 3-0-0). A survey of the folk song genres, with analysis of texts in the original. Some field work. Pre- or corequisite: UKR 303 or consent of Instructor.

#### 0 UKR 423 Ukrainian Folk Prose

★3 (fi 6) (either term, 3-0-0). A survey of the prose and minor verbal genres, with analysis of texts in the original. Some field work. Prerequisite: UKR 303 or consent of Instructor.

#### UKR 424 Ukrainian Folk Belief

★3 (fi 6) (either term, 3-0-0). Examination of traditional attitudes toward the supernatural. Focus on folk medicine, the causes of illness, and traditional cures. Prerequisite: UKR 303 or consent of Instructor.

#### 0 UKR 425 Ukrainian Rites of Passage

★3 (fi 6) (either term, 3-0-0). Examines rites of passage for birth, marriage and death. Some field work. Pre- or corequisite UKR 303 or consent of Instructor.

#### 0 UKR 426 Ukrainian Calendar Customs

★3 (fi 6) (either term, 3-0-0). Examines seasonal folk customs, including winter, spring, summer and autumn rites. Some field work. Prerequisite: UKR 303 or consent of Instructor.



**UKR 427 Ukrainian Material Culture and Folk Art**

★3 (fi 6) (either term, 3-0-0). The form, meaning and context of folk art and craft.

**UKR 469 Civilization and Culture in Ukraine: 988-1794**

★3 (fi 6) (either term, 3-0-0). Major trends in thought of pre-secular Ukraine. The literary, iconographic and musical legacy of Kyivan and Galician-Volhynian Rus' and its transformation during the Ruthenian renaissance. Lectures in English. Readings available in English for students not taking Ukrainian as a major or minor. Otherwise modern Ukrainian translations will be assigned.

**UKR 471 Ukrainian Romanticism**

★3 (fi 6) (either term, 3-0-0). Introduces the major themes and genres of Ukrainian Romanticism against the background of early 19th century interest in folklore and history. Readings range from I Kotliarevsky, L Borovykovsky, A Metlynsky, and M Kostomarov to P Kulish, with special emphasis on T Shevchenko. Prerequisite: UKR 300 or 303; or co-requisite 304 or consent of Department.

**UKR 472 Ukrainian Realism**

★3 (fi 6) (either term, 3-0-0). Realist trends in the short story, novel, and drama from the second-half of the 19th-century to the 1920s. Populism, psychologism, and class conflict are some of the issues addressed. Prerequisite : UKR 300 or UKR 303; or co-requisite 304 or consent of Department.

**UKR 473 Ukrainian Modernism and Avant-Garde**

★3 (fi 6) (either term, 3-0-0). The dramatic revolt against 19th-century aesthetics from the 1890s to 1930. Selected poetry, short prose, drama, and manifestoes highlight the philosophical and formal innovations introduced by such movements as symbolism, futurism, and constructivism. Analogies are drawn to the visual arts. Prerequisite: UKR 300 or UKR 303; or co-requisite 304 or consent of Department.

**UKR 475 Ukrainian Literature Today**

★3 (fi 6) (either term, 3-0-0). The course begins with developments on the eve of Ukrainian independence (1991). The dramatic transformation of literature is surveyed against the background of the collapse of communism and socialist realism. Emphasis is on the youngest and most radical generation of writers and critics, their styles, themes, and ideologies. Prerequisite: consent of Department. Note: Readings are available in English for students not taking Ukrainian as a major or minor.

**UKR 495 Honors Thesis**

★3 (fi 6) (either term, 0-3s-0).

**UKR 499 Special Topics**

★3 (fi 6) (either term, 3-0-0).

**Graduate Courses****UKR 503 Ukrainian in the Media and Internet**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**UKR 504 Ukrainian on TV and in Film**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**UKR 505 Children's Literature in Ukrainian**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**UKR 515 Early-Modern Ukrainian Poetry and Drama (1550s-1780s)**

★3 (fi 6) (either term, 3-0-0). The impact of humanistic theory on the linguistic and formal features of occasional verse, religious lyric, school drama, and political dialogue. Course also considers the alternative poetics of the love lyric, the puppet theatre, and the oral epic. Authors include H Smotrytsky, K Sakovych, L Baranovych, I Velychkovsky, S Iavorsky, T Prokopovych, M Dovhalevsky, and H Skovoroda. Reading knowledge of Middle Ukrainian (i.e., Ruthenian) or Polish or Latin desirable. Prerequisite: consent of Department.

**UKR 516 Early-Modern Ukrainian Prose (1550s-1780s)**

★3 (fi 6) (either term, 3-0-0). A study of the impact of humanistic rhetoric on polemical prose, religious oratory, diaries, philosophical tracts, and colloquies. The radical transformation of discourse is illustrated by selections drawn from the Cossack Chronicles. Authors include Z Kopystensky, I Vyshensky, and H Skovoroda; I Galiatovsky, D Tuptalo and A Radyvylovsky; P Orlyk, H Hrabianka, and S Velychko. Reading knowledge of Middle Ukrainian (i.e., Ruthenian) or Polish or Latin desirable. Prerequisite: consent of Department.

**UKR 522 Ukrainian Folk Songs**

★3 (fi 6) (either term, 3-0-0). A survey of the folk song genres, with analysis of texts in the original. Some field work. Prerequisite: consent of Department.

**UKR 523 Ukrainian Folk Prose**

★3 (fi 6) (either term, 3-0-0). A survey of the prose and minor verbal genres, with analysis of texts in the original. Some field work. Prerequisite: consent of Department.

**UKR 524 Ukrainian Folk Belief**

★3 (fi 6) (either term, 3-0-0). Examination of the traditional attitudes towards the supernatural. Focus on folk medicine, the causes of illness, and traditional cures. Prerequisite: consent of Department.

