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## 200 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.”

For courses offered by the Faculty of Engineering, the ★ symbol is at the end of the course description and the accompanying number indicates the weight of the course as used in computing grade point averages for students who are registered in a faculty other than the Faculty of Engineering.

- (2) □—This symbol stands for “course units” and is used with courses offered by the Faculty of Engineering only. The number following the symbol indicates the units of the course used in computing grade point averages for students registered in the Faculty of Engineering. The number of units is based on the number of hours of lectures, seminars, and laboratories.
- (3) *fi*—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 *fi* 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.

- (4) (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.

- (5) **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.

- (6) **[Department]**—This indicates the department responsible for registration for interdepartmental courses. Normally, courses will be credited to the discipline listed in the square brackets.

- (7) **Open Studies Courses**—**□** indicates a course available to students of Open Studies. **L** indicates that a course is available to Open Studies students on a delayed registration basis only (see §190.2.2).

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

Students are strongly advised to refer to the *Registration Procedures* manual 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 Timetable Listing because they consist of part A and part B (e.g., English 101A and 101B).

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.

## Course Availability

The appearance of a course description in the following list does not guarantee that the course will actually be offered in the forthcoming session. Information about courses to be offered, names of instructors, and all further details must be sought from the appropriate department.

## Alternative Delivery Courses

Sections of certain approved courses may be offered in an Alternative Delivery format at an increased rate of fee assessment.

## 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.

# 201 Course Listings

## 201.1 Accounting, ACCTG

Department of Accounting and Management 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 Financial Accounting

★3 (fi 6) (either term, 3-0-0). Accounting and reporting to persons outside of the organization. Note: Not open to students registered in the Faculty of Business.

### ACCTG 311 Introductory Accounting

★3 (fi 6) (either term, 3-1.5s-0). 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. Note: Students are expected to have basic familiarity with microcomputer applications. Prerequisites: ECON 101 and 102.

### ACCTG 322 Managerial Information and Control Systems

★3 (fi 6) (either term, 3-0-0). Corporate goals, planning and control concepts, cost accumulation for pricing purposes, and product costing. Note: Students are expected to have basic familiarity with microcomputer applications. Prerequisite: ACCTG 311.

### ACCTG 413 Financial Information and Capital Markets

★3 (fi 6) (either term, 3-0-0). The use of financial accounting information for financial decision making. Four main topics consist of the nature of the demand for financial information, properties of the financial statement numbers, use of the information in decision making, and the structure of the environment in which the decisions are made. The financial decision makers envisioned include investors, bankers, regulators, competitors, suppliers, unions, managers, and purchasers. Prerequisites: ACCTG 311, FIN 301 and MGTSC 312.

### ACCTG 414 Intermediate Financial Accounting I

★3 (fi 6) (either term, 3-0-0). One of two courses covering the theory, methods, strengths, and weaknesses of current Generally Accepted Accounting Principles (GAAP). Prerequisites: ACCTG 311, 322.

### ACCTG 415 Intermediate Financial Accounting II

★3 (fi 6) (either term, 3-0-0). The second of two courses covering the theory, methods, strengths, and weaknesses of current Generally Accepted Accounting Principles (GAAP) in Canada. See ACCTG 414. Prerequisite: ACCTG 414. Corequisite: FIN 301.

### ACCTG 416 Accounting Theory

★3 (fi 6) (either term, 3-0-0). Structure of accounting theory, including a thorough study of theories of income and value relevant to accounting. A framework for evaluating these theories, including theories supporting Generally Accepted Accounting Principles, is considered. Other current topics in financial accounting may be included. Prerequisites: ACCTG 414, FIN 301. Open only to fourth-year Business students, or by consent of the Department Chair.

### ACCTG 418 Advanced Financial Accounting

★3 (fi 6) (either term, 3-0-0). Analysis of complex accounting problems, emphasizing current issues in accounting practice. Prerequisites: ACCTG 414, 415. Open only to fourth-year Business students or by consent of the Department Chair.

### ACCTG 424 Intermediate Managerial Control Concepts

★3 (fi 6) (either term, 3-0-0). Accounting for managerial decision making. Emphasis on cost and revenue accumulation for control and pricing problems as well as on product costing. Linear programming and regression are used in the analysis. Prerequisites: ACCTG 322 and MGTSC 312. There is a consolidated exam for ACCTG 424.

### ACCTG 426 Advanced Managerial Control Concepts

★3 (fi 6) (either term, 3-0-0). Current research and cases in managerial accounting. Prerequisite: ACCTG 424. Open only to fourth-year Business students or by consent of the Department Chair.

### 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 Auditing History, Theory, and Current Thought

★3 (fi 6) (either term, 3-0-0). Internal and external auditing history and philosophy. Functional or operational auditing, the nature of evidence, ethics, and independence. Prerequisite: ACCTG 414.

### ACCTG 467 Basic Income Tax

★3 (fi 6) (either term, 3-0-0). Basic income tax concepts and regulations from the view of tax professionals. The following are covered: organization of the Income Tax Act; residency of individuals and corporations for the purposes of determining liability for Canadian tax; employment income; individual and corporate business income; capital gains and losses for individuals and corporations; other sources of income and deductions for individuals. The logic behind provisions of the Income Tax Act, Interpretation Bulletins and the Income Tax Application rules are addressed where applicable to provide a structure for understanding income tax. Basic tax planning is introduced. Prerequisite: ACCTG 311.

### 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 488 Selected Topics in Accounting

★3 (fi 6) (either term, 3-0-0). Prerequisites: ACCTG 311, ACCTG 322.

### ACCTG 494 Individual Research Projects

★3 (fi 6) (either term, 3-0-0). Special study for advanced undergraduates. Prerequisite: consent of Instructor and Associate Dean.

### ACCTG 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.

### 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

★1.5 (fi 3) (either term, 18 hours). 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. The course begins to develop students' abilities to evaluate and interpret financial information through basic financial analysis. Offered in a six-week period.

### ACCTG 511 Accounting Information and Decision Making

★1.5 (fi 3) (either term, 18 hours). Accounting concepts used by management in planning and decision making. The role and importance of budgeting as a tool in planning and controlling operations, and relates budgeting to the financial statements introduced in ACCTG 501. Relevant costs for decision making are introduced, with emphasis on the relationships of cost, volume, and profit. Basic concepts underlying the design of accounting systems for measuring performance. Cases provide the context within which accounting information is generated and decisions are made. Offered in a six-week period. Prerequisite: ACCTG 501.

### ACCTG 521 Accounting and Business Management

★1.5 (fi 3) (either term, 18 hours). New material in financial reporting and managerial accounting aids the integration of material covered in ACCTG 501 and 511. Topics that integrate with marketing, finance, and economics. Factors affecting the selection of accounting policies and their informational effects for external users. Similar issues are approached from an internal management perspective including an analysis of factors that influence the design of accounting systems. Offered in a six-week period. Prerequisite: ACCTG 511.

### 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 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. Prerequisite: MGTS 521, ACCTG 521 and FIN 531.

### 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 521.

### 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.

### 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.

### ACCTG 618 Seminar in Current Accounting Issues

★3 (fi 6) (either term, 3-0-0). The application of accounting theory to controversial areas in financial reporting. The topics covered represent an extension of the content of ACCTG 616 and vary according to the changing importance of current issues. Prerequisite: ACCTG 616.

### 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.

### ACCTG 626 Seminar in Managerial Control

★3 (fi 6) (either term, 3-0-0). Current research and cases in managerial accounting. Prerequisite: ACCTG 522.

### ACCTG 631 Accounting for the Public Sector

★3 (fi 6) (either term, 3-0-0). An examination of concepts and practices of accounting as they relate to organizations in the public sector, such as governments and Crown or similar corporations. This includes appropriate references to the accounting concepts and practices used in the private sector and the relevance of them to the public sector. Prerequisite: ACCTG 512 or equivalent.

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

★3 (fi 6) (either term, 3-0-0). This course examines internal and external auditing history and philosophy, functional or operational auditing, and the nature of evidence, ethics, and independence. Prerequisite: ACCTG 614.

### 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 Introduction to Accounting Research

★3 (fi 6) (either term, 3-0-0). A survey/history of accounting thought, introducing the major research approaches in accounting.

### ACCTG 702 Economic Approaches to Accounting Research

★3 (fi 6) (either term, 3-0-0). An introduction to the economics-based paradigm of accounting research, focussing particularly on empirical studies of accounting choice and role of accounting information in capital markets. Prerequisites: MGTS 705 (or equivalent).

### 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 analyse the research of others. This workshop is a single term course offered over the full session. 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 704 Advanced Topics in Accounting Research

★3 (fi 6) (either term, 3-0-0). In-depth study of specific approaches to accounting research. The topic chosen will be based on the needs of students and the research interests of Faculty. The focus will be on developing students' ability to produce publishable research. A 704 course may actually comprise two, or even three, segments of related research. Students registered for a PhD in Accounting are required to register in at least two terms (two different topics).

### ACCTG 705 Individual Research

★3 (fi 6) (either term, 3-0-0).

### 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.

## 201.2 Agricultural Economics, AG EC

Department of Rural Economy

Faculty of Agriculture, Forestry, and Home Economics

**Note:** See also Forest Economics (FOREC), Interdisciplinary Undergraduate Courses (INT D) and Rural Sociology (R SOC) listings for related courses.

### Undergraduate Courses

#### 0 AG EC 316 Quantitative Methods

★3 (fi 6) (either term, 3-0-2). Introduction to matrix algebra and linear models including linear programming, input-output analysis, and related techniques. Emphasis is on the use of these techniques for economic analysis in agriculture, forestry, and the environment. Prerequisite: Pure Mathematics 30. Note: Not open to students with credit in MATH 120, 127.

#### 0 AG EC 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 101/102.

#### 0 AG EC 333 Introduction to Farm and Ranch Management

★3 (fi 6) (either term, 3-0-2). Application of economic principles to the organization and operation of a farm business. Introduction to farm records and business analysis; the management process and decision criteria for choice of enterprises, size of business, resource use, and timing of production; alternative methods of obtaining farming resources by purchase, leasing and credit. Prerequisite: ECON 101.

#### 0 AG EC 373 Agricultural Policy

★3 (fi 6) (either term, 3-0-0). Economic policy aspects of the production, marketing, and income problems of farmers. Beliefs, values, institutions and participants in agriculture and their interaction in the development of economic policies for the industry. Prerequisite: ECON 101/102.

#### 0 AG EC 384 Prices and Markets I

★3 (fi 6) (either term, 3-0-1). Marketing of agricultural, forest and food products: theory and application. Topics include price determination in cash and futures markets, alternative market structures, domestic and foreign governmental intervention, international trade, product quality and grading. Prerequisite: ECON 101/102.

#### 0 AG EC 400 Special Topics

★3 (fi 6) (either term, 0-3s-0). Individual study of a selected topic or problem requiring both written and oral reports. Prerequisite: consent of the Department Chair.

**AG EC 416 Statistical Analysis**

★3 (fi 6) (either 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.

**AG EC 420 Mathematical Programming in Agriculture and Forestry**

★3 (fi 6) (first term, 3-0-3). Mathematical programming methods applied to the analysis of production systems in agriculture and forestry. Prerequisite: AG EC 316 or MATH 120 or MATH 200.

**AG EC 423 Advanced Management Techniques for Agri-Food, Environmental, and Forestry Businesses**

★3 (fi 6) (either term, 0-3s-0). Applying principles and techniques in planning, organizing, and controlling of businesses. A case study approach is used to develop specific management applications to agricultural, environmental, food, and forestry businesses. Not open to students in the Agricultural/Food Business Management program. Prerequisite: AG EC 323 or consent of Instructor.

**AG EC 433 Advanced Farm and Ranch Management**

★3 (fi 6) (either term, 3-0-0). Applying concepts and tools of farm business management in farm planning and farm management extension. Manual and computerized methods of farm accounting, business analysis and planning; interpretation and use of information for decision making in organizing and operating a farm business to achieve goals; planning under risk and uncertainty; farm business arrangements and strategies for growth. Prerequisite: AG EC 333.

**AG EC 475 Agricultural and Rural Development**

★3 (fi 6) (either term, 3-0-0). Characteristics of underdevelopment in rural economies. Current theories and practices to stimulate agricultural and rural economic growth. Agricultural technology, capital formation, market adjustments and integrated programs. Development planning, project identification, design and appraisal. Principles of coordination, budgeting, public involvement and evaluation; both Canadian and international applications are stressed. Prerequisite: One of INT D 303, INT D 356, or AG EC 373.

**AG EC 482 Cooperatives and Alternative Business Institutions**

★3 (fi 6) (either term, 3-0-0). Evaluation of the role of alternative institutions to the investor-owned firm (emphasizing cooperatives but including marketing boards and crown corporations). Effects of differing incentive structures in alternative institutions on market prices and quantities. Additional topics: role of incentive structures in business organizations, effects on community development of alternative business organizations, relationship between market structure and choice of business organization. Prerequisite: 300-level AG EC course or ECON 281.

**AG EC 484 Prices and Markets II**

★3 (fi 6) (either term, 3-0-0). Analysis of markets for agricultural and food products. Topics may include economic theory and analysis of alternative market structures, market performance, market regulation, cooperatives, marketing boards, advertising, product quality and grading, food safety, commodity futures markets, empirical price analysis, the role of information in marketing, transportation cost issues, and firm locations. Prerequisite: AG EC 384.

**AG EC 485 Agricultural Trade Policy**

★3 (fi 6) (either term, 3-0-0). Principles and policies affecting international trade in agricultural and food products. Forms of protection, including tariffs, quotas, and non-tariff barriers, and their consequences. Current and likely trade related institutions, including GATT, regional trade arrangements and customs unions. Effects of changes in trade policy on agriculture and the overall economy. Prerequisite: AG EC 384.

**AG EC 487 Commodity Futures and Options Markets**

★3 (fi 6) (either term, 3-0-0). Study of the mechanics and economic functions of commodity futures and options markets. Topics include the theory and practice of hedging, intertemporal price formulation and uses in business management. Emphasis on development of a conceptual framework and analytical capability to evaluate the behavior and performance of futures and options markets. Prerequisite: AG EC 384; AG EC 416 and 434 recommended.

**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) The following undergraduate courses may be taken for credit by graduate students: AG EC 406, 416, 423, 433, 435, 475, 484.

**AG EC 500 Research Projects in Agricultural 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. Note: May be repeated for credit one time. Prerequisite: consent of the Department Chair.