**UKR 525 Ukrainian Rites of Passage**

★3 (fi 6) (either term, 3-0-0). Examines rites of passage for birth, marriage and death. Some field work. Prerequisite: consent of Department.

**UKR 526 Ukrainian Calendar Customs**

★3 (fi 6) (either term, 3-0-0). Examines seasonal folk customs, including winter, spring, summer and autumn rites. Some field work. Prerequisite: consent of Department.

**UKR 527 Ukrainian Material Culture and Folk Art**

★3 (fi 6) (either term, 3-0-0). The form, meaning and context of folk art and craft. Prerequisite: consent of Department.

**UKR 531 History of Ukrainian Folklore Studies**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**UKR 532 Ukrainian Folklore in Canada**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**UKR 565 Women in Culture: Fictional Characters/Feminist Writers**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**UKR 571 Ukrainian Romanticism**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**UKR 572 Ukrainian Realism**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**UKR 573 Ukrainian Modernism and Avant-Garde**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department.

**UKR 575 Ukrainian Literature Today**

★3 (fi 6) (either term, 3-0-0). Focus on post-colonial theories of art. Prerequisite: consent of Department.

**UKR 599 Directed Reading**

★3 (fi 6) (either term, 3-0-0).

**UKR 645 Studies in Ukrainian Literary Criticism**

★3 (fi 6) (either term, 3-0-0). Detailed study of major critical texts from the 19th and 20th centuries.

**UKR 697 Topics in Ukrainian Folklore**

★3 (fi 6) (either term, 3-0-0).

**UKR 698 Topics in Ukrainian Linguistics**

★3 (fi 6) (either term, 3-0-0).

**UKR 699 Topics in Ukrainian Literature and Culture**

★3 (fi 6) (either term, 3-0-0).

**231.269 University, UNIV**

Faculty of Agricultural, Life and Environmental Sciences

**Undergraduate Courses****UNIV 101 First-Year Experience I**

★2 (fi 0) (either term, 0-3s-0). Topics relevant to successful academic performance including study skills, use of campus resources, stress management, and career planning.

**UNIV 102 First-Year Experience II**

★2 (fi 0) (second term, 0-3s-0). Exploration and application of university regulations, faculty expectations, pathways to academic excellence, and practical methods for surviving the challenges of first year on campus.

**231.270 Women's Studies, W ST**

Women's Studies Program  
Faculty of Arts

**Undergraduate Courses****W ST 101 Representations of Girls and Women**

★3 (fi 6) (either term, 3-0-0). An exploration of the impact that cultural representations of femininity have on the political, economic, and social lives of girls and women throughout the world.

**W ST 201 Introduction to Women's Studies**

★3 (fi 6) (either term, 3-0-0). Introduces students to the field of Women's Studies, with emphasis on the theoretical foundations of feminist analysis and the diversity of debates within feminism.

**W ST 202 Current Issues in Women's Studies**

★3 (fi 6) (either term, 3-0-0). Examines current and emerging topics and analytic perspectives in Women's Studies. Topics include women as individuals; women's families and communities; women's involvement in health, science, work, popular

culture, religion, politics and social change. Prerequisite: W ST 201 or consent of the Program.

### W ST 301 History of Feminist Thought

★3 (fi 6) (either term, 3-0-0). The development of feminist thought and theories from the 18th to the 20th century, including the contributions of, and tensions among various feminisms. Prerequisite: W ST 201 or consent of the Program.

### W ST 302 Feminist Research and Methodologies

★3 (fi 6) (either term, 3-0-0). Whether there can be and is a distinctive feminist perspective on research in various disciplines; the ways in which taking a feminist perspective or taking account of women in research, affects the research process. Prerequisite: W ST 201 or consent of the Program.

### W ST 310 Gender, Development, and Beyond

★3 (fi 6) (either term, 3-0-0). Study of the lives of men and women in the developing world, focusing on their experiences in the family, school, paid work, and the market, and on such development issues as health, environment, and human rights. Prerequisite: W ST 201 or consent of the Program. Not available to students with credit in R SOC 310.

### W ST 320 Popular Culture/Feminist Culture

★3 (fi 6) (either term, 3-0-0). This course examines selected cultural forms in Canadian and American society from feminist perspectives. The focus is both on developing a feminist critique of cultural representations of women, and on considering the possibilities of feminist intervention in and production of popular culture. Prerequisite: W ST 201 or consent of the Program.

### W ST 325 Gender and Visual Culture

★3 (fi 6) (either term, 3-0-0). An introduction to the field of visual culture studies with an emphasis on the ways that gender, sexuality, and power are involved in visual experiences. Prerequisite: W ST 201 or consent of the Program.

### W ST 332 Contemporary Feminist Theory

★3 (fi 6) (either term, 3-0-0). The origins and evolution of various schools of contemporary western feminist thought. Prerequisite: W ST 201 or consent of Program. Not available to students with credit in PHIL 332.

### W ST 350 Women and Science

★3 (fi 6) (either term, 3-0-0). This course will explore the roles of women in science, and the ways in which scientific theory and practice might better accommodate women's ideas, lives, and ways of knowing. Prerequisite: W ST 201 or consent of the Program.

### W ST 360 Race, Class and Gender in Canada

★3 (fi 6) (either term, 0-3s-0). Historical, contemporary and comparative perspectives on the interaction of race, class, and gender experiences in multicultural Canada. Prerequisite: W ST 201 or consent of Program.

### W ST 370 Feminism and Sexuality

★3 (fi 6) (either term, 3-0-0). Examination of contemporary feminist approaches to, and key debates about, sexuality. Topics may include: sexuality; critiques of heterosexuality; political lesbianism; queer theory; transgender and intersexuality; prostitution and sex work. Prerequisite: W ST 201 or consent of the Program.

### W ST 380 Canadian Feminist Activisms

★3 (fi 6) (either term, 3-0-0). An examination of contemporary feminist activism with an emphasis on second- and third-wave feminisms. Topics may include: distinctions between state and grassroots feminist activism; neoliberalism and governmentality; race and sexuality struggles within feminism; the rise and decline of national feminist organizing; cyberfeminism. This course may be offered as a Community Service Learning course. Prerequisite: W ST 201 or consent of the Program.

### W ST 401 Directed Readings in Women's Studies

★3 (fi 6) (either term, 0-3s-0). Open only to Women's Studies honors, majors and minors. Normally may be taken only once. Prerequisite: W ST 201, or consent of the Program.

### W ST 402 Honors Seminar and Project

★6 (fi 12) (two term, 0-3s-0). Prerequisite: W ST 201 and 302.

### W ST 410 Feminism/Postmodernism

★3 (fi 6) (either term, 0-3s-0). An introductory exploration of tensions, disadvantages, and advantages of postmodernism for feminist theory and practice in relation to cultural and political issues such as representation, agency, identity/difference/ambiguity, nature, bodies, sexualities, and community. Prerequisite: W ST 201 or consent of the Program. Not open to students with credit in W ST 300.

### W ST 420 Law and Feminism in Canada

★3 (fi 6) (either term, 0-3s-0). A focus on the fundamentally contradictory role of law for women in Canada, building upon role of insights offered by feminist cross-disciplinary legal scholarship. Prerequisite: W ST 201 or consent of the Program.

### W ST 431 Feminism and Sexual Assault

★3 (fi 6) (either term, 3-0-0). Interdisciplinary consideration of conceptual, political and legal strategies that feminists have deployed to confront sexual coercion with

an emphasis on contemporary North American context. Prerequisite: W ST 201, or consent of the Program.

### W ST 440 Body Politics

★3 (fi 6) (either term, 3-0-0). An examination of contemporary theoretical approaches to bodies and embodiment, with particular emphasis on the ways that race, class, sexuality, gender, and (dis)ability shape bodily experience. Prerequisite: W ST 201 or consent of the Program.

### W ST 450 Transnational Feminisms

★3 (fi 6) (either term, 3-0-0). This course provides a deeper understanding of women's issues globally and across nations. Topics may include feminist theorizing, women's movements, development, human rights, reproductive politics and social governance. Prerequisite: W ST 201 or consent of the Program.

### W ST 460 Masculinities

★3 (fi 6) (either term, 3-0-0). This course surveys the status of masculinity and the emergence of contemporary masculinity studies. Prerequisite: W ST 201 or consent of the Program.

### W ST 470 Sexualities: Special Topics

★3 (fi 6) (either term, 3-0-0). This course offers advanced examination of selected issues in sexuality studies. Prerequisite: W ST 201 or consent of the Program.

### W ST 498 Topics in Women's Studies

★3 (fi 6) (either term, 0-3s-0). Prerequisite: W ST 201 or consent of the Program.

### W ST 499 Special Topics in Feminist Theory

★3 (fi 6) (either term, 3-0-0). This course offers advanced study of selected issues in current feminist theorizing. Prerequisite: W ST 201 or consent of the Program.

## Graduate Courses

### W ST 500 Directed Reading in Women's Studies

★3 (fi 6) (either term, 0-3s-0).

## 231.271 Work Experience, WKEXP

### Undergraduate Courses

### 231.271.1 Faculty of Agricultural, Life and Environmental Sciences Courses

#### WKEXP 981 Agricultural, Life and Environmental Sciences Work Experience I

★0 (fi 9) (Spring/Summer, unassigned). A four-month work placement for Faculty of Agricultural, Life and Environmental Sciences students admitted into the Internship program. The work experience provides the student with exposure to the practical application of their specialization and the general work environment. Evaluation is based on appraisal of employer and mentor.

#### WKEXP 982 Agricultural, Life and Environmental Sciences Work Experience II

★0 (fi 9) (first term, unassigned). A four-month work placement for Faculty of Agricultural, Life and Environmental Sciences students admitted into the Internship program. The work experience provides the student with exposure to the practical application of their specialization and the general work environment. Evaluation is based on appraisal of employer and mentor.

#### WKEXP 983 Agricultural, Life and Environmental Sciences Work Experience III

★0 (fi 9) (second term, unassigned). A four-month work placement for Faculty of Agricultural, Life and Environmental Sciences students admitted into the Internship program. The work experience provides the student with exposure to the practical application of their specialization and the general work environment. Evaluation is based on appraisal of employer and mentor.

### 231.271.2 Faculty of Arts Courses

#### WKEXP 801 Arts Work Experience I

★0 (fi 9) (either term, unassigned). A four-month work placement for Faculty of Arts students participating in the Cooperative Education route. The focus of the work experience will be for the student to gain an appreciation of the work environment related to their discipline. Prerequisite: consent of the Department in which the student is majoring.

#### WKEXP 802 Arts Work Experience II

★0 (fi 9) (either term, unassigned). A four-month work placement for Faculty of Arts students participating in the Cooperative Education route. The focus of the work experience will be for the student to gain an appreciation of the work environment related to their discipline. Prerequisite: WKEXP 801 and consent of the Department in which the student is majoring.

**WKEXP 803 Arts Work Experience III**

★0 (*fi 9*) (either term, unassigned). A four-month work placement for Faculty of Arts students participating in the Cooperative Education route. The focus of the work experience will be for the student to gain an appreciation of the work environment related to their discipline. Prerequisite: WKEXP 802 and consent of the Department in which the student is majoring.