**AG EC 502 Applied Demand Analysis**

★3 (fi 6) (either term, 3-0-0). Principles of consumer demand analysis including theoretical and empirical approaches to the analysis of consumer choice. Applications include food demand analysis, analysis of consumer choice under

uncertainty (food safety, nutrition, health), dynamic consumer choice, advertising and consumer choice, preference shifts in consumer choice, and economic welfare measurement. Prerequisite: ECON 481.

**AG EC 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.

**AG EC 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.

**AG EC 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; AG EC 502 and 416 recommended.

**AG EC 534 Agricultural Finance**

★3 (fi 6) (either term, 3-0-0). Capital budgeting and financing issues relating to farms and small businesses. Risk measurement and management. Agency and information problems and the relation between farm and small business investment and security markets. Cost of capital and valuation of farm and small business assets. Financing alternatives and the choice between them. Evaluation of public programs which affect agricultural and small business financing and risk control. Prerequisite: AG EC 434 or FIN 301.

**AG EC 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; AG EC 416 and 502 recommended.

**AG EC 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; AG EC 475 and 502 recommended.

**AG EC 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. AG EC 502 and 416 recommended.

**AG EC 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.

**AG EC 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.

**AG EC 900 Directed Research Project**

★3 (fi 6) (variable, unassigned).

**201.3****Agricultural, Food and Nutritional Science, AFNS**

Department of Agricultural, Food and Nutritional Science  
Faculty of Agriculture, Forestry, and Home Economics

**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.

**Graduate Courses****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 520 Ruminant Physiology**

★3 (*fi 6*) (first term, 3-0-0). A lecture and discussion course on current literature in digestive physiology and endocrinology of ruminant animals. Offered in even numbered years. Prerequisite: ★3 in each of Nutrition and Physiology.

**AFNS 525 Animal Systems Modeling**

★3 (*fi 6*) (second term, 3-0-3). Application of systems analysis techniques and computer simulation in research and management of livestock and wildlife production systems. Prerequisite: consent of Instructor. Credit cannot be obtained in both AN SC 551 and AFNS 525.

**AFNS 530 Plant Breeding Methods**

★3 (*fi 6*) (second term, 3-0-0). Theory and application in plant breeding. Topics include technological application of plant genetics, design of efficient breeding systems (including biotechnology approaches), application of quantitative methods, development of new crop species, gene patents, and special breeding problems. Extensive reference to literature, and guest visits by plant breeders. Offered in even-numbered years. Prerequisite: PL SC 465. Credit cannot be obtained for PL SC 503 and AFNS 530.

**AFNS 535 Epidemiology of Plant Diseases**

★3 (*fi 6*) (second term, 1-3s-0). Reproduction, spread and survival of soil-borne plant pathogens. Monitoring and modeling of disease and crop loss progression. Plant pathosystems and principles of breeding for disease resistance. Critical evaluation of current literature will be stressed. Offered in odd-numbered years. Prerequisite: consent of Instructor. Credit cannot be obtained for PL SC 580 and AFNS 535.

**AFNS 540 Plant Disease Diagnostics**

★3 (*fi 6*) (variable, 0-0-6). Identification of diseases of field, greenhouse and forest crops. A disease collection is required. (Also offered in Spring/Summer.) Credit cannot be obtained for PL SC 520 and AFNS 540.

**AFNS 566 Advanced Food Microbiology**

★3 (*fi 6*) (second term, 3-1s-0). A lecture/discussion course on selected topics in food microbiology. Offered in alternate years. Prerequisite: MICRB 265 or NU FS 361 or 363. Credit cannot be obtained for NU FS 566 and AFNS 566.

**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 600 Professional Development**

★1 (*fi 2*) (first term, 0-3s-0). Provides graduate students information and experience to achieve high quality scientific presentations and other professional competencies.

**AFNS 601 Seminar**

★1 (*fi 2*) (either term, 0-1s-0). Provides a forum in which graduate students prepare and present seminars or papers at both general and technical levels. Attendance is required of all graduate students. Students participate actively as presenters, discussants and evaluators.

**AFNS 602 Graduate Reading Project**

★3 (*fi 6*) (variable, 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*) (variable, 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 604 Teaching Dossier**

★1 (*fi 2*) (two term, 0-0-3). This course is for students who will prepare a teaching dossier as part of their graduate studies. Course requirements are overseen by the Department Graduate Committee in consultation with the student's supervisory committee. Requirements include attendance at courses offered by University Teaching Services, laboratory lectures and instruction, and teaching of a series of selected classes. Teaching assignments are critically evaluated by a panel of assessors. A final evaluation of the student's teaching potential will be provided for inclusion in the teaching dossier. Prerequisite: consent of Supervisory Committee.

**AFNS 615 Techniques in Molecular Genetics**

★3 (*fi 6*) (second term, 0-0-6). A laboratory research approach to the use of molecular biology techniques in prokaryotic and eukaryotic cells. Emphasis on interdisciplinary aspects and new techniques. Prerequisites: GENET 270 and consent of Instructor. Credit cannot be obtained for PL SC 601 and AFNS 615.

**AFNS 620 Bioenergetics**

★3 (*fi 6*) (second term, 3-0-0). Lecture and reading course in bioenergetics. Review of current literature on selected topics in energy metabolism of animals in relation to age, growth, lactation and environmental adaptation. Offered in odd numbered years starting in 1999/2000. Prerequisites: ★3 in each of Physiology and Nutrition.

**AFNS 650 Advances in Food Science and Nutrition**

★3 (*fi 6*) (two term, 1-1s-0). Current research developments in microbiology,

chemistry, engineering, processing, and quality of food. Prerequisite: consent of Instructor. Credit cannot be obtained for NU FS 650 and AFNS 650.

**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)**

★3-6 (*variable*) (variable, variable). Individual study supervised by the student's supervisory committee, requiring the preparation of a comprehensive report and presentation of a seminar. Open only to students in the MAg or MEng program.

## 201.4 Agriculture and Forestry, AGFOR

Faculty of Agriculture, Forestry, and Home Economics

### Undergraduate Courses

**AGFOR 100 Global Ecosystems and Human Involvement**

★3 (*fi 6*) (either term, 3-0-0). An introduction to structure, function, classification, and dynamics of ecosystems with particular emphasis on interactions between humans and their environment. Topics include resource conservation, sustainability, and economics; land and ecological ethics.

**AGFOR 204 Communication Theory and Practice**

★3 (*fi 6*) (either term, 3-0-3). Introduction to the principles of interpersonal, group, and public communication. Practice in oral and visual communication is emphasized in laboratories. Open only to Faculty of Agriculture, Forestry, and Home Economics students.

## 201.5 Anaesthesia, ANAES

Department of Anaesthesia  
Faculty of Medicine and Dentistry

**Note:** Instruction in theoretical aspects of anaesthetic practice is included in PMCOL 421.

### Undergraduate Courses

**ANAE 446 Student Internship**

★1.5 (*fi 3*) (either term, 2 weeks). Student Internship, for Students in Phase III MD program only.

### Course Beginning in 2000-2001

**ANAE 546 Anaesthesia Student Internship**

★2 (*fi 4*) (either term, 2 weeks). Student Internship in Anaesthesia, for students registered in the MD program.

## 201.6 Anatomy and Cell Biology, ANAT

Department of Cell Biology and Anatomy  
Faculty of Medicine and Dentistry

### Undergraduate Courses

**ANAT 200 Human Morphology**

★3 (*fi 6*) (either term, 3-0-0). Overview of human structure. Emphasis on the systems of the body and their cooperative role in normal function. Lecture course open to Pharmacy and Dental Hygiene students only.

## 201.7 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. Prérequis: ANDR 510 ou l'accord du Vice-doyen aux affaires académiques.

### ANDR 551 Sujets choisis en éducation des adultes

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Le contenu varie d'une année à l'autre. Note: ce cours est destiné aux détenteurs d'un diplôme du 1er cycle.

## 201.8 Anglais, ANGL

Faculté Saint-Jean

### Notes

- (1) Un seul cours complet (ou 2 demi-cours) au niveau 100 peut être crédité pour le BA.
- (2) Prérequis pour les cours au niveau 200: ANGL 101.

### Undergraduate

#### ANGL 101 Critical Reading and Writing

★6 (fi 12) (two term, 3-0-0). A critical study of literature in English, concentrating on works written since 1800, with a minimum 30% of class time devoted to writing instruction. Note: Not to be taken by students with credit in ANGL 100 or ANGL 110 or in ENGL 104/105.

#### ANGL 113 English as a Second Language

★6 (fi 12) (two term, 3-0-1). Designed to enable students to communicate in oral and written English. Work in a language laboratory is combined with a review of English grammar and study of English literature and textbook prose to help students achieve a greater proficiency in spoken and written English. Students must take a placement test (MELAB) to determine their proficiency, and register in the proper course or section (see Faculté Saint-Jean faculty section). The placement test (two hours in duration) is taken at the Faculté Saint-Jean in the first two days of the term. Open only to students enrolled in one of Faculté Saint-Jean's programs. Note: ANGL 113 is not recognized by the Faculty of Arts as an acceptable substitute for ENGL 101. Formerly ANGL 213.

## 201.9 Animal Science, AN SC

Department of Agricultural, Food and Nutritional Science  
Faculty of Agriculture, Forestry, and Home Economics

**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.

The following course was renumbered effective 1995/96:

Old	New
AN SC 376	ENCS 376

### Undergraduate Courses

#### AN SC 110 Equine Physiology and Nutrition

★3 (fi 6) (first term, 3-0-0). Principles of digestive, exercise, environmental, and reproductive physiology. Nutrient requirements of the horse; sources of energy and nutrients; feed formulation. Not available to students with credit in 300-level courses in animal physiology and nutrition.

#### 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: ★3 in university-level biology.

#### AN SC 309 Animal Housing

★3 (fi 6) (second term, 3-0-3). Methods of providing acceptable environments for confined animals. Topics include animal well-being, technology to maintain good air quality, minimizing the impact of intensive livestock operations on receiving environments, and farmstead planning. Prerequisite: AN SC 200 or ★3 in university-level biology.

#### AN SC 310 Physiology of Domestic Mammals and Birds I

★3 (fi 6) (first term, 3-0-3). Fundamental principles of regulation and maintenance of the internal environment. Lectures and laboratories devoted to the study of mechanisms providing for homeostasis and well-being of domestic mammals and birds in response to changes in the external (e.g. light, temperature, social) environment. Prerequisites: ZOO 120 or BIOL 107 plus ★6 in university-level chemistry.

#### AN SC 311 Physiology of Domestic Mammals and Birds II

★3 (fi 6) (second term, 3-0-3). The physiological basis of the productive processes in domestic mammals and birds. Lectures and laboratories addressing the study

of the physiological mechanisms of digestion, metabolism, growth, reproduction, and lactation. Prerequisites: ZOO 120 or BIOL 107 and ★6 in university-level chemistry.

#### 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.

#### AN SC 374 Animal Health and Welfare

★3 (fi 6) (first term, 3-0-0). General principles of disease and disease prevention. Prevention of major reproductive, respiratory, and digestive diseases in farm animals. Promotion of health, welfare, and prevention of disease through proper management. Prerequisite: ★3 in university-level biology.

#### AN SC 385 Animal Improvement

★3 (fi 6) (second term, 3-0-2). Application of genetic principles to the improvement of livestock and poultry. Prerequisites: GENET 197 or BIOL 107/207 and third year standing or higher.

#### AN SC 391 Metabolism

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

#### AN SC 400 Individual Study

★3 (fi 6) (variable, 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.

#### AN SC 410 Regulation of Reproduction in Domestic Animals

★3 (fi 6) (first term, 0-2s-3). 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. Prerequisites: AN SC 310 and 311; or ZOO 343 or equivalent.

#### 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. Prerequisites: ★3 in Biochemistry or AN SC 320, or consent of Instructor.

#### AN SC 461 Ruminant Digestion, Metabolism, and Nutrition

★3 (fi 6) (second term, 3-0-0). Topics in ruminant digestion, metabolism, and nutrition. Prerequisites: (NUTR 260 or NUTR 301 or NUTR 302) and AN SC 311.

#### AN SC 471 Applied Poultry Science

★3 (fi 6) (second term, 3-0-3). Study of modern poultry production based on an understanding of avian anatomy, physiology, behavior, health, breeding, and nutrition. Emphasis on interaction of the above parameters through group research projects with commercial poultry. Prerequisite: AN SC 200 or consent of Instructor.

#### AN SC 472 Applied Dairy Science

★3 (fi 6) (first term, 3-0-3). Integration of the nutritional, physiological and biochemical processes involved in the production of quality milk. Structure of the dairy industry and evaluation of management practices to optimize production efficiency and animal well-being. Laboratory involves analysis of modern dairy production systems with a view to optimizing profitability. Prerequisite: AN SC 200 or consent of Instructor.

#### 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. Prerequisite: AN SC 200 or consent of Instructor.

#### AN SC 475 Wildlife Production

★3 (fi 6) (second term, 3-0-3). Biological, technical, legal, and economic basis of the international wildlife farming and ranching industries. Opportunities for livestock diversification with emphasis on elk, bison, and exotics. Prerequisite: AN SC 200 or consent of Instructor.

#### AN SC 476 Swine Production and Management

★3 (fi 6) (first term, 3-0-3). Review of functions, production practices, and efficiencies in various sectors of the Swine industry. Evaluation of breeding, feeding, housing management, and disease prevention practices that optimize production efficiency and animal well-being. The laboratory period involves analysis of the production efficiency of a commercial swine unit. Prerequisite: AN SC 200 or consent of Instructor.

#### AN SC 484 Animal Molecular Biology

★3 (fi 6) (first term, 2-1s-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, PL SC 331 and AN SC 391, or consent of Instructor.



## Graduate Courses

### Notes

- (1) All 400-level courses in AN SC may be taken for credit by graduate students with approval of the student's supervisor or supervisory committee.
- (2) See also Agricultural, Food and Nutritional Science (AFNS) listing for related courses.

## 201.10 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. Anciennement ANTHE 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. Anciennement ANTHE 210.

#### **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. Prérequis: ANTHE 101.

#### **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. Prérequis: ANTHE 101 ou 201.

#### **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 328 Expression esthétique

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Le rôle de l'expression esthétique dans l'évolution humaine ainsi que les théories générales de l'expression esthétique, et les liens entre la culture et les arts. Prérequis: ANTHE 207 ou l'accord du Vice-doyen aux affaires académiques.

## 201.11 Anthropology, ANTHR

Department of Anthropology  
Faculty of Arts

### Notes

- (1) See also INT D 120 and 443 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) Students with credit in ANTHR 202 have the equivalent of ANTHR 101 or 201.
- The following table lists renumbered courses effective 1990/91:

Old	New
ANTHR 201	ANTHR 101
ANTHR 210	ANTHR 110
ANTHR 250	ANTHR 150

The following table lists renumbered courses effective 1991/92:

Old	New	Old	New
ANTHR 201	ANTHR 101	ANTHR 356	ANTHR 256
ANTHR 210	ANTHR 110	ANTHR 361	ANTHR 261
ANTHR 250	ANTHR 150	ANTHR 362	ANTHR 262
ANTHR 319	ANTHR 219	ANTHR 370	ANTHR 270
ANTHR 325	ANTHR 225	ANTHR 371	ANTHR 271
ANTHR 327	ANTHR 227	ANTHR 378	ANTHR 278
ANTHR 330	ANTHR 230	ANTHR 379	ANTHR 279
ANTHR 346	ANTHR 246	ANTHR 380	ANTHR 280
ANTHR 350	ANTHR 250	ANTHR 385	ANTHR 285

The following table lists renumbered courses effective 1993/94:

Old	New	Old	New
ANTHR 245	ANTHR 344	ANTHR 424	ANTHR 324
ANTHR 306	ANTHR 206	ANTHR 427	ANTHR 328
ANTHR 307	ANTHR 207	ANTHR 447	ANTHR 348
ANTHR 308	ANTHR 208	ANTHR 450	ANTHR 350
ANTHR 309	ANTHR 209	ANTHR 466	ANTHR 366
ANTHR 403	ANTHR 311	ANTHR 467	ANTHR 367
ANTHR 405	ANTHR 312	ANTHR 550	ANTHR 585
ANTHR 406	ANTHR 313	ANTHR 552	ANTHR 584
ANTHR 410	ANTHR 310	ANTHR 554	ANTHR 587
ANTHR 418	ANTHR 318	ANTHR 556	ANTHR 586
ANTHR 423	ANTHR 323		

### Undergraduate Courses

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

★3 (fi 6) (either term, 3-0-0). General introduction to Anthropology through the study of central concepts and key issues. Human evolution, the appearance of culture, social organization, cultural theory, symbolic systems, culture change. Note: Not open to students with credit in ANTHR 201 or 202.

#### **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 in the Modern World

★3 (fi 6) (either term, 3-0-0). The challenge of racism in modern societies and the response of anthropology, including the history of the 'race' concept in explaining human variation and the uses of racist notions in discussions of individual and social differences.

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

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

#### **0** 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 anthropology or consent of Department.

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

★3 (fi 6) (either term, 2-1s-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 anthropology or consent of Department.

#### **0** ANTHR 209 Introduction to Physical 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.

#### **1** ANTHR 227 Indigenous and Cultural Minorities in the Modern World

★3 (fi 6) (either term, 3-0-0). Survival of indigenous and minority cultures in various societies. Anthropological perspectives on relationships among race, class, culture, and politics, and on genocide, ethnocide, and the future of native peoples in the modern state. Offered in alternate years.

#### **1** 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 246 Peoples and Cultures of the Circumpolar Region

★3 (fi 6) (either term, 3-0-0). Comparative study of indigenous Arctic and sub-Arctic societies. Archaeological and ethnological considerations of northern societies of the Old and New Worlds. Offered in alternate years.

#### **1** ANTHR 250 North American Aboriginal Peoples

★3 (fi 6) (either term, 3-0-0). Aboriginal North American cultures through selected ethnographies and other sources. Offered in alternate years.

#### **1** ANTHR 256 Alberta Archaeology

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

**ANTHR 261 Peoples and Cultures of Middle America**

★3 (fi 6) (either term, 3-0-0). The cultural history of the native peoples of Mexico and Guatemala. Analysis of contemporary Indian communities. Offered in alternate years.

**ANTHR 262 Peoples and Cultures of South America**

★3 (fi 6) (either term, 3-0-0). The cultural history of the native peoples of South America. Analysis of contemporary Indian communities. Offered in alternate years.

**ANTHR 270 Peoples and Cultures of Oceania**

★3 (fi 6) (either term, 3-0-0). Historical, economic, and environmental factors which have helped shape major cultures and subcultures of the central and southern Pacific region (Polynesia, Micronesia, Melanesia, and Australia). Offered in alternate years.

**ANTHR 271 Peoples and Cultures of Southeast Asia**

★3 (fi 6) (either term, 3-0-0). Cultures and societies in Southeast Asia: Burma, Thailand, Malaysia, Cambodia, Laos, Vietnam, Indonesia, and the Philippines; origins and developments, modern forms, trends of change. Offered in alternate years.

**ANTHR 278 Culture and Society of China**

★3 (fi 6) (either term, 3-0-0). Development of Chinese culture and society; social structure, religion, technology, economy, and polity in anthropological perspective.

**ANTHR 279 Culture and Society of Korea**

★3 (fi 6) (either term, 3-0-0). Development of Korean culture and society; social structure, religion, technology, economy, and polity in anthropological perspective. Offered in alternate years.

**ANTHR 280 Culture and Society of Japan**

★3 (fi 6) (either term, 3-0-0). Historical background, ethos and personality, social structure, religion, art, and modernization.

**ANTHR 283 Peoples and Cultures of Western Africa**

★3 (fi 6) (either term, 3-0-0). The cultures of sub-Saharan West Africa and the Zaire basin.

**ANTHR 284 Peoples and Cultures of Eastern and Southern Africa**

★3 (fi 6) (either term, 3-0-0). The indigenous cultures of the eastern portion of Africa from Ethiopia to South Africa.

**ANTHR 285 African Culture and Art**

★3 (fi 6) (either term, 3-0-0). Analysis of the cultural and artistic heritage of Africa from Paleolithic times to the present, with emphasis on ethnographic Western and Central Africa. Offered in alternate years.

**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. Offered in alternate years.

**ANTHR 312 Lower Paleolithic Prehistory**

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

**ANTHR 313 Middle and Upper Paleolithic Prehistory**

★3 (fi 6) (second term, 3-0-0). Development of prehistoric culture in Europe, Africa, and Asia during the middle and upper Paleolithic. 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. Note: Not open to students with credit in ANTHR 420. Offered in alternate years.

**ANTHR 322 Anthropological Perspectives on Human Communication**

★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 328 Creative Expression**

★3 (fi 6) (first term, 3-0-0). The role of aesthetic expression in human evolution; general theories of aesthetic expression; and the relation between aesthetic expression, personality, and culture. Prerequisite: ANTHR 207 or consent of Department. Offered in alternate years.

**ANTHR 331 Anthropology of Technology**

★3 (fi 6) (either term, 2-1s-0). An investigation into the character of contemporary technology, emphasizing theories and field methods used in the interpretation of technological change. Focus is on a different setting each term, eg., the workplace, the internet, industrial sites, video arcades. Prerequisite: ANTHR 230, or one of 206 to 209, 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 340 Anthropological Perspectives on North American Aboriginal Peoples**

★3 (fi 6) (either term, 3-0-0). Topics and issues in North American Aboriginal studies. Consult the Department and/or University timetable for specific topic offered in each year. Prerequisite: ANTHR 207 or 250 or consent of Department. Offered in alternate years.

**ANTHR 344 Holocene Prehistory of Europe**

★3 (fi 6) (either term, 3-0-0). Survey of the prehistory of Europe (excluding the areas of classical civilizations) from the Mesolithic through the Iron Age: ca. 10,000 to 400 BC. Prerequisite: ANTHR 206. 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 366 Theories of Culture Change**

★3 (fi 6) (either term, 3-0-0). Theories of the nature of socio-cultural systems and the processes of change. Prerequisite: ANTHR 207 or consent of Department. Offered in alternate years.

**ANTHR 367 Applied Anthropology**

★3 (fi 6) (either term, 3-0-0). The application of anthropologists' theory and method to contemporary problems of development. Prerequisite: ANTHR 207 or consent of Department. Offered in alternate years.

**ANTHR 370 Women in East Asian Societies**

★3 (fi 6) (either term, 3-0-0). A comparative examination of women's positions and roles in East Asian societies. Effects of law, social practice, and Confucian ideology on familial and economic structures. Prerequisite: ANTHR 278, 279, or 280, or consent of Department. Offered in alternate years.

**ANTHR 390 Human Osteology**

★3 (fi 6) (first 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. Offered in alternate years.

**ANTHR 392 Primate Behavior**

★3 (fi 6) (either term, 3-0-0). Emphasis on field studies of non-human primates. Topics to include social organization, behavior and ecology, territorial behavior communication, reproductive behavior, and other relevant topics. Formerly ANTHR 292.

**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 Instructor.

**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.

**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 407 Paleopathology**

★3 (*fi 6*) (either term, 3-0-0). 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 414 Peasant Society and Culture**

★3 (*fi 6*) (either term, 0-3s-0). Modes of production, social organization and other aspects of culture in agrarian societies, including anthropological perspectives on development. Prerequisites: ANTHR 207 and one other senior-level course. Offered in alternate years.

**ANTHR 415 History of Anthropological Theory**

★3 (*fi 6*) (either term, 3-0-0). An investigation of the theory and method of anthropology from the nineteenth century to the present, focussing on sociocultural and linguistic anthropology. The course traces development of idealist and materialist approaches to the cross-cultural understanding of society. Prerequisites: ANTHR 207 or 208 and a 300- or 400-level anthropology course, or consent of Department.

**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 425 Anthropology of Work and Production**

★3 (*fi 6*) (either term, 3-0-0). Organization of work and production, emphasizing the effects of development on subsistence economies. Prerequisite: ANTHR 207 or consent of Department. Offered in alternate years.

**ANTHR 430 Anthropological Approaches to Symbolism**

★3 (*fi 6*) (either term, 3-0-0). A review of symbolic approaches in anthropology as applied to classification, ideology, ceremonial usages, forms of social action and social relationships. Prerequisite: ANTHR 207 or 320 or consent of Department. Offered in alternate years.

**ANTHR 433 The Ethnographic Study of Meaning**

★3 (*fi 6*) (either term, 3-0-0). An exploration of the theory and practice of 'writing culture' through reconsideration of classic and contemporary ethnographic monographs, together with recent contributions to contemporary cultural theory. Prerequisites: ANTHR 207 or 208 and a 300- or 400-level anthropology course, 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 441 Archaeometry**

★3 (*fi 6*) (first term, 3-0-0). Analytical methodology for interpreting the material record of the past; structures of materials at the microscopic and macroscopic levels; raw materials and production technologies; provenance; dating; prospection; sampling and measure. Archaeological case studies are used throughout. Prerequisite: ANTHR 206 or consent of Department. Offered in alternate years.

**ANTHR 442 Applications of Archaeometry**

★3 (*fi 6*) (second term, 0-0-3). A project course concerned with the interpretation of the material record of the past. Exposure to archaeometric laboratory techniques, and to the interpretation of results. A specific research project is to be undertaken. Prerequisite: ANTHR 441 or consent of Department. Offered in alternate years.

**ANTHR 445 Circumpolar Prehistory**

★3 (*fi 6*) (either term, 3-0-0). A critical examination of archaeological method and theory applied to circumpolar regions. Prerequisites: ANTHR 246, one other course in anthropology, or consent of Department. Offered in alternate years.

**ANTHR 446 Circumpolar Ethnology**

★3 (*fi 6*) (either term, 3-0-0). A critical examination of anthropological models applied to traditional societies in the circumpolar regions. Prerequisites: ANTHR 246, one other course in anthropology, or consent of Department. Offered in alternate years.

**ANTHR 455 Aboriginal Rights**

★3 (*fi 6*) (either term, 3-0-0). Topics related to the concept of Aboriginal rights; questions about 'special' political rights of Aboriginal peoples in Canada. Prerequisite: Introductory course in social or cultural anthropology, or history, or political science, or sociology, or consent of Department. Offered in alternate years.

**ANTHR 463 The Origins of Food Production**

★3 (*fi 6*) (either term, 0-3s-0). Archaeological evidence for the development of food production in the Old and New Worlds, discussed in the context of the major explanatory theories advanced. Prerequisite: ANTHR 206 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 473 Dene Society in Anthropological Perspective**

★3 (*fi 6*) (either term, 3-0-0). A critical examination of anthropological perspectives on Dene society, culture, and ethnohistory. Prerequisite: ANTHR 101 or 207 or consent of Department. Offered in alternate years.

**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 475 Advanced Topics in the Anthropology of Japan**

★3 (*fi 6*) (either term, 0-3s-0). An examination of anthropological approaches to the study of Japan and considers how Japanese society is presented by Japanese and foreign commentators. Stereotypes of Japanese society and bases for those views are examined. Where and how changes are occurring in views of Japan and in the society itself are examined through specific topics. Offered in alternate years.

**ANTHR 479 Geoarchaeology**

★3 (*fi 6*) (first term, 3-0-3). Application of earth science methods to archaeological research. Prerequisites: ANTHR 206 and one of GEOL 102/103, 201/204, 292, GEOG 130/131, or 330. Not open to students who have taken ANTHR 498. Offered in alternate years.

**ANTHR 481 Development of Archaeological Method and Theory**

★3 (*fi 6*) (either term, 3-0-0). A survey of approaches and practices used in archaeology before 1960; 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 484 Topics in Archaeology and/or Physical Anthropology**

★3 (*fi 6*) (either term, 0-3s-0). Consult the Department and/or the University timetable for the specific topic offered each year. Prerequisite: consent of Department.

**ANTHR 485 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 topic offered each year. Prerequisite: consent of Department.

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

★3 (*fi 6*) (either term, 0-3s-0). Consult the Department and/or the University timetable for the specific topic offered each year. Prerequisite: consent of Department.

**ANTHR 487 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 topic offered each year. Prerequisite: consent of Department.

**ANTHR 488 Quaternary Pollen Analysis**

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

**ANTHR 490 Human Osteoarchaeology**

★3 (*fi 6*) (either term, 0-3s-0). Seminar study of 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, 3-0-3). 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 492 Problems in Primate Behavior**

★3 (*fi 6*) (either term, 3-0-0). Examines kin selection in primates, sexual differentiation of behavior, evolution of primate behavior patterns, appropriateness of infraprimate analogies to human behavior. Prerequisite: ANTHR 392 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. Offered in alternate years.