**WKEXP 961 Psychology Work Experience I**

★0 (*fi 9*) (either term, unassigned). A four-month work placement for Psychology students in the Faculty of Arts in the Psychology Cooperative Program. The focus of the work experience will be for the student to gain an appreciation of the work environment. Prerequisite: consent of Department. [Faculty of Arts]

**WKEXP 962 Psychology Work Experience II**

★0 (*fi 9*) (either term, unassigned). A four-month work placement for Psychology students in the Faculty of Arts in the Psychology Cooperative Program. The focus of the work experience will be for the student to gain further knowledge of the work environment. Prerequisite: WKEXP 961. [Faculty of Arts]

**WKEXP 963 Psychology Work Experience III**

★0 (*fi 9*) (either term, unassigned). A four-month work placement for Psychology students in the Faculty of Arts in the Psychology Cooperative Program. The focus of the work experience is to further the student's knowledge of the working world. Prerequisite: WKEXP 962. [Faculty of Arts]

**231.271.3 Faculty of Business Courses****WKEXP 911 Business Work Experience I**

★0 (*fi 9*) (either term, unassigned). A four-month work placement for Business students admitted into the cooperative education option. The focus of the work experience will be for the student to gain an appreciation of the work environment. Evaluation will be based on the employer's performance appraisal, the cooperative education coordinator's site evaluation report, and the student's performance on the work-term report.

**WKEXP 912 Business Work Experience II**

★0 (*fi 9*) (either term, unassigned). A four-month work placement for Business students admitted into the cooperative education option. The focus of the work experience will be for the student to gain experience in their chosen field of specialization. Evaluation will be based on the employer's performance appraisal, the cooperative education coordinator's site evaluation report, and the student's performance on the work-term report. Prerequisite: WKEXP 911.

**WKEXP 913 Business Work Experience III**

★0 (*fi 9*) (either term, unassigned). A four-month work placement for Business students admitted into the cooperative education option. The focus of the work experience will be for the student to perform work directly related to their specialization. Evaluation will be based on the employer's performance appraisal, the cooperative education coordinator's site evaluation report, and the student's performance on the work-term report. Prerequisite: WKEXP 912.

**WKEXP 914 Business Work Experience IV**

★0 (*fi 9*) (two term or Spring/Summer, unassigned). An optional fourth four-month work placement for Business students admitted into the cooperative education option. The focus of the work experience will be for the student to perform work directly related to their specialization. Evaluation will be based on the employer's performance appraisal, the cooperative education coordinator's site evaluation report, and the student's performance on the work-term report. Prerequisite: WKEXP 913 and permission of the Business Co-operative Education Office.

**231.271.4 Faculty of Engineering Courses****WKEXP 901 Engineering Work Experience I**

★0.5 (*fi 7*) (either term or Spring/Summer, unassigned). A four-month work placement for Engineering students registered in the Cooperative Education Program. This work experience will provide the student with exposure to the practical application of engineering and the general work environment. Evaluation will be based on the employer's performance appraisal, the student's work term report, and the student's ability to learn from the experiences of the work term. Prerequisite: ENGG 299.

**WKEXP 902 Engineering Work Experience II**

★0.5 (*fi 7*) (either term or Spring/Summer, unassigned). A four-month work placement for Engineering students registered in the Cooperative Education Program. This work experience will provide the student with exposure to the practical application of engineering and the general work environment. Evaluation will be based on the employer's performance appraisal, the student's work term report, and the student's ability to learn from the experiences of the work term. Prerequisite: WKEXP 901.

**WKEXP 903 Engineering Work Experience III**

★0.5 (*fi 7*) (either term or Spring/Summer, unassigned). A four-month work placement for Engineering students registered in the Cooperative Education Program. This work experience will provide students with personal involvement in the practice of their engineering discipline commensurate with their level of

academic preparation. Evaluation will be based on the employer's performance appraisal, the student's work term report, and the student's ability to learn from the experiences of the work term. Prerequisite: WKEXP 902.

**WKEXP 904 Engineering Work Experience IV**

★0.5 (*fi 7*) (either term or Spring/Summer, unassigned). A four-month work placement for Engineering students registered in the Cooperative Education Program. This work experience will provide students with personal involvement in the practice of their engineering discipline commensurate with their level of academic preparation. Evaluation will be based on the employer's performance appraisal, the student's work term report, and the student's ability to learn from the experiences of the work term. Prerequisite: WKEXP 903.

**WKEXP 905 Engineering Work Experience V**

★3 (*fi 7*) (either term or Spring/Summer, unassigned). A four-month work placement for Engineering students registered in the Cooperative Education Program. This work experience will provide students with personal involvement in the practice of their engineering discipline commensurate with their level of academic preparation. Evaluation will be based on the employer's performance appraisal, the student's work term report, and the student's ability to learn from the experiences of the work term. Prerequisite: WKEXP 904.

**WKEXP 906 Engineering Work Experience VI**

★3 (*fi 6*) (either term or Spring/Summer, unassigned). A four-month work placement for students registered in the Biomedical Option in either Chemical, Materials, or Mechanical Engineering. This work experience will provide students with personal involvement in the practice of the biomedical engineering discipline. The work experience plan requires the approval from the Department prior to registration. At the completion of the four-month work term, students are required to submit a formal research report which will be assessed for credit. Prerequisite: completion of Term 4 in the Biomedical Option.

**231.271.5 Faculty of Medicine and Dentistry Courses****WKEXP 990 Pharmacology Work Experience I**

★0 (*fi 9*) (either term or Spring/Summer, unassigned). A required four-month work experience placement for Pharmacology Specialization or Honors students admitted into the Industrial Internship Program. This work experience will expose the student to the practical application of Pharmacology and the general work environment.

**WKEXP 991 Pharmacology Work Experience II**

★0 (*fi 9*) (either term or Spring/Summer, unassigned). A required four-month work experience placement for Pharmacology Specialization or Honors students admitted into the Industrial Internship Program. This work experience will expose the student to the practical application of Pharmacology and the general work environment.

**231.271.6 Faculty of Science Courses****WKEXP 931 Psychology Work Experience I**

★0 (*fi 9*) (either term, unassigned). A four-month work placement for Psychology students in the Faculty of Science in the Psychology Industrial Internship Program. The focus of the work experience will be for the student to gain an appreciation of the work environment. Prerequisite: consent of Department. [Faculty of Science]

**WKEXP 932 Psychology Work Experience II**

★0 (*fi 9*) (either term, unassigned). A four-month work placement for Psychology students in the Faculty of Science in the Psychology Industrial Internship Program. The focus of the work experience will be for the student to gain further knowledge of the work environment. Prerequisite: WKEXP 931. [Faculty of Science]

**WKEXP 933 Psychology Work Experience III**

★0 (*fi 9*) (either term, unassigned). A four-month work placement for Psychology students in the Faculty of Science in the Psychology Industrial Internship Program. The focus of the work experience is to further the student's knowledge of the working world. Prerequisite: WKEXP 932. [Faculty of Science]

**WKEXP 934 Psychology Work Experience IV**

★0 (*fi 1*) (either term or Spring/Summer, unassigned). A four-month work placement for Psychology students in the Faculty of Science in the Psychology Industrial Internship Program. The focus of the work experience is to further the student's knowledge of the working world. Prerequisite: WKEXP 933. [Faculty of Science]

**WKEXP 955 Science Work Experience I**

★0 (*fi 9*) (either term or Spring/Summer, unassigned). A four-month work placement for Faculty of Science Honors or Specialization students admitted into the Industrial Internship program. The focus of the internship will be for students to perform work directly related to their specialization. Work Experience registrations must be continuous. Prerequisite: consent of Department.

**WKEXP 956 Science Work Experience II**

★0 (*fi 9*) (either term or Spring/Summer, unassigned). A four-month work placement for Faculty of Science Honors or Specialization students admitted into the Industrial Internship program. The focus of the internship will be for students to perform



work directly related to their specialization. Work Experience registrations must be continuous. Prerequisite: consent of Department.

#### WKEXP 957 Science Work Experience III

★0 (*fi 1*) (either term or Spring/Summer, unassigned). A four-month work placement for Faculty of Science Honors or Specialization students admitted into the Industrial Internship program. The focus of the internship will be for students to perform work directly related to their specialization. Work Experience registrations must be continuous. Prerequisite: WKEXP 956.

#### WKEXP 958 Science Work Experience IV

★0 (*fi 1*) (either term or Spring/Summer, unassigned). A four-month work placement for Faculty of Science Honors or Specialization students admitted into the Industrial Internship program. The focus of the internship will be for students to perform work directly related to their specialization. Work Experience registrations must be continuous. Prerequisite: WKEXP 957.

## 231.272 Writing (Creative Write), WRITE

Department of English and Film Studies  
Faculty of Arts

### Undergraduate Courses

#### WRITE 294 Introduction to Writing Poetry

★3 (*fi 6*) (either term, 3-0-0). Lectures and workshops in which the student will be required to write poetry. Prerequisites: ★6 of junior English (or equivalent), and consent of Instructor(s) based on a portfolio (see Instructor for deadline).

#### WRITE 295 Introduction to Writing Fiction

★3 (*fi 6*) (either term, 3-0-0). Lectures and workshops in which the student will be required to write prose. Prerequisites: ★6 of junior English (or equivalent), and consent of Instructor(s) based on a portfolio (see Instructor for deadline).

#### WRITE 298 Introduction to Writing Nonfiction

★6 (*fi 12*) (two term, 3-0-0). To increase the student's ability to write clear nonfiction prose. Models of prose style will be central, combined with frequent practice in writing on the basis of such models. Prerequisite: ★6 of junior English (or equivalent).

#### WRITE 392 Intermediate Poetry

★3 (*fi 6*) (either term, 3-0-0). Lectures and workshops focusing on selected poetic technique and form. Prerequisite: WRITE 294 unless waived by Instructor. Consult Instructor for portfolio deadline.

#### WRITE 393 Intermediate Fiction

★3 (*fi 6*) (either term, 3-0-0). Lectures and workshops focusing on selected fiction techniques and form. Prerequisite: WRITE 295 unless waived by Instructor. Consult Instructor for portfolio deadline.

#### WRITE 394 Intermediate Creative Writing: Poetry

★6 (*fi 12*) (two term, 3-0-0). Prerequisite: WRITE 294 unless waived by Instructor. Consult Instructor for portfolio deadline.

#### WRITE 395 Intermediate Creative Writing: Fiction

★6 (*fi 12*) (two term, 3-0-0). Prerequisite: WRITE 295 unless waived by Instructor. Consult Instructor for portfolio deadline.

#### WRITE 397 Intermediate Nonfiction

★3 (*fi 6*) (either term, 3-0-0). Lectures and workshop focusing on selected elements of nonfiction technique and form. Prerequisite: WRITE 298 unless waived by Instructor.

#### WRITE 398 Intermediate Creative Writing: Nonfiction

★6 (*fi 12*) (two term, 3-0-0). Prerequisite: WRITE 298 unless waived by Instructor.

#### WRITE 399 Projects in Genre

★3 (*fi 6*) (either term, 3-0-0). Lectures and workshops emphasizing innovations across genres and/or specialized writing forms. Note: variable content course which may be repeated. Prerequisite: 200-level WRITE course unless waived by Instructor. Consult Instructor for portfolio deadline.

#### WRITE 494 Advanced Creative Writing: Poetry

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: WRITE 394 unless waived by Instructor. Consult Instructor for portfolio deadline.

#### WRITE 495 Advanced Creative Writing: Fiction

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: WRITE 395 unless waived by Instructor. Consult Instructor for portfolio deadline.