**ANTHR 495 Archaeological Methods**

★3 (fi 6) (either term, 3-0-3). 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 496 Advanced Archaeological Field Training**

★6 (fi 12) (Spring/Summer, 0-3s-3). At a site to be selected, possibly overseas. Consult the Department and/or Spring/Summer timetable for the specific site each year. Prerequisite: ANTHR 396 or equivalent archaeological field training and consent of Department.

**ANTHR 497 Peopling of the Americas**

★3 (fi 6) (either term, 0-3s-0). A survey and critical appraisal of the evidence and theoretical positions bearing upon the entry, dispersal, settlement, and adaptations to various regions of the Americas by the original Amerindian colonists. Prerequisite: ANTHR 206, or 219, or consent of Department. Offered in alternate years.

**ANTHR 498 History of Physical Anthropology**

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

**ANTHR 499 Fourth-Year Honors Seminar and Honors Paper**

★6 (fi 12) (two term, 0-3s-0). Prerequisite: consent of Department.

**Graduate Courses****Notes**

- (1) See also INT D 594 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.
- (2) The following undergraduate courses may be taken for credit by graduate students: ANTHR 407, 414, 415, 419, 422, 425, 426, 428, 433, 435, 441, 442, 446, 455, 463, 465, 470, 471, 472, 473, 478, 479, 481, 484, 485, 486, 487, 488, 490, 491, 492, 494, 495, 497.

**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 508 Methods in Linguistic Anthropology**

★3 (fi 6) (either term, 0-3s-3). Selected topics in field methods and analytic techniques used by linguistic anthropologists, and their extensions in socio-cultural anthropology. Prerequisite: consent of Department. Offered in alternate years.

**ANTHR 509 Symbolic and Cognitive Analysis**

★3 (fi 6) (either term, 0-3s-0). Note: Not open to students with credit in ANTHR 504.

**ANTHR 511 Ethnographic Field Methods I**

★3 (fi 6) (first term, 0-3s-0). Prerequisite: consent of Department. Note: Not open to students with credit in ANTHR 401 or 505. Offered in alternate years.

**ANTHR 521 Topics in Medical Anthropology**

★3 (fi 6) (second term, 0-3s-0). Prerequisite: ANTHR 393 or 407; or consent of Department.

**ANTHR 531 Traditions, Technology and Knowledge**

★3 (fi 6) (either term, 0-3s-0). Examination of the relationships among technology, social practices and belief systems; role of technology in mediating societies' relationship with nature; and changes occurring in valued practices resulting from external perturbations. Comparison of local- and state-level systems of environmental management.

**ANTHR 532 Science and Culture**

★3 (fi 6) (either term, 0-3s-0). An examination of the perception of science in contemporary society and its formation. A review of debates concerning the theoretical positions of positivism, postmodernism, and the impact of feminist and postcolonial critiques on the formation of scientific thought. New directions within anthropology concerning cultures of science and science as culture are highlighted.

**ANTHR 535 Anthropology and the Nation-state**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: consent of Department. Restricted to graduate students in Anthropology, Sociology, Political Science, or Economics. 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. Prerequisite: consent of Department.

**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. Prerequisite: consent of the Department.

**ANTHR 581 Contemporary Archaeological Method and Theory**

★3 (fi 6) (either term, 0-3s-0). A survey of the approaches and practices used in archaeology since 1960. Prerequisite: ANTHR 481, or consent of Department. Offered in alternate years.

**ANTHR 584 Advanced Topics in Archaeology and/or Physical Anthropology**

★3 (fi 6) (either term, 0-3s-0). Consult the Department and/or the University timetable for the specific topic offered each year. Prerequisite: consent of Department.

**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 topic offered each year. Prerequisite: consent of Department.

**ANTHR 586 Advanced Seminar in Archaeology and/or Physical Anthropology**

★3 (fi 6) (either term, 0-3s-0). Consult the Department and/or the University timetable for the specific topic offered each year. Prerequisite: consent of Department.

**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 topic offered each year. Prerequisite: consent of Department.

**ANTHR 593 Evolution and Social Life**

★3 (fi 6) (either term, 0-3s-0). Theories of the origin and evolution of the human phenotype and ecological niche, the sexual division of labor, kinship and the family, language and self-awareness. Prerequisite: consent of Department. Offered in alternate years.

**ANTHR 598 Landscape and Culture**

★3 (fi 6) (either term, 0-3s-0). An examination of cultural experiences and representations of landscape. Topics may include the reconstruction of ancient environments, cultural ecology, environmental anthropology, ecological management and restoration, and the emerging field of landscape theory.

**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.

**201.12 Arabic, ARAB**

Department of Comparative Literature, Religion, and  
Film/Media 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 or they may be encouraged to seek "Credit by Special Assessment" (see §44.5) where 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 course, credit may be withheld.

**Undergraduate Courses****0 ARAB 100 Beginner's Arabic**

★6 (fi 12) (two term, 3-0-2). Introduction to pronunciation, reading, writing, and conversation for those with no previous knowledge of Arabic.

**0 ARAB 301 Intermediate Arabic I**

★3 (fi 6) (first term, 3-0-0). Continuation of ARAB 100, emphasizing building an extensive vocabulary in everyday situations. Continued efforts to improve oral skills. Prerequisite: ARAB 100 or consent of Department. Note: Not open to students with credit in ARAB 300.

**ARAB 302 Intermediate Arabic II**

★3 (*fi 6*) (second term, 3-0-0). Selected readings in ancient and modern literature. Exercises in comprehension, translation and composition. Further study of grammar. Prerequisite: ARAB 301 or consent of Department. Note: Not open to students with credit in ARAB 300.

**ARAB 499 Problems and Topics in Arabic Language and/or Literature**

★3-6 (*variable*) (variable, 0-3s-0). Prerequisite: consent of Department.

**201.13 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, students serve their best interest by regular attendance.

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

The following table lists renumbered courses effective 1990/91:

Old	New	Old	New
ART 231	ART 131	ART 233	ART 133
ART 232	ART 132	ART 368	ART 268

The following table lists renumbered courses effective 1992/93:

Old	New	Old	New
ART 312	ART 310/311	ART 414	ART 418/419
ART 313	ART 316/317	ART 512	ART 510/511
ART 412	ART 410/411	ART 513	ART 516/517
ART 413	ART 416/417	ART 514	ART 518/519

**Undergraduate Courses****ART 131 Visual Fundamentals**

★6 (*fi 12*) (two term, 0-6L-0). Studio-based introduction to the exploration and production, in two and three dimensions, of visually expressed information. Note: Not open to students with credit in ART 132.

**ART 132 Visual Fundamentals**

★6 (*fi 12*) (either term, 0-12L-0). Studio-based course providing BFA and BDesign students with an introduction to the exploration and production, in two and three dimensions, of visually-expressed information. Note: Restricted to BFA and BDesign students. Full course offered in the Fall.

**ART 133 Visual Fundamentals**

★6 (*fi 12*) (either term, 0-12L-0). Studio-based course providing BFA and BDesign students with further concentration in the exploration and production, in two and three dimensions, of visually expressed information. Prerequisites: ART 132 and consent of Department. Note: Full course offered in the Winter.

**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 132 and consent of Department.

**ART 268 Introduction to Studio**

★3 (*fi 6*) (first term, 0-6L-0). Directed study in one subject embraced by ART 322. Prerequisites: ART 131, or 132, 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 131 or 132 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; or ART 310 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 131 or 132 and consent of Department.

**ART 323 Printmaking: Introductory Studies II**

★6 (*fi 12*) (two term, 0-6L-0). Further study of the principles and technical applications of screen printing, relief and intaglio processes, emphasizing the use of color. Pre- or corequisites: ART 322 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 131 or 132 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 131 or 132 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. Offered in Spring/Summer only. Prerequisites: ART 131 or 132 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. Note: Restricted to BFA and BDesign students. Prerequisite: ART 140.

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

★3 (*fi 6*) (either term, 0-6L-0). Foundation studies in abstract sculpture. Prerequisites: ART 131 or 132, 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 131 or 132, 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 363 Sculpture: Introductory Studies III**

★6 (*fi 12*) (two term, 0-6L-0). Further foundation studies in sculpture. Pre- or corequisites: ART 361 and 362 and consent of Department.

**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 416 Painting: Intermediate Studies III**

★3 (*fi 6*) (first term, 0-6L-0). Project-based course exploring advanced principles, concepts and techniques of painting. Prerequisites: ART 310, 311, and prerequisite or corequisite ART 410 and consent of Department. Note: Not open to students with credit in ART 413.

**ART 417 Painting: Intermediate Studies IV**

★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 or 416 and consent of Department. Note: Not open to students with credit in ART 413.

**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 423 Printmaking: Intermediate Studies II**

★6 (*fi 12*) (two term, 0-6L-0). Further study of the principles and technical applications of lithography and etching with emphasis on the use of color. Pre- or corequisites: ART 422 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 462 Sculpture: Intermediate Studies I**

★6 (fi 12) (two term, 0-6L-0). Intermediate studies in sculpture. Prerequisites: ART 361 and 362 and/or consent of Department.

**ART 463 Sculpture: Intermediate Studies II**

★6 (fi 12) (two term, 0-6L-0). Further intermediate studies in sculpture. Prerequisite or corequisite: ART 462 and/or consent of Department.

**ART 464 Sculpture: Intermediate Studies III**

★6 (fi 12) (two term, 0-6L-0). Additional intermediate studies in sculpture. Prerequisite or corequisite: ART 463 and/or consent of Department.

**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.

**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.

**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.

**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.

**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.

**ART 523 Printmaking: Advanced Studies II**

★6 (fi 12) (two term, 0-6L-0). Continued advanced study of the principles and technical applications of printmaking emphasizing individual development. Pre- or corequisites: ART 522 and consent of Department.

**ART 524 Printmaking: Advanced Studies III**

★6 (fi 12) (two term or Spring/Summer, 0-6L-0). Advanced individual study of drawing and other image-making processes and their application in printmaking. Pre- or corequisites: ART 523 and consent of Department.

**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.

**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.

**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.

**ART 562 Sculpture: Advanced Studies I**

★6 (fi 12) (two term, 0-6L-0). Advanced studies in sculpture. Prerequisite: ART 462 and/or consent of Department.

**ART 563 Sculpture: Advanced Studies II**

★6 (fi 12) (two term, 0-6L-0). Further advanced studies in sculpture. Prerequisite or corequisite: ART 562 and/or consent of Department.

**ART 564 Sculpture: Advanced Studies III**

★6 (fi 12) (two term, 0-6L-0). Additional advanced studies in sculpture. Prerequisite or corequisite: ART 563 and/or consent of Department.

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

★10 (fi 20) (either term, 0-18L-0).

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

★10 (fi 20) (either term, 0-18L-0).

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

★10 (fi 20) (either term, 0-18L-0).

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

★10 (fi 20) (either term, 0-18L-0).

**ART 630 Seminar in Related Disciplines**

★3 (fi 6) (two term, 0-1s-0).

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

★10 (fi 20) (either term, 0-18L-0).

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

★10 (fi 20) (either term, 0-18L-0).

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

★10 (fi 20) (either term, 0-18L-0).

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

★10 (fi 20) (either term, 0-18L-0).

**201.14 Art de la scène, ARTSC**

Faculté Saint-Jean

**Cours de 1er cycle****ARTSC 300 Appréciation des arts de la scène**

★6 (fi 12) (aux deux semestres, 3-0-0). Introduction à l'histoire des arts de la scène, incursion dans les spectacles de théâtre, mime, masques, ombres, marionnettes, opéra-musical, ballet-danse, cirque, etc. Evaluation critique des spectacles auxquels les étudiants assistent. Anciennement ARTSC 200.

## 201.15 Art dramatique, ADRAM

Faculté Saint-Jean

### Cours de 1er cycle

#### **01 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. Anciennement ADRAM 202.

#### **01 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, la spontanéité. La découverte de l'improvographe.

#### **ADRAM 203 L'expérience du théâtre**

★3 (fi 6) (l'un ou l'autre semestre, 0-4L-0). Participation au processus complet de la production d'un spectacle: interprétation, scénographie, animation et mise en scène. Création d'une pièce choisie faisant partie d'un cours enseigné à la Faculté. Prérequis: ADRAM 101 et 103.

#### **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. Anciennement ADRAM 143.

#### **01 ADRAM 301 Survol historique du théâtre**

★6 (fi 12) (aux deux semestres, 3-0-0). Le développement des styles et des formes du spectacle théâtral et la 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.

#### **ADRAM 321 Créativité et théâtre pour jeunes**

★3 (fi 6) (l'un ou l'autre semestre, 2-3L-0). Approche pratique et théorique au développement des ressources humaines par l'art dramatique (de la conception à la réalisation d'un projet théâtral) tenant compte des enfants et des jeunes. Prérequis: ADRAM 101, ou l'accord du Vice-doyen aux affaires académiques.

#### **ADRAM 327 L'expérience du théâtre communautaire**

★3 (fi 6) (deuxième semestre, 1-4L-0). Etude des théories, des pratiques et du développement du théâtre populaire, communautaire et collectif en milieu adulte ou scolaire. Le côté pratique du cours implique la participation des étudiants dans le processus complet de la production d'un spectacle amateur d'une pièce dirigée par le coordonnateur du cours. Prérequis: ADRAM 101 et 103. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en ADRAM 203.

#### **ADRAM 359 Atelier d'improvisation**

★3 (fi 6) (l'un ou l'autre semestre, 0-6L-0). Pratique de la préparation et de la mise en marche des improvisations afin d'explorer la création des formes dramatiques. Prérequis: ADRAM 203 ou 327 ou l'accord du Vice-doyen aux affaires académiques.

#### **ADRAM 383 La mise en scène théâtrale**

★3 (fi 6) (deuxième semestre, 1-4L-0). Etude d'une variété de systèmes codifiés que représentent l'ensemble des arts du spectacle; sur les objectifs et défis des créateurs du théâtre; sur les sources et méthodes d'interprétation de textes littéraires. Exercices de mise en scène et extraits de productions de textes classiques ou contemporains. Prérequis: ADRAM 101 et 103. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en ADRAM 201.