#### WRITE 498 Advanced Creative Writing: Nonfiction

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: WRITE 398 unless waived by Instructor.

#### WRITE 532 Tutorial: Fourth-Year Combined Honors Creative Writing

★3-6 (*variable*) (variable, variable). In the third year of the Combined Honors in Creative Writing program, the Honors student, in consultation with the Department,

will arrange for a writing project under the guidance of a member of the Department for the ensuing summer and winter. The project is to be an original creative project judged by the Department to be the equivalent of a half-year creative writing course for ★3 or a full-year creative writing course for ★6.

## 231.273 Writing Studies, WRS

Office of Interdisciplinary Studies  
Faculty of Arts

### Undergraduate Courses

#### WRS 101 Exploring Writing

★3 (*fi 6*) (either term, 0-3s-0). This workshop course focuses on both the theory and practice of the writing process to help students experience firsthand how university writers enter into rich ongoing conversations by engaging with the words and ideas of others.

#### WRS 102 Writing in the Disciplines

★3 (*fi 6*) (either term, 0-3s-0). A workshop course emphasizing the use of writing-to-learn and process-oriented writing strategies as a way to enhance students' engagement with as well as understanding and articulation of course content. Note: variable content course [may be repeated]. Consult the Department and/or the University timetable for the specific topics offered. Prerequisite: Consent of program. [Office of Interdisciplinary Studies]

#### WRS 103 An Introduction to Writing in the Sciences

★3 (*fi 6*) (either term, 0-3s-0). Basic principles and genres of writing for science students. Note: Restricted to students in the Faculty of Science.

#### WRS 301 Introduction to Writing Centre Practice

★3 (*fi 6*) (either term, 0-3s-0). Introduces students to the primary themes of interdisciplinary writing studies and collaborative learning necessary to successfully work as peer writing coaches in a university writing centre. Building on the foundation of theory, the course guides students through coaching sessions to synthesize an appropriate coaching practice. Prerequisites: ★6 selected from 100-level ENGL and WRS 101, or consent of the instructor.

#### WRS 302 Proposal Writing

★3 (*fi 6*) (either term, 0-3s-0). This workshop course focuses on how to write proposals for grant funding. Students will study the genre as well as work with a social service agency to write funding proposals based on the needs of the agency.

#### WRS 402 Theories of Rhetoric

★3 (*fi 6*) (either term, 0-3s-0). This seminar introduces students to influential theories of rhetoric. Students will discuss and apply the theories in their analysis of contemporary texts and situations.

#### WRS 497 Special Topics in Writing Studies

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: Consent of Program [Office of Interdisciplinary Studies].

### Graduate Courses

#### WRS 500 Academic Writing

★3 (*fi 6*) (either term, 0-3s-0). This workshop course examines how to create persuasive, well-supported arguments in different genres in academic writing in all disciplines. Graduate students at all levels in all disciplines are welcome.

#### WRS 580 Directed Reading in Writing Studies

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: consent of program.

#### WRS 597 Special Topics in Writing Studies

★3 (*fi 6*) (either term, 0-3s-0).

#### WRS 600 The Teaching of Writing

★3 (*fi 6*) (either term, 0-3s-0).

#### WRS 601 Composition Theory

★3 (*fi 6*) (either term, 0-3s-0).

#### WRS 602 History of Rhetoric

★3 (*fi 6*) (either term, 0-3s-0).

#### WRS 603 Writing Centre Theory

★3 (*fi 6*) (either term, 0-3s-0). Introducing students to research in writing studies with a focus on writing in the disciplines and in writing centres.

#### WRS 604 Writing and Disciplinarity

★3 (*fi 6*) (either term, 0-3s-0).

#### WRS 605 Issues in Second Language Writing

★3 (*fi 6*) (either term, 0-3s-0).

## 231.274 Zoology (Biological Sciences), ZOO

Department of Biological Sciences  
Faculty of Science

### Notes

- (1) See the following sections for listings of other Biological Sciences courses: Bioinformatics (BIOIN); Biology (BIOL); Botany (BOT); Entomology (ENT); Genetics (GENET); Microbiology (MICRB).
- (2) See the following sections for listings of other relevant courses: Interdisciplinary Studies (INT D); Immunology and Infection (IMIN); Marine Science (MA SC); Paleontology (PALEO).

### Undergraduate Courses

#### **O** ZOO 224 Vertebrate Diversity

★3 (fi 6) (first term, 3-0-3). A comparative survey of vertebrates, focusing on their morphology, classification, and phylogeny. Prerequisite: BIOL 108 or SCI 100.

#### **O** ZOO 241 Animal Physiology I: Homeostasis

★3 (fi 6) (first term, 3-1s-0). Survey of physiological systems that regulate levels of gases, food, energy, temperature, water, and ions. Examples from invertebrates and vertebrates. Students with credit in PHYS 210 or 212 or 214 may not obtain credit in ZOO 241. Prerequisite: BIOL 107 or SCI 100.

#### **O** ZOO 242 Animal Physiology II: Intercellular Communication

★3 (fi 6) (second term, 3-1s-0). Endocrinology, immunology and neural, sensory, motor, and reproductive physiology. Examples from invertebrates and vertebrates. Students with credit in PHYS 210 or 212 or 214 may not obtain credit in ZOO 242. Prerequisite: BIOL 107 or SCI 100.

#### **O** ZOO 250 Survey of the Invertebrates

★3 (fi 6) (second term, 3-0-3). The functional anatomy and life cycles of the major invertebrate taxa are emphasized. Prerequisite: BIOL 108 or SCI 100.

#### **O** ZOO 303 Animal Developmental Biology

★3 (fi 6) (first term, 3-0-3). An introduction to basic principles in animal development both in vertebrates and invertebrates. This course examines how the molecular, cellular and comparative approaches are integrated to explain the development of the egg into the embryo, and the cellular interactions that culminate in the development of organ systems. Prerequisite: BIOL 201 or CELL 201. Credit may be obtained in only one of ENT 202, ZOO 202 and ZOO 303.