#### **ADRAM 466 Analyse du théâtre canadien**

★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. Prérequis: FRANC 235 et ★3 en littérature de niveau 300, préféablement CA FR 350. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en CA FR 466.

#### **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. Prérequis: FRANC 235 et ★3 de littérature de niveau 300. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en FRANC 484.

## 201.16 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, where attendance is a factor in grading.

The following table lists renumbered courses effective 1990/91:

Old	New	Old	New
ART H 201	ART H 101	ART H 409	ART H 401
ART H 202	ART H 102	ART H 459	ART H 402
ART H 303	ART H 251	ART H 559	ART H 501

The following table lists renumbered courses effective 1992/93:

Old	New	Old	New
ART H 231	ART H 202	ART H 471	ART H 405
ART H 232	ART H 252	ART H 472	ART H 455
ART H 261	ART H 204	ART H 481	ART H 406
ART H 271	ART H 205	ART H 483	ART H 457
ART H 272	ART H 255	ART H 501	ART H 418
ART H 273	ART H 207	ART H 571	ART H 505
ART H 274	ART H 209	ART H 572	ART H 555
ART H 281	ART H 206	ART H 581	ART H 506
ART H 282	ART H 256	ART H 582	ART H 556
ART H 283	ART H 257	ART H 583	ART H 557

### Undergraduate Courses

#### **01 ART H 101 Introduction to the History of Art I**

★3 (fi 6) (either term, 3-0-0). Introduction to Western Art and Design to the end of the 14th century by analysis of selected works and movements.

#### **01 ART H 102 Introduction to the History of Art II**

★3 (fi 6) (either term, 3-0-0). Introduction to Western Art and Design from the 15th century to the present by analysis of selected works and movements.

#### **ART H 201 Survey of Early Christian to Ottonian Art**

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

#### **ART H 202 Survey of Renaissance Art I**

★3 (fi 6) (either term, 3-0-0). History of the visual arts of the 15th and 16th centuries in Northern Europe.

#### **ART H 203 Survey of Northern Baroque Art**

★3 (fi 6) (either term, 3-0-0). History of the visual arts of the 17th century in Northern Europe.

#### **ART H 204 Survey of 18th-Century Art**

★3 (fi 6) (either term, 3-0-0). History of the visual arts of Europe during the 18th century.

#### **ART H 205 Survey of 19th-Century Art I**

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

#### **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.

#### **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.

#### **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.

#### **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.

#### **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.

#### **ART H 252 Survey of Renaissance Art II**

★3 (fi 6) (either term, 3-0-0). History of the visual arts of the 15th and 16th centuries in Italy.

#### **ART H 253 Survey of Southern Baroque Art**

★3 (fi 6) (either term, 3-0-0). History of the visual arts of the 17th century in Southern Europe.

#### **ART H 255 Survey of 19th-Century Art II**

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

#### **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.

#### **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.

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

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

**ART H 401 Topics in Medieval Art**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: consent of Instructor. Students are normally expected to have successfully completed ART H 201 or 251 with a minimum grade of 6.0.

**ART H 402 Topics in Renaissance Art**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: consent of Instructor. Students are normally expected to have successfully completed ART H 202 or 252 with a minimum grade of 6.0.

**ART H 403 Topics in Baroque Art**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: consent of Instructor. Students are normally expected to have successfully completed ART H 203 or 253 with a minimum grade of 6.0.

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

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: consent of Instructor. Students are normally expected to have successfully completed ART H 205 with a minimum grade of 6.0.

**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. Students are normally expected to have successfully completed ART H 206 with a minimum grade of 6.0.

**ART H 407 Topics in Early Canadian Art**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: consent of Instructor. Students are normally expected to have successfully completed ART H 207 with a minimum grade of 6.0.

**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. Students are normally expected to have successfully completed ART H 210 with a minimum grade of 6.0.

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

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

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

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: consent of Instructor. Students are normally expected to have successfully completed ART H 255 with a minimum grade of 6.0.

**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. Students are normally expected to have successfully completed ART H 256 with a minimum grade of 6.0.

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

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: consent of Instructor. Students are normally expected to have successfully completed ART H 257 with a minimum grade of 6.0.

**ART H 501 Advanced Studies in Medieval Art**

★3 (*fi 6*) (either term, 0-3s-0). Intended for MA (History of Art and Design) students. Prerequisite: consent of Department.

**ART H 502 Advanced Studies in Renaissance Art**

★3 (*fi 6*) (either term, 0-3s-0). Intended for MA (History of Art and Design) students. Prerequisite: consent of Department.

**ART H 503 Advanced Studies in Baroque Art**

★3 (*fi 6*) (either term, 0-3s-0). Intended for MA (History of Art and Design) students. Prerequisite: consent of Department.

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

★3 (*fi 6*) (either term, 0-3s-0). Intended for MA (History of Art and Design) students. 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). Intended for MA (History of Art and Design) students. Prerequisite: consent of Department.

**ART H 507 Advanced Studies in Early Canadian Art**

★3 (*fi 6*) (either term, 0-3s-0). Intended for MA (History of Art and Design) students. 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). Intended for MA (History of Art and Design) students. Prerequisite: consent of Department.

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

★3 (*fi 6*) (either term, 0-3s-0). Intended for MA (History of Art and Design) students. Prerequisite: consent of Department.

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

★3 (*fi 6*) (either term, 0-3s-0). Intended for MA (History of Art and Design) students. 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). Intended for MA (History of Art and Design) students. Prerequisite: consent of Department.

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

★3 (*fi 6*) (either term, 0-3s-0). Intended for MA (History of Art and Design) students. Prerequisite: consent of Department.

**Graduate Courses****ART H 600 Historiography and Methodology**

★3 (*fi 6*) (either term, 0-3s-0). Intended for MA (History of Art and Design) students. Prerequisite: consent of Department.

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

★3 (*fi 6*) (either term, 0-3s-0). Intended for MA (History of Art and Design) students. Prerequisite: consent of Department.

**201.17 Astronomy, ASTRO**

Department of Physics  
Faculty of Science

**Undergraduate Courses****01 ASTRO 120 Astronomy of the Solar System**

★3 (*fi 6*) (first 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 and Physics 30. Note: Credit may be obtained for only one of ASTRO 110 or 120.

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

★3 (*fi 6*) (second 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 and Physics 30. Note: Credit may be obtained for only one of ASTRO 110 or 120.

**01 ASTRO 310 Astrophysics**

★6 (*fi 12*) (two term, 3-0-0). Summary of the concepts in physics and astronomy relevant to astrophysics; stellar spectra, atmospheres, interiors, and evolution; galactic structure; cosmology. Prerequisites: MATH 115, PHYS 143 or 102, and a 200-level Physics or Mathematics (PHYS 208 or 271 strongly recommended). Some additional knowledge of mathematics, astronomy, and physics would be advantageous. Note: The following specialized course in Astrophysics is offered by the Department of Physics: PHYS 465.

**201.18 Biochemistry, BIOCH**

Department of Biochemistry  
Faculty of Medicine and Dentistry

**Undergraduate Courses****Notes**

- (1) BIOCH 203, 205, 220, 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 Pathology.
- (3) Program note to common first year in Biological Sciences: Students in the Department of Biological Sciences who wish to enrol in a Biochemistry program after Year 1 or wish to take BIOCH 203 and 205 are advised that BIOCH 203 requires a prerequisite of ★6 of Organic Chemistry and ★3 of General Chemistry.

**01 BIOCH 203 Introduction Biochemistry I**

★3 (*fi 6*) (first term, 3-0-0). Structure and chemistry of the cell; protein structure and function; enzyme kinetics; chemistry of carbohydrates; intermediary metabolism. Prerequisite: CHEM 101; CHEM 161 or 261; and CHEM 163 or 263.



Notes: (1) Students with grades of less than 6.0 in any of these courses require consent of Department. (2) This course may not be taken for credit if credit has already been obtained in either BIOCH 201 or BIOCH 220.

### **Q BIOCH 205 Introduction Biochemistry II**

★3 (fi 6) (second term, 3-0-0). Chemistry and metabolism of lipids, amino acids, and nucleotides; membrane structure and assembly; molecular biology of nucleic acids. Prerequisite: BIOCH 203, or consent of Department. Note: this course may not be taken for credit if credit has already been obtained in BIOCH 201.

### **Q BIOCH 220 General Biochemistry**

★3 (fi 6) (either term, 3-0-0). Specific biomolecular systems have been selected as topics for presentation and in depth understanding of important general principles of biochemistry. Our goals are to provide students with an understanding of the structures and functions of proteins and biological membranes, and with an appreciation of the complexity and coordination in the design of cells and cellular metabolic systems. Prerequisite: CHEM 101; and CHEM 161 or 261. Note: Designed for students who do not plan to take further courses in Biochemistry. BIOCH 220 may not be taken for credit if credit has already been obtained in any of BIOCH 201, 203, or 205.

### **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 203 and 205, and consent of Department.

### **L BIOCH 410 Integration and Regulation of Metabolism**

★3 (fi 6) (second term, 3-0-0). Principles of metabolic regulation by hormones, intracellular signals, and protein modification. Biochemistry of cellular communication. Coordination of carbohydrate, lipid, nucleotide, and protein metabolism. Prerequisites: BIOCH 203 and 205 with minimum grades of 6.0, or consent of Department. Offered in alternate years. 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. Prerequisite: BIOCH 203 and 205 with minimum grades of 6.0, or consent of Department. Offered in alternate years. Intended for undergraduate students. Graduate students may not register for credit (see BIOCH 520).

### **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 203 and 205 with minimum grades of 6.0, or consent of Department. Offered in alternate years. 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 203 and 205 with minimum grades of 6.0, or consent of Department. Offered in alternate years. Intended for undergraduate students. Graduate students may not register for credit (see BIOCH 541).

### **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 203 and 205 with minimum grades of 6.0, or consent of Department. Offered in alternate years. 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) (first term, 3-0-0). Advanced course focussing on specific aspects of the regulation of lipid and lipoprotein metabolism. Topics include the transcriptional and post-transcriptional 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 203 and 205 with minimum grades of 6.0, or consent of Department. Offered in alternate years. Intended for undergraduate students. Graduate students may not register for credit (see BIOCH 555).

### **L BIOCH 460 Physical Biochemistry**

★3 (fi 6) (second term, 3-0-0). Survey of physical techniques used in the

characterization and structural determination of biological macromolecules. Topics include hydrodynamics, optical and magnetic resonance spectroscopies, diffraction techniques such as X-ray crystallography, and small angle neutron and X-ray scattering. Emphasis is on using these techniques in evaluating structure-function relationships by a discussion of representative macromolecular systems. Prerequisites: BIOCH 203 and 205 with minimum grades of 6.0, or consent of Department. Prerequisite or corequisite: CHEM 271 and 273; or consent of Department. Offered in alternate years. Intended for undergraduate students. Graduate students may not register for credit (see BIOCH 560).

### **BIOCH 498 Advanced Laboratory**

★3 (fi 6) (either term, 0-0-4). An advanced laboratory course for undergraduate students enrolled in Honors or Specialization Biochemistry who wish to engage in individual research. Enrolment is limited to students whose performance is exceptional (e.g., GPA of 7.5 or greater). Can be taken as a science elective but not as a substitute for required courses in Biochemistry. Prerequisites: BIOCH 401 and consent of Course Coordinator. Not to be taken by students with credit in former BIOCH 501.

### **BIOCH 499 Honors 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. Prerequisite: Students enrolled in this course will normally be in their graduating year in the Honors program in Biochemistry.

## Graduate Courses

### **BIOCH 510 Integration and Regulation of Metabolism**

★3 (fi 6) (second term, 3-0-0). Principles of metabolic regulation by hormones, intracellular signals, and protein modification. Biochemistry of cellular communication. Coordination of carbohydrate, lipid, nucleotide, and protein metabolism. Prerequisites: BIOCH 203 and 205 with minimum grades of 6.0, or consent of Department. Offered in alternate years. 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 determining protein structure. Principles of protein folding and dynamics. Enzyme mechanisms and ligand binding interactions. Prerequisites: BIOCH 203 and 205 with minimum grades of 6.0, or consent of Department. Offered in alternate years. 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 522 Advanced Nucleic Acids - Special Topics**

★3 (fi 6) (second term, 3-0-0). A detailed understanding of DNA structure, both electronic of the bases and conformational of the double helix. Special properties of DNA relevant to its biology (curvature, etc.). Triplexes and tetraplexes. Topology and supercoiling of DNA, topoisomerases, strategies for DNA replication. Chromosome structures, e.g., *E. coli* nucleoid. Aspects of nucleic acid chemistry, such as oligonucleotide synthesis and sequencing, DNA photochemistry and DNA damage by environmental agents and drugs, nucleic acid-protein interactions, enzymes involved in DNA metabolism and potential use of ribozymes and gene targeting technology. There will be a detailed examination of the mechanisms of DNA repair and the effects of genome instability. Prerequisites: BIOCH 203 and 205 with minimum grades of 7.0 or consent of Department, BIOCH 430 or 530. Offered in alternate years.

### **BIOCH 530 Biochemistry of Eukaryotic Gene Expression**

★3 (fi 6) (first term, 3-0-0). This course will consider 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 203 and 205 with minimum grades of 6.0, or consent of Department. Offered in alternate years. 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 203 and 205 with minimum grades of 6.0, or consent of Department. Offered in alternate years. 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 203 and 205 with minimum grades of 6.0, or consent of Department. Offered in alternate years. 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) (first term, 3-0-0). Advanced course focussing on specific aspects of the regulation of lipid and lipoprotein metabolism. Topics include transcriptional and post-transcriptional 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; assembly and dynamics of lipoproteins and biological membranes; genetic disruptions of lipid regulatory proteins such as cell surface receptors leading to human disease. Prerequisite: BIOCH 203 and 205 with minimum grades of 6.0, or consent of Department. Offered in alternate years. 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 560 Physical Biochemistry**

★3 (fi 6) (second term, 3-0-0). Survey of the physical techniques used in the characterization and structural determination of biological macromolecules. Topics include hydrodynamics, optical and magnetic resonance spectroscopies, diffraction techniques such as X-ray crystallography, and small angle neutron and X-ray scattering. Emphasis will be placed on the utility of these techniques in evaluating structure-function relationships by a discussion of representative macromolecular systems. Prerequisites: BIOCH 203 and 205 with minimum grades of 6.0, or consent of Department. Pre- or corequisites: CHEM 271 and 273, or consent of Department. Offered in alternate years. Lectures are the same as for BIOCH 460, 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 460.

**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. Offered in alternate years.

**BIOCH 650 Special Topics in Research on Lipids and Lipoproteins**

★2 (fi 4) (two term, 0-1s-0). This course is a journal club and discussion group addressing topics under the general heading of lipids and lipoprotein research. Specific talks range from biochemistry, genetics and microbiology to molecular biology and clinical aspects.

**BIOCH 655 Advances in Lipid and Lipoprotein Research**

★3 (fi 6) (second 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 671 Recent Advances**

★4 (fi 8) (two term, 0-2s-0). A seminar course on topics of current interest in Biochemistry. Note: Open to Graduate students in Biochemistry only.

**BIOCH 675 Magnetic Resonance in Biology and Medicine II**

★3 (fi 6) (second term, 3-0-0). The application of nuclear magnetic resonance in fields from biochemistry to medicine. Topics include studies of protein structure and function and enzyme mechanisms by NMR, and applications of in vivo NMR spectroscopy and NMR imaging. Designed for advanced honors and graduate students interested in the application of NMR to biological systems. Prerequisite: ASM 575 or consent of Instructor. Offered in alternate years.

**201.19 Biochimie, BIOCM**

Faculté Saint-Jean

**Cours de 1er cycle****BIOCM 203 Introduction à la biochimie I**

★3 (fi 6) (premier semestre, 3-0-0). Structure et chimie de la cellule; structure et fonction des protéines; cinétique enzymatique; chimie des glucides, métabolisme intermédiaire. Prérequis: CHIM 101; CHIM 161 ou 261; et CHIM 163 ou 263. Notes: (1) les étudiants ayant obtenu une note inférieure à 6.0 dans un de ces cours devront obtenir la permission de l'instructeur avant de s'inscrire. (2) Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour BIOCH 201 ou BIOCH 220.

**BIOCM 205 Introduction à la biochimie II**

★3 (fi 6) (deuxième semestre, 3-0-0). Chimie et métabolisme des lipides, acides aminés et nucléotides; structure et assemblage des membranes; biologie moléculaire des acides nucléiques. Prérequis: BIOCH 203. Note: ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour BIOCH 201.

**201.20 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, 3-0-3). La cellule étant à la base de toute fonction vitale, ce cours offre une introduction à la structure et au fonctionnement de la cellule. Les principaux sujets étudiés comprendront l'origine de la vie, le développement des cellules procaryotes et eucaryotes, la bioénergétique, les fonctions biochimiques à l'intérieur de la cellule et la communication entre les cellules. Le contrôle génétique des activités cellulaires est examiné au moyen des protocoles de l'analyse génétique moléculaire et de leurs applications au génie génétique et à la biotechnologie. Note: les étudiants qui ont des crédits pour les deux cours GENEQ 197 et MICRB 193 ne peuvent obtenir des crédits pour BIOLE 107. Prérequis: Biologie 30 et Chimie 30.

**BIOLE 108 Les organismes et leur environnement**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-3). Une introduction aux divers organismes de cette planète et comment ils ont été affectés par leur environnement et comment l'environnement est présentement le produit de l'activité d'organismes. Sera étudié également comment l'évolution a produit, sur une longue période de temps, les principaux groupes d'organismes et comment les origines de l'évolution ont affecté leur classification. Les principes sous-jacents à notre connaissance des principales lignées seront étudiés en se servant d'exemples de bactéries, de champignons, de protistes, de plantes et d'animaux. Une description du rôle des organismes dans les principaux écosystèmes conduira à une estimation de la stabilité de ces systèmes et de l'impact humain sur eux. Note: les étudiants qui ont des crédits pour les cours BOTQ 199 et ZOOLE 120 ne peuvent obtenir des crédits pour BIOLE 108.

**BIOLE 207 La génétique moléculaire et l'hérédité**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-3). 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. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits en GENEQ 197. Prérequis: 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. L'emphase dans les laboratoires 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. Prérequis: BIOLE 108.

#### **BIOLE 315 Histoire et théorie de la biologie**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Aperçu des découvertes biologiques des temps les plus reculés jusqu'à maintenant et des principales idées nées des sciences de la vie ou les influençant, et ce par rapport aux événements sociaux, historiques et culturels. Recommandé aux étudiants qui se spécialisent dans les sciences biologiques mais accessible à tous les étudiants qui s'intéressent à l'histoire de la science et de son importance dans le développement de la culture. Prérequis: Un cours de niveau 200 en science biologique.

#### **BIOLE 490 Etude 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. Prérequis: ★6 en sciences biologiques de niveau 300 et l'accord du Vice-doyen aux affaires académiques.

## 201.21 Biology (Biological Sciences), BIOL

Department of Biological Sciences  
Faculty of Science

**Note:** See the following sections for listings of other Biological Sciences courses: Botany (BOT); Entomology (ENT); Genetics (GENET); Microbiology (MICRB); Zoology (ZOO).

### Undergraduate Courses

#### **BIOL 107 Introduction to Cell Biology**

★3 (fi 6) (either term, 3-0-3). This course provides an introduction to cell structure and function. Major topics include the origin of life, development of prokaryotic and eukaryotic cell lineages, energy conversions, compartmentation of biochemical functions within a cell and communication from cell to cell. Genetic control of cell activities is examined through methods of molecular genetic analysis and their application in genetic engineering and biotechnology. Prerequisites: Biology 30 and Chemistry 30. Note: BIOL 107 and 108 can be taken in either order.

#### **BIOL 108 Organisms in Their Environment**

★3 (fi 6) (either term, 3-0-3). Introduction to how the organisms on this planet have been affected by their environment and how the current environment is the product of the activities of organisms. Also examines how evolution has operated to produce the major groups of organisms and how evolutionary origins are reflected in their classification. The principles that underlie our understanding of the major lineages is discussed using examples from bacteria, fungi, protists, animals, and plants. A description of the involvement of organisms in major ecosystem processes leads to an evaluation of the stability of those systems and of human impact on the processes. Prerequisite: Biology 30. Note: BIOL 107 and 108 can be taken in either order.

#### **BIOL 201 Cellular Biology**

★3 (fi 6) (first term, 3-0-0). The ultrastructure and metabolism of cells. Energy in biological systems; photosynthesis; cellular respiration; contractility; cell growth and replication. Prerequisite: BIOL 107. Prerequisite or corequisite: CHEM 161 or 163.

#### **BIOL 207 Molecular Genetics and Heredity**

★3 (fi 6) (either term, 3-0-3). 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. Note: Students may not obtain credit for both BIOL 207 and GENET 197. Prerequisite: BIOL 107.

#### **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. Students may not obtain credit for both BIOL 208 and BOT 130 or ZOO 231. Prerequisite: ZOO 120, BOT 199, or BIOL 108.

#### **BIOL 260 Humanity and the Biosphere**

★3 (fi 6) (either term, 3-0-0). A consideration of the place of people in the biosphere and of the biological bases of environmental problems including

population, pollution and consideration of renewable and aesthetic resources. Note: Credit may not be obtained for both BIOL 260 and ZOO 260. Prerequisite: One full year of university-level Biology. Credit may be obtained in only one of ZOO 260 and BIOL 260.

#### **BIOL 301 Experimental Animal Models**

★3 (fi 6) (second term, 3-0-3). Directed to senior level (third- and fourth-year) undergraduate students with a background in vertebrate biology and an interest in animal based research. Assists the students in selecting appropriate experimental animal models for specific types of research. Discussion includes the advantages and limitations of animal models, and the use of alternative and/or complementary non-animal models. Ethics of animal use is emphasized throughout the course. Students are also informed of the regulations and legislation governing the use of animals in Canada. Prerequisite: ZOO 224 and 225. Credit may be obtained in only one of LB AN 301 and BIOL 301.

#### **BIOL 315 Biology: An Historical Perspective**

★3 (fi 6) (either term, 3-0-0). Outline of biological discovery from preclassical times to the early 20th century, considered in relation to other social, historical and cultural developments. Intended for senior students in biological sciences. Prerequisite: At least one 200-level Biological Science course.

#### **BIOL 321 Mechanisms of Evolution**

★3 (fi 6) (first term, 3-0-0). Discusses the major features of the evolutionary process, including the fossil record, basic population genetics, variation, natural selection, adaptation, and speciation. Prerequisites: BIOL 108, BIOL 207. Students may not obtain credit for both ZOO 321 and BIOL 321.

#### **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 or 120; STAT 151.

#### **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. Prerequisites: BIOL 108 and a 200-level Biological Sciences course. Students may not obtain credit for BIOL 335 if credit has already been given for either ZOO 335 or BIOL 220.

#### **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 366 Boreal Ecology**

★3 (fi 6) (second term, 3-0-0). Terrestrial and aquatic ecosystems of the north, emphasizing special features of the environment and biotic responses. Prerequisite: ZOO 231 or BIOL 208.

#### **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. Students may not obtain credit for BIOL 380 if credit has already been given for GENET 280.

#### **BIOL 381 Pollution Biology**

★3 (fi 6) (second term, 3-0-0). The ecological impact of natural and anthropogenic pollutants on aquatic and terrestrial ecosystems. The major groups of environmental pollutants and the phenomenon of long-range transport of pollutants are used as an introduction to several important global pollution problems. Lectures deal specifically with acid precipitation, metals in the environment, stratospheric ozone depletion, and the greenhouse effect, exploring effects on plants at the biochemical, physiological, ecological, and ecosystem levels. This background is then used to discuss issues such as forest decline, multiple plant stresses, biomagnification, global diversity, economics and politics of pollution control, progress toward pollution control, and progress toward pollution abatement. Prerequisite: A 200-level Biological Sciences course. Credit may not be obtained for both BIOL 381 and BOT 381.

#### **BIOL 400 Industrial Internship Practicum**

★3 (fi 6) (first 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

1 to 9 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 942, or 943.

#### **BIOL 420 Molecular Systematics**

★3 (*fi 6*) (second term, 3-0-3). Laboratory techniques and the application and interpretation of protein and DNA variation to problems in the evolutionary biology of plants and animals: Phylogeny reconstruction and vicariance biogeography (emphasis on problems unique to molecular data), paternity analysis, direction and extent of hybridization, various aspects of population structure (e.g., inbreeding, population subdivision). Prerequisites: BIOCH 203 or 220. BIOL 321 or BIOL 380 strongly recommended. Offered in alternate years.

#### **BIOL 430 Experimental Biology**

★3 (*fi 6*) (first 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.

#### **BIOL 433 Mutualistic Symbiosis**

★3 (*fi 6*) (second term, 3-0-3). Examination of the variety of ways in which organisms interact to their mutual benefit. Examples are taken from interactions among plants, animals, and microbes, from systems in marine, freshwater and terrestrial habitats, and from obligate and facultative associations. Prerequisites: BIOL 331 or ZOO 331 or 332 or 371. Offered in alternate years.

#### **BIOL 435 Evolutionary Biogeography**

★3 (*fi 6*) (second term, 3-0-0). Patterns of geographic distributions of organisms and their interpretation with respect to the evolution of floras and faunas. Prerequisite: BIOL 321. Credit may not be obtained for both BIOL 435 and BOT 435.

#### **BIOL 445 Cell Physiology**

★3 (*fi 6*) (second term, 3-0-0). Survey of literature dealing with current advances in selected topics in cell biology. Designed for fourth-year students in biological sciences and graduate students. Prerequisites: ZOO 242 or BIOL 201, and BIOCH 203 and 205, and a 300-level Biological Sciences course.

#### **BIOL 464 Limnology**

★3 (*fi 6*) (first 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 and ★6 in University level Chemistry. This course requires the payment of additional miscellaneous fees. See §22.2.3 for details. Credit may be obtained for only one of ZOO 464 and BIOL 464.

#### **BIOL 467 Conservation Biology**

★3 (*fi 6*) (first term, 3-0-3). Principles and concepts involved in conservation and management of species and ecosystems. Prerequisite: ZOO 331, 332, or ENCS 376. Credit cannot be obtained for both BIOL 467 by students who already have credit for ZOO 467 or ENCS 464.

#### **BIOL 468 Problems in Conservation Biology**

★3 (*fi 6*) (second term, 3-0-0). Seminar and reading course on current problems in conservation biology. Prerequisite: ZOO 467 or BIOL 467 and consent of Department. Credit cannot be obtained for BIOL 468 by students who already have credit for ZOO 468. Offered in alternate years.

#### **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. Prerequisite: A 300-level Biological Sciences course and consent of the Department.

#### **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. Credit may be obtained more than once. Prerequisites: A 300-level Biological Sciences course and consent of the Department. Note: it is recommended that students in Specialization in Biological Science take BIOL 498 or 499.

#### **BIOL 499 Research Project**

★6 (*fi 12*) (two term, 0-0-6). Directed research in laboratory of an assigned member of the Biological Sciences Department. Project would normally continue through Fall and Winter, and would culminate in a written report. Successful completion requires an oral presentation and a written report on the research project. Prerequisites: A 300-level Biological Sciences course and consent of the Department. Note: students in Honors in Biological Science 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 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: BIOCH 510, 520, 530, 540, 541, 550, 555, 560; CHEM 361, 363, 461; CELL 300, 301; INT D 371, 372, 421, 452, 455, 464, 543, 544, 545, 551; MA SC 400, 401, 402, 410, 412, 420, 425, 430, 437, 440, 445, 450, 454, 470, 480; MMI 350, 405, 415, 516, 520; NEURO 472, 503; NU FS 363; PALEO 318, 319; PHARM 601.

#### **BIOL 520 Current Problems in Molecular Evolutionary Biology**

★3 (*fi 6*) (second term, 3-0-0). Discussions of current issues relating to molecular evolutionary biology and systematics of plants and animals. Discussions emphasize both methodology and interpretation, and cover a wide range of topics related to using micro- and macromolecular markers. Prerequisite: BIOL 420 or consent of Department. Offered in alternate years.

#### **BIOL 564 Current Problems in Animal Ecology**

★3 (*fi 6*) (either term, 0-3s-0). Seminar and reading course on current problems in ecology of terrestrial animals. Prerequisite: consent of Department.

#### **BIOL 565 Current Problems in Aquatic Systems**

★3 (*fi 6*) (either term, 0-3s-0). Seminar and reading course on current problems in aquatic organisms and processes. Prerequisite: consent of Department. Credit may only be obtained in one of BIOL 665 and 565.