#### **O** ZOO 325 Comparative Anatomy of the Vertebrates

★3 (fi 6) (second term, 3-0-3). A comparative survey of form and function in vertebrate animals. Lectures focus on patterns of evolution and adaptation. Laboratories offer detailed examinations of major organ systems in representative species. Prerequisite: a 200-level ZOO course; ZOO 224 strongly recommended. May not be taken for credit if credit already obtained in ZOO 225.

#### **O** ZOO 340 Comparative Environmental Physiology

★3 (fi 6) (second term, 3-0-0). A comparative examination of the integrated responses of animals to environmental changes. This course focuses on both the acute physiological and long-term adaptations to dealing with environmental challenges. Focus is on biochemical and physiological responses to extreme environments. Prerequisite: ZOO 241 or PHYS 210 or 212 or 214.

#### **O** ZOO 342 Neurobiology

★3 (fi 6) (second term, 3-0-0). Nerve cells, nervous systems and neuromuscular systems from molecular, physiological, behavioral, and developmental perspectives. Examples from both invertebrates and vertebrates are given. Prerequisite: ZOO 242 or PHYS 210 or 212.

#### **O** ZOO 343 Comparative Endocrinology

★3 (fi 6) (first term, 3-0-0). Endocrine systems and actions of hormones at the tissue, cell and molecular levels; vertebrate systems are emphasized. Prerequisite: ZOO 242 or PHYS 210 or 212 or 214.

#### **O** ZOO 344 Laboratory Exercises in Animal Physiology

★3 (fi 6) (first term, 1-0-4). Physiological topics are reinforced in experimental lab exercises. Labs include computer simulations, artificial tissue models and animal models. Prerequisite: ZOO 241 or 242 or PHYS 210 or 212 or 214.

#### **O** ZOO 351 Freshwater Invertebrate Diversity

★3 (fi 6) (first term, 3-0-3). Emphasis is on an identified collection of invertebrates found in Alberta's lakes and streams. Lecture material pertains mainly to ecological features of the various fresh water groups. Prerequisite: ZOO 250. Offered in alternate years.

#### **O** ZOO 352 Principles of Parasitism

★3 (fi 6) (first term, 3-3s-0). An introduction to protozoan, helminth and arthropod parasites of animals; principles of host and parasite adaptations, host defense, pathology, epidemiology, and ecology, and control of parasitic infections. World wide web-based laboratory tutorials emphasize morphology, life cycles, behavior,

systematics and life history of parasites. Prerequisite: a 200-level Biological Sciences course (ZOO 250 and IMIN 200 recommended).

#### **O** ZOO 354 Wildlife Disease

★3 (fi 6) (second term, 3-0-3). Occurrence, principles, concepts, causes and significance of disease in wildlife. Laboratory exercises emphasize methods for the study of parasites of wild hosts. Prerequisite: one of BIOL 208, ENCS 376, ZOO 250.

#### **O** ZOO 370 Ethological Mechanisms

★3 (fi 6) (second term, 3-0-3). Animal behavior from an ethological perspective, with emphasis on the mechanisms underlying a variety of behaviors. The material is intended to complement that of ZOO 371. Prerequisite or corequisite: ZOO 241 or 242.

#### **O** ZOO 371 Behavioral Ecology

★3 (fi 6) (first term, 3-0-3). Animal behavior from an ecological and evolutionary perspective, with emphasis on social behavior. The material is intended to complement that of ZOO 370. Prerequisite: BIOL 208

#### **O** ZOO 402 Current Topics in Developmental Biology

★3 (fi 6) (second term, 0-3s-0). Discussion of selected topics in animal developmental biology from a molecular and cellular perspective. Evaluation of the primary literature and communication skills are emphasized. Prerequisite: ENT 302, or ZOO 302 or 303. Credit for this course may be obtained more than once. Offered in alternate years.

#### **O** ZOO 405 Biology of Fishes

★3 (fi 6) (first term, 3-0-3). A survey of fish diversity focussing on the morphology, systematics, behavior, and ecology of the major groups. Laboratories feature extensive use of departmental collections, with an emphasis on Alberta species. Prerequisites: ZOO 325 or both ZOO 224 and a 300-level Biological Sciences course. Offered in alternate years.

#### **ZOO 406 Biology of Amphibians and Reptiles**

★3 (fi 6) (first term, 3-0-3). A survey of amphibian and reptile diversity focussing on morphology, systematics, behaviour, and ecology of major groups, within a phylogenetic and evolutionary framework. Laboratories feature extensive use of departmental collections, and include Albertan species. This course will normally include traditional lectures and student seminars. Prerequisite: ZOO 325 or both ZOO 224 and a 300-level Biological Sciences course. Offered in alternate years.

#### **O** ZOO 407 Biology of Birds

★3 (fi 6) (either term, 3-0-3). A survey of bird diversity focussing on the morphology, systematics, behaviour, and ecology of the major groups. Laboratories feature extensive use of departmental collections, with an emphasis on Alberta species. Prerequisites: ZOO 325 or both ZOO 224 and a 300-level Biological Sciences course.

#### **O** ZOO 408 Biology of Mammals

★3 (fi 6) (second term, 3-0-3). A survey of mammal diversity focussing on the morphology, systematics, behavior, and ecology of the major groups. Laboratories feature extensive use of departmental collections, with an emphasis on Alberta species. Prerequisites: ZOO 325 or both ZOO 224 and a 300-level Biological Sciences course.