#### **BIOL 566 Current Problems in Plant Ecology**

★3 (*fi 6*) (either term, 0-3s-0). Seminar and reading course on current problems in the ecology of terrestrial plants. Prerequisite: A 300-level Biological Science course and consent of Department. Credit may be obtained in only one of BOT 530 and 566.

#### **BIOL 585 Advanced Techniques in Biological Microscopy**

★3 (*fi 6*) (second term, 0-0-6). Prerequisite: a university course in cell biology; BOT 419, BIOL 445, developmental biology or a course in microbiology strongly recommended. Techniques in transmission electron confocal and other types of microscopy used in modern biology, including image processing and analysis. Note: Enrolment strictly controlled due to limited facilities; consent of Instructor required.

#### **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 may only be obtained in one of ZOO 601 and BIOL 601.

#### **BIOL 602 Advanced Aquatic Ecology**

★3 (*fi 6*) (either term, 0-3s-0). Theoretical and empirical foundations and practical applications of classical and contemporary aquatic research. Credit may be obtained in only one of ZOO 605 and BIOL 602.

#### **BIOL 603 Advanced Ecology**

★3 (*fi 6*) (either term, 3-1s-0). Series of lectures by Faculty members concerning their research and its relationship to broader ecological questions, and student presentations and discussions on related topics. Credit may only be obtained for one of BIOL 663 and 603.

#### **BIOL 606 Current Problems in Systematics and Evolution**

★3 (*fi 6*) (either term, 0-2s-0). Presentation and discussion of recent research in systematics, evolutionary biology and biodiversity. Credit may be obtained more than once. Prerequisite: consent of Instructors for students not registered in the systematics and evolution program.

#### **BIOL 620 Tutorial in Research and Communication**

★3 (*fi 6*) (either term, 1-3s-0). Designed for first-year graduate students in the Department of Biological Sciences emphasizing the application of scientific methodology and good scientific communication. Includes a series of workshops and activities to develop skills useful to graduate students in all areas of biology.

#### **BIOL 631 Seminar in Ecology**

★1 (*fi 2*) (either term, 0-2s-0). Credit may be obtained more than once.

#### **BIOL 642 Seminar in Physiology and Cell Developmental Biology**

★1 (*fi 2*) (either term, 0-2s-0). Credit may be obtained more than once.

#### **BIOL 664 Seminar in Aquatic Ecology**

★1 (*fi 2*) (either term, 0-2s-0). Credit may be obtained more than once.

## 201.22 Biomedical Engineering, BME

Department of Biomedical Engineering  
Faculty of Medicine and Dentistry

## Undergraduate Courses

### **01 BME 210 Elementary Human Anatomy and Physiology**

★3 (*fi 6*) (first term, 3-0-0). Introduction to basic anatomy and physiology of the human body for engineers. The objective is to present the various levels of structural organization of the body from chemical, through cellular and tissue

organization to whole body structure and maintenance. The role of physical principles and phenomena as they are known to exist and apply to living systems is highlighted in engineering terms in preparation for BME 310. Intended for undergraduate students of the Engineering program. Students from other faculties must obtain the consent of the Department of Biomedical Engineering.

#### **Q BME 310 Biological Systems Modeling and Analysis**

★3 (fi 6) (second term, 3-0-0). Application of the tools of mathematical analysis and modeling to biological systems with emphasis on engineering concepts such as feedback, stability, signal transmission, energy transduction and network theory. Topics include electrical properties of excitable tissue, particularly nerve and muscle, control of human posture and locomotion, homeostasis, including regulation of body temperature and blood pressure, biofluid mechanics, particularly pressure-flow relations in heart action and circulation and respiration with emphasis on work of breathing, lung mechanics and gas exchange. Intended for undergraduate students of the Engineering program. Students from other faculties must obtain the consent of the Department of Biomedical Engineering.

#### **Q 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 are also discussed in relation to future prospects of each method.

#### **Q BME 553 Rehabilitation Engineering: Orthotics and Assist Locomotion**

★3 (fi 6) (second term, 3-0-3/2). Interdisciplinary course introducing recent advances in modern exoskeletal bracing and neuroprosthetic systems designed to assist individuals with physical disabilities (e.g., spinal cord injury) to stand and walk. Relevant aspects of biomechanics, gait analysis, control systems, materials and clinical applications is emphasized. Students also have the opportunity to participate in clinical case demonstrations and gain experience in human movement measurement and analysis techniques. Prerequisite: consent of Instructor.

## Graduate Courses

#### **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 555 Anatomy and Physiology for Engineers**

★3 (fi 6) (second term, 3-0-0). A broad view of human anatomy and physiology, particularly as it pertains to biomedical engineering and instrumentation. Certain aspects of human pathology are discussed to emphasize the range of adaptations possible in biological structure and function. Prerequisite: consent of Department. Available to students in a biomedical engineering program only except by special permission.

#### **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 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 or 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.

#### **BME 675 Magnetic Resonance in Biology and Medicine I**

★3 (fi 6) (first term, 3-0-0). Physical principles behind the application of nuclear magnetic resonance spectroscopy in fields from biochemistry to medicine. Topics

include Fourier transform NMR, multipulse techniques, two-dimensional NMR, relaxation theory, in vivo spectroscopy, NMR imaging. Designed for advanced honors and graduate students interested in the application of NMR to biological systems. Intended to be followed by BIOCH 575. Offered in alternate years. Prerequisite: consent of Instructor.

#### **BME 679 Advanced Topics in Medical Physics**

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

## 201.23 Bioresource Engineering, BIOEN

Department of Agricultural, Food and Nutritional Science  
Faculty of Agriculture, Forestry, and Home Economics

**Note:** See Agricultural Food and Nutritional Science (AFNS), Animal Science (AN SC), Nutrition (NUTR), Nutrition and Food Sciences (NU FS), and Plant Science (PL SC) listings for related courses.

## Undergraduate Courses

#### **Q BIOEN 200 Introduction to Bioresource Engineering**

★3 (fi 6) (either term, 3-1s-0). Introduction to engineering methods and the interface between biological and engineering systems in the bioresource industries. Examples of synthesis, analysis and implementation of engineering systems in these industries. Prerequisite: MATH 113 or 114.

## 201.24 Botany (Biological Sciences), BOT

Department of Biological Sciences  
Faculty of Science

#### **Notes**

- (1) See the following sections for listings of other Biological Sciences courses: Biology (BIOL); Entomology (ENT); Genetics (GENET); Microbiology (MICR); Zoology (ZOO).
- (2) See also INT D 421 for a course offered by more than one department or Faculty and which may be taken as options or as a course in this discipline.
- (3) See INT D 455 and 551 taught by the Department of Biological Sciences and AFNS.

## Undergraduate Courses

#### **BOT 201 Simple Eukaryotes: Algae, Fungi and Lichens**

★3 (fi 6) (first term, 3-0-3). Review of diverse phyla encompassed by the traditional terms fungi and algae, ultrastructure, biochemistry and DNA analyses, and the interpretation of evolutionary relationships; the role of selected examples in terrestrial, aquatic and marine ecosystems. Laboratories permit the systematic study of most phyla and the partial characterization of communities of these organisms in several different habitats. Prerequisite: BIOL 108.

#### **BOT 204 Introduction to Plant Resources**

★3 (fi 6) (first term, 3-0-3). Identification of vascular and non-vascular plants (including some fungi) and quantitative assessment of vegetation. Includes population and community sampling techniques, community classification, assessment of diversity, and quantification of range and timber resources. Prerequisites: BIOL 108 plus ★3 in Life Sciences. Note: ENCS 204 and BOT 204 cannot both be taken for credit.

#### **BOT 210 The Plant Kingdom: Vascular Plants**

★3 (fi 6) (second term, 3-0-3). Comparative survey of vascular plants focusing on their morphology, classification and phylogeny. Emphasis on living plant groups with some paleobotanical evidence presented. Prerequisite: BIOL 108.

#### **BOT 240 Whole Plant Physiology**

★3 (fi 6) (first term, 3-0-3). Introductory general course on water and energy relations, evapotranspiration, mineral nutrition, membrane transport, ascent of sap, translocation, net assimilation, growth, development, hormone action, and stress. Prerequisites: BIOL 107; CHEM 101 or 161 or 163.

#### **BOT 250 Plant Cell Biology**

★3 (fi 6) (second 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: BIOL 107; CHEM 161 and 163.

#### **BOT 302 Biology of Algae**

★3 (fi 6) (first term, 3-0-3). Origins and evolution of algae; comparative morphology, life histories and taxonomy; aspects of ecology and physiology; adaptations to different habitats and environments; algae and economic aspects. Prerequisite: BOT 201. Offered in odd-numbered years.

**BOT 303 Introductory Plant Developmental Biology**

★3 (*fi 6*) (second term, 3-0-3). This course integrates the structural and molecular aspects of fertilization and seed development, germination, and cell and tissue differentiation using conifer and flowering plant examples. Some selected examples from non-seed plants are used where appropriate. Prerequisites: BOT 210 or 240, BIOL 201 recommended. Credit may be obtained in only one of BOT 202 and 303.

**BOT 304 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 five weeks of term. Requires the payment of additional fees (see §22.2.3). Prerequisites: BIOL 108 and any 200-level Biology course.

**BOT 305 Biology of Bryophytes**

★3 (*fi 6*) (second term, 3-0-3). Identification, classification and morphology of mosses, hepatics, and hornworts. Special emphasis on phylogeny and ecology of mosses. Lectures include botanical nomenclature and cladistics as applied to bryophytes, phytogeography, and origins of land plants. The laboratories stress the comparative structure of bryophyte families and genera. Prerequisite: BOT 201. Offered in odd-numbered years.

**BOT 306 Biology of the Fungi**

★3 (*fi 6*) (second term, 3-0-3). Systematic review of Kingdom Fungi with emphasis on the ecological and economic importance of these organisms. Special emphasis on the practical aspects of isolating and identifying the fungi and interpreting their role in different environments. Coevolution of the fungi with plants, animals, and other microbes is discussed. Prerequisites: BIOL 108 and a 200-level Biological Science course. BOT 201 recommended.

**BOT 309 Developmental Plant Anatomy**

★3 (*fi 6*) (first term, 3-0-3). Developmental approach to the structure of seed plants. Development and structure of cell walls, apical and lateral meristems, all major tissues and organs, floral, wood anatomy, flowering plant reproductive biology, and embryology will be included. Prerequisite: BOT 210 or BOT 240.

**BOT 320 Flowering Plants of the World**

★3 (*fi 6*) (first term, 3-0-3). Emphasizes evolution and classification of flowering plants, the angiosperms. Discusses the diversity of flowering plants on a worldwide basis and focuses on relationships of the major flowering plant families. Also, discussions of systems of classification, nomenclature, field-collecting techniques and preparation of specimens, and family characteristics. Laboratories deal with practical aspects of flowering plant classification and identification. Prerequisite: BOT 210. Credit may be obtained in only one of BOT 220 and BOT 320.

**BOT 332 Plant Community Ecology**

★3 (*fi 6*) (first term, 3-0-3). Major topics in the discussion of plant communities include vegetation, species interactions, ecological succession, the spatial structure of plant communities, classification and ordination of communities, vegetation mapping. The laboratory component includes field trips. Prerequisites: BIOL 208; STAT 151; any one of MATH 113, 115 or 120. This course requires the payment of additional fees (see § 22.2.3). Credit may not be given for both BOT 332 and BOT 230.

**BOT 333 The Ecology of Aquatic and Peatland Plants**

★3 (*fi 6*) (second term, 3-0-3). Introduction to the ecology of freshwater, marine and peatland plants, communities, and ecosystems. Major topics are physical and chemical cycles; habitats, niche concepts, and communities; the flora and its adaptations to the benthos, plankton, and wetland habitats; dispersal and transport; succession including an introduction to paleolimnology; and paleostratigraphy of peatlands, including their evolution; growth and decline of populations, productivity; eutrophication, acidification; classification of peatlands; distribution of wetlands relative to climate; geological and hydrological factors. Prerequisites: BIOL 108 and a 200-level Biological or Earth Sciences course.

**BOT 380 Drug Plants of the World**

★3 (*fi 6*) (second term, 3-0-0). Survey of the biology and historical uses of important drug-producing plants. Evaluation of the chemistry of biologically active compounds from poisonous, allergenic, analgesic, and hallucinogenic plants, and the current uses of such plant products in modern scientific research. Use of plant biotechnology to develop drug-producing plants. Prerequisite: A 200-level Biological Sciences course. BOT 210 or BIOL 108 recommended.

**BOT 382 Plant Biotechnology**

★3 (*fi 6*) (first term, 3-0-0). The techniques used in modern plant biotechnology and the way this technology is being used to modify and improve economically important plant species. Topics include cloning of plant genes; plant, gene vectors; tissue culture clonal propagation. Prerequisite: A 200-level Biological Sciences course. BIOL 207 recommended.

**BOT 383 Biology of Economic Plants**

★3 (*fi 6*) (first term, 3-0-0). The biology and utilization of economically important vascular and nonvascular plants emphasizing relevant morphology, physiology, distribution, and history of use. Prerequisites: BIOL 108 and a 200-level Biological Sciences course. Offered in even-numbered years.

**BOT 384 Global Change and Ecosystems**

★3 (*fi 6*) (first term, 3-0-0). Ecological impact of climate change and large-scale human activities on terrestrial and aquatic ecosystems. Topics include impacts of climatic warming, desertification, water diversion projects, and invasion of exotic species. Emphasis on community and ecosystem-level impacts in natural ecosystems, although societal implications of ecological alterations are discussed. Some consideration of the way society assesses impacts and places value on environmental benefits is used to evaluate environmental options, trade-offs, and solutions. Prerequisite: BIOL 208 or equivalent. Offered in even-numbered years.

**BOT 409 Advanced Structural Botany**

★3 (*fi 6*) (second term, 3-0-0). Lecture/seminar course dealing with advanced topics in plant structure and development. Prerequisite: BOT 309. Offered in even-numbered years.

**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. Offered in even-numbered years.

**BOT 419 Plant Microtechnique**

★3 (*fi 6*) (second term, 3-0-3). Theory and practice of preparing plant cells and tissues for observation with light and scanning electron microscopy. Fixation, dehydration, embedding, sectioning, standard staining procedures, some histochemistry, use of light microscope, introduction to modern embedment media. Prerequisite: BOT 309. Offered in odd-numbered years.