#### **O** ZOO 434 Field Course in Animal Ecology

★3 (fi 6) (first term, 0-0-6). Design, execution, analysis, and presentation of field problems in behavioral, population, and community ecology in both terrestrial and aquatic habitats. Field problems and independent projects will take place during the two weeks preceding the Fall term at a field station off the main campus. Presentation of results take place during four weeks of class time in September. Prerequisites: BIOL 331 or 332 or ZOO 371; a statistics course or BIOL 430. Requires payment of additional student instructional support fees. Refer to the Fees Payment Guide in the University Regulations and Information for Students section of the Calendar.

#### **O** ZOO 441 Current Topics on Homeostasis

★3 (fi 6) (either term, 0-3s-0). Discussion of selected topics in cardiac, gut, renal, respiratory, temperature, and metabolic physiology. Evaluation of the primary literature and communication skills are emphasized. Prerequisite: ZOO 340. Credit for this course may be obtained more than once. Offered in alternate years.

#### **O** ZOO 442 Current Topics in Intercellular Communication

★3 (fi 6) (either term, 0-3s-0). Discussion of selected topics in endocrinology, immunology, and neurobiology from molecular, cellular, and whole-animal perspectives. Evaluation of the primary literature and communication skills are emphasized. Prerequisite: ZOO 342 or 343 or 352 or PMCOL 371. Credit for this course may be obtained more than once. Offered in alternate years.

#### **ZOO 450 Development and Evolution of Form**

★3 (fi 6) (second term, 2-0-3). Invertebrate evolution and adaptations including topics on feeding and nutrition, motility, reproduction and development, and sensory systems. Emphasis will be on material from the primary literature. Laboratory exercises will involve advanced training in techniques of microscopy. Prerequisite:

ZOOL 250, ZOOL 303 and ZOOL 351 recommended. Credit cannot be obtained for both ZOOL 450 and 550.

**0 ZOOL 452 Experimental Parasitology**

★3 (*fi 6*) (second term, 3-0-3). Experimental approaches to the study of parasitism, including topics on ecology, biochemistry, cell biology, genetics, molecular biology, pathology, and immunology of host-parasite relationships. Laboratory exercises cover experimental design, methods of collecting and processing host and parasite samples, and evaluation of parasitic infections in hosts. The emphasis is on parasites of laboratory hosts. Prerequisite: ZOOL 352 or MMI 426 or consent of instructor.

**0 ZOOL 465 Wildlife Population Dynamics**

★3 (*fi 6*) (first term, 3-0-3). Principles and concepts of wildlife population dynamics, and applications for management, harvesting and conservation. Credit cannot be obtained for ZOOL 465 by students who already have credit for BIOL 467. Prerequisite: BIOL 331 or 332.

**0 ZOOL 472 Current Problems in Behavioral Ecology**

★3 (*fi 6*) (either term, 0-3s-0). Discussion of behavioral problems with ecological implications. Prerequisites: ZOOL 370 or 371 or consent of instructor. Offered in alternate years.

## Graduate Courses

### Notes

- (1) All 300- and 400-level courses in the Department of Biological Sciences may be taken for credit (except for BIOL 490, 498 and 499) by graduate students with approval of the student's supervisor or supervisory committee.
- (2) The following courses may be taken as an option in graduate programs in the Department of Biological Sciences with approval of the student's supervisor or supervisory committee: BIOCH 510, 520, 530, 541, 550, 555, 560; CHEM 361, 363, 461; CELL 300, 301; ENCS 510; IMIN 371, 372, 452, 501; MA SC 400, 401, 402, 410, 412, 420, 425, 430, 437, 440, 445, 470, 480; MMI 405, 415; NEURO 472; NU FS 363; PALEO 418, 419; PHARM 601.

**ZOOL 502 Advanced Current Topics in Developmental Biology**

★3 (*fi 6*) (second term, 0-3s-0). Discussion of selected topics in animal developmental biology from a molecular and cellular perspective. Evaluation of the primary literature and communication skills are emphasized. Discussions are the same as for ZOOL 402, but with additional assignments and evaluation appropriate to graduate studies. Prerequisite: consent of instructor. Credit may be obtained more than once. Offered in alternate years.

**ZOOL 541 Advanced Current Topics on Homeostasis**

★3 (*fi 6*) (either term, 0-3s-0). Discussion of selected topics in cardiac, gut, renal, respiratory, temperature, and metabolic physiology. Evaluation of the primary literature and communication skills are emphasized. Discussions are the same as for ZOOL 441, but with additional assignments and evaluation appropriate to graduate studies. Prerequisite: consent of instructor. Credit may be obtained more than once. Offered in alternate years.

**ZOOL 542 Advanced Current Topics in Intercellular Communication**

★3 (*fi 6*) (either term, 0-3s-0). Discussion of selected topics in endocrinology, immunology, and neurobiology from molecular, cellular, and whole-animal perspectives. Evaluation of the primary literature and communication skills are emphasized. Discussions are the same as for ZOOL 442, but with additional assignments and evaluation appropriate to graduate studies. Prerequisite: consent of instructor. Credit may be obtained more than once. Offered in alternate years.

**ZOOL 550 Advanced Development and Evolution of Form**

★3 (*fi 6*) (second term, 2-0-3). Invertebrate evolution and adaptations including topics on feeding and nutrition, motility, reproduction and development, and sensory systems. Emphasis will be on material from the primary literature. Laboratory exercises will involve advanced training in techniques of microscopy. Lectures and labs are the same as for ZOOL 450, but with additional assignments and evaluation appropriate to graduate studies. Prerequisite: consent of instructor. Credit cannot be obtained for both ZOOL 450 and 550.

**ZOOL 552 Advanced Parasitology**

★3 (*fi 6*) (second term, 2-1s-3). Formal lectures, seminars and individual projects emphasize the use of parasites as model systems for the study of fundamental questions in biology. Prerequisites: ZOOL 352 and ZOOL 452, or consent of instructor.