**BOT 431 Physiological Ecology**

★3 (*fi 6*) (first term, 3-0-3). Application of ecophysiological theory and practice of the study of plant responses to increasing carbon dioxide levels and increased irradiance of ultraviolet-B light. Experimental work includes demonstrations and individual projects making use of the phytotron facility. Seminars involve the discussion of significant research papers in the discipline. Prerequisites: A 200-level course in Plant Physiology and a senior course in Ecology. Offered in odd-numbered years.

**BOT 433 Lake and Peatland Development**

★3 (*fi 6*) (first term, 3-0-3). Introduction to field and laboratory techniques in studying lake and peatland histories along with a critical evaluation of parameters used to make interpretations about their history. Parameters discussed include physical, chemical (clastic, organic and fossil pigments), and biotic (bryophytes, pollen, seeds, diatoms, chrysophytes). Both natural development and modified systems are discussed. Prerequisites: BOT 201 and a 300-level Biological or Earth Sciences course. Offered in even-numbered years.

**BOT 442 The Mineral Nutrition of Plants**

★3 (*fi 6*) (second term, 3-0-0). Acquisition and utilization of mineral nutrients by higher plants. Specific topics include effect of plant roots on the solubility and availability of soil minerals, the role of roots, root hairs, root nodules, and mycorrhiza in mineral acquisition, mechanisms of ion transport across the plasma membrane, functions of macronutrients, micronutrients, and the beneficial elements, chemical composition of plant tissues, and response of plants to mineral deficiencies and toxicities. Prerequisites: BOT 240 and a 300-level Botany course (BOT 309 recommended). Offered in odd-numbered years.

**Graduate Courses****Notes**

- (1) All 300- and 400-level courses in the Department of Biological Sciences may be taken for credit 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, 540, 541, 550, 555, 560; CHEM 361, 363, 461; CELL 300, 301; INT D 371, 372, 421, 452, 455, 464, 543, 544, 545, 551; MA SC 400, 401, 402, 410, 412, 420, 425, 430, 437, 440, 445, 450, 454, 470, 480; MMI 350, 405, 415, 516, 520; NEURO 472, 503; NU FS 363; PALEO 318, 319; PHARM 601.

**BOT 505 Biosystematics of the Mosses**

★3 (*fi 6*) (either term, 3-0-0). Lectures, discussions and surveys of the literature of approaches and techniques for studying the phylogeny of mosses. The course includes a historical review of bryology and invited lectures on such topics as phylogenetics, nomenclature, phonetics, biometric analyses of population, experimental taxonomy and herbarium practices. Offered in even-numbered years.

**BOT 506 Advanced Mycology**

★3 (*fi 6*) (second term, 3-0-0). 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 odd-numbered 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 odd-numbered years.

**BOT 540 Nutrient Partitioning in Plants**

★3 (fi 6) (first term, 3-0-0). Long distance transport in plants through phloem and xylem and the regulation of nutrient partitioning is surveyed. Emphasis on transport of carbon in source and sink tissues. The role of environmental and nutritional factors in the control of partitioning is discussed. Offered in even-numbered years.

**BOT 543 Plant Stress**

★3 (fi 6) (second term, 3-0-0). Lecture seminar course addressing current topics dealing with the response of plants to environmental stresses. Focus on stress response at the whole plant, cellular and molecular level. Metal stress arising from agricultural practices, industrial activity, waste disposal, and urbanization serves as a model for addressing other plant stresses including wounding, temperature, and water stress. Topics include concept of toxicity thresholds, regulation of stress related genes, stress interactions, the physiology and biochemistry of tolerance and toxicity, evolution of tolerant ecotypes, and breeding for stress tolerance in crop cultivars. Offered in even-numbered years.

**201.25 Business, BUS**

Department of Organizational Analysis  
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) (either term, 3-0-0). Introduces the structure of Canadian Business in the global context. Emphasis on the examination of a number of business sectors and to various problems encountered by organizations operating in these sectors. Potential solutions are discussed. Guest speakers from industry and government discuss their own organizations and the current issues they face.

**BUS 488 Selected Topics in Business**

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

**Graduate Courses****BUS 515 Fundamentals of Technological Innovation and Commercialization**

★1.5 (fi 3) (either term, 18 hours). The nature of technological innovation within different industrial settings. Early sessions focus on theories of technological discontinuities and patterns of industry transformation. Later sessions examine the different stages of technology commercialization in selected industries. Offered in a six-week period.

**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) (either 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 615 Biotechnology Law**

★2 (fi 4) (either term, 0-2s-0). An introduction to the major legal and related issues confronting the growth of the health technology industries. Students are exposed to (1) regulatory requirements for commercial production of and the protection afforded to the creation of medical devices, products and compounds, and (2) issues of experimentation and ethical aspects of research. Offered in conjunction with the Faculty of Law.

**BUS 686 Selected Topics in Business**

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

**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) (first term, 3-0-0). Topics will vary from year to year. Restricted to Executive MBA students only.

**BUS 875 Special Topics**

★3 (fi 32) (second 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).

**201.26 Business Economics, BUEC**

Department of Marketing, Business Economics, and Law  
Faculty of Business

The following table lists courses renumbered effective 1997/98:

Old	New	Old	New
MANEC 301	BUEC 301	MANEC 466	BUEC 466
MANEC 379	BUEC 379	MANEC 470	BUEC 470
MANEC 414	BUEC 414	MANEC 471	BUEC 471
MANEC 444	BUEC 444	MANEC 484	BUEC 484
MANEC 445	BUEC 445	MANEC 488	BUEC 488
MANEC 454	BUEC 454	MANEC 495	BUEC 495

**Undergraduate Courses****BUEC 301 Microeconomics for Canadian Business Management**

★3 (fi 6) (either term, 3-0-0). Theories of choice as applied to consumer behavior and business decisions, production and price determination in alternative market forms; interrelatedness of firm decisions and of market outcomes, the impact of uncertainty. Prerequisites: ECON 101/102, MATH 113 or equivalent. Students may receive credit for only one of ECON 281, 383, or BUEC 301.

**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. Students with previous credit in ECON 281 must receive Departmental approval before registering in BUEC 311.

**BUEC 379 Government and Business**

★3 (fi 6) (either term, 3-0-0). 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 on the motivation, behavior patterns, and dynamics of the interaction of different stakeholder groups, policy makers, and administrators. 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 444 International Business**

★3 (fi 6) (either term, 3-0-0). Problems and opportunities arising when a firm operates in more than one country: the choice between operating abroad, export and licensing, nature and causes of the emergence of new capital markets, international institutions facilitating export finance, commodity price stabilization programmes, implications of commercial, tax and integration policy for business decisions, aspects of international management such as hedging of foreign exchange risk, transfer pricing and choice of optimal capital structure.

**BUEC 445 Competitive Strategies in the International Business Environment**

★3 (fi 6) (either term, 3-0-0). The design and implementation process of competitive strategies by firms with either multi-country or global operations. Emphasis is placed on competitive strategy frameworks, changing patterns of international competition, levels of analysis of international competition, and formulation and implementation of international competitive strategies. The material is illustrated by means of special case studies of Canadian firms. Prerequisite: BUEC 311.

**BUEC 454 Real Estate Management**

★3 (fi 6) (either term, 3-0-0). Real estate markets; real estate law; real estate economics and location; taxation of real estate; marketing, property management;

development; mortgage lending, real estate investment, brokerage, and regulation. A variety of learning opportunities are provided to students including participation in a real estate development simulation, presentations by speakers from industry, applied student research on one of the topic areas, field assignment, and/or field trip. Prerequisite: BUEC 311.

#### **BUEC 466 Taxation in Theory and Practice**

★3 (fi 6) (either term, 3-0-0). Examination of the Canadian tax structure from economic, legal and administrative points view. BCom degree credit will not be granted for both BUEC 466 and ECON 353.

#### **BUEC 470 Cultural Industries in a Global Economy**

★3 (fi 6) (either term, 3-0-0). International competition in selected cultural and entertainment industries, the effects of new technologies on competition, US competitive advantage and dominance of trade. Canadian public policy, and competitive strategy responses to this dominance. Prerequisite: BUEC 311 or consent of Instructor.

#### **BUEC 484 Economic Problems**

★3 (fi 6) (either term, 3-0-0). Current economic problems in business.

#### **BUEC 488 Selected Topics in Business Economics**

★3 (fi 6) (either term, 3-0-0). Prerequisite: BUEC 311, ECON 281, or consent of Department.

#### **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 501 Microeconomics for Managers**

★1.5 (fi 3) (either term, 18 hours). This course explains actual decision making in economic terms using demand and supply and relying on the concepts of substitutes and opportunity cost. The importance of marginality to decisions making is emphasized. Offered in a six-week period. Credit will not be provided for both MANEC 501 and BUEC 501.

#### **BUEC 511 Economic Structure of Government and Business**

★1.5 (fi 3) (either term, 18 hours). This course deals with two aspects of economic structure. First, the structure of real world markets is explained using the theories of competition and monopoly in which the meaning of profit plays a central role. Second, the structure of the relationship between government and business is examined in terms of the public choice and public interest theories of government decision making. The impact of interest groups is viewed through the theory of rent seeking. Offered in a six-week period. Prerequisites: BUEC 501 or MANEC 501. Credit will not be given for both MANEC 511 and BUEC 511.

#### **BUEC 512 Macroeconomics for Managers**

★1.5 (fi 3) (either term, 18 hours). Measuring macroeconomic variables, sources of economic growth, business cycles, interest rates, exchange rates, government debt, and other topics. Offered in a six-week period. Prerequisite: BUEC 501 or MANEC 501. Credit will not be given for both MANEC 512 and BUEC 512.

#### **BUEC 541 The International Business Environment**

★1.5 (fi 3) (either term, 18 hours). The economic, political, and cultural forces shaping the international business environment. The course assesses Canada's position in the world economy, introduces the forms of international business, explains the pattern of international trade in goods and services, and explores the motives for foreign direct investment. The course discusses and evaluates various government policies to influence international trade and investment and the nature of various international organizations. Offered in a six-week period. Prerequisites: BUEC 501 or MANEC 511 and BUEC 512 or MANEC 512. Credit will not be given for both MANEC 541 and BUEC 541.

#### **BUEC 560 Energy Technology and Institutions**

★1.5 (fi 3) (either term, 18 hours). An introduction to the physical and institutional realities of the energy sector. Topics include production, distribution, and marketing issues related to oil and gas and electricity. Canadian public policy processes and regulatory issues relating to the energy sector are also addressed. Offered in a six-week period.

#### **BUEC 561 Natural Resource Economics**

★1.5 (fi 3) (either term, 18 hours). An introduction to the economic theory of renewable and non-renewable resources. Topics include resource supply and competitive market equilibrium, taxation of natural resource rents, and natural resource pricing. The role of resources and macroeconomy is explored using

simple competitive models that consider varying resource grades, uncertainty, and technological change. Offered in a six-week period.

#### **BUEC 562 Environmental Economics**

★1.5 (fi 3) (either term, 18 hours). The economic theory of externalities and how alternative policy instruments such as taxes, tradable permits and regulatory standards are used to deal with externalities. Topics include current environmental issues such as competing in land uses, toxic emissions, water pollutions, Sulphur Dioxide and climate change. Environmental policies and policy debates are also discussed. Offered in a six-week period.

#### **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 614 Competitive Strategies in the International Business Environment**

★3 (fi 6) (either term, 3-0-0). This course provides an understanding of the design and implementation process of competitive strategies by firms with either multi-country or global operations. Emphasis is placed on competitive strategy frameworks, changing patterns of international competition, levels of analysis of international competition, and formulation and implementation of international competitive strategies. The material is illustrated by means of special case studies of Canadian firms. Prerequisite: BUEC 501, 511, 512 or MANEC 501, 511, 512. Credit will not be provided for both MANEC 614 and BUEC 614.

#### **BUEC 646 International Business**

★3 (fi 6) (either term, 3-0-0). Credit will not be given for both MANEC 646 and BUEC 646.

#### **BUEC 654 Doing Business in Japan**

★3 (fi 6) (either term, 3-0-0). The historical development of the key economic and social institutions which have shaped the Japanese business environment. Special focus on how these institutions have evolved, and to what extent they continue to be relevant. The notion that Japanese management practices are particularly unique will be challenged. Students will explore the evidence suggesting that such practices have become an obstacle in an environment of structural adjustment in the context of a deep business cycle. The course will be forward looking, with a focus on what type of economic structure Japan will have in the future, and what type of management and marketing strategies will be best suited to the new Japan. Prerequisite: BUEC 512 or MANEC 501. Credit will not be given for both MANEC 654 and BUEC 654.

#### **BUEC 664 Tax Factors in Business Decision Making**

★3 (fi 6) (either term, 3-0-0). Analysis of the tax factors relevant to policy and operating decisions in business. Emphasis on income taxation, especially corporate income taxation. The interests of general business executives are stressed rather than the detailed problems confronting tax specialists. An additional objective is to give sufficient background for an appraisal of the business and economic effects of proposed new developments in taxation and to understand implications from the standpoint of public policy. Prerequisites: BUEC 501, 511, 512 or MANEC 501, 511, 512. Credit will not be given for both MANEC 664 and BUEC 664.

#### **BUEC 670 Global Competition and Trade in Cultural Industries**

★3 (fi 6) (either term, 3-0-0). This course examines international competition in selected cultural and entertainment industries. Topics include trade issues, determinants of volume and composition of trade, US dominance and sources of competitive advantage, Canadian public policy and competitive strategy responses to this dominance, and the effects of new technologies include convergence. Credit will not be given for both MANEC 670 and BUEC 670.

#### **BUEC 678 Government Involvement in Business Management**

★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 501, 511, 512 or MANEC 501, 511, 512. Credit will not be given for both MANEC 678 and BUEC 678.

#### **BUEC 686 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 820 Business Economics**

★3 (fi 32) (first 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. Credit will not be given for both MANEC 820 and BUEC 820.

#### **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. Credit will not be given for both MANEC 850 and BUEC 850.

#### **BUEC 860 International Business**

★3 (*fi 6*) (first 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. Credit will not be given for both MANEC 860 and BUEC 860.

## 201.27 Business Law, B LAW

Department 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.

The following courses were renumbered effective 1997/98:

Old	New	Old	New
LEG R 301	B LAW 301	LEG R 428	B LAW 428
LEG R 402	B LAW 402	LEG R 442	B LAW 442
LEG R 403	B LAW 403	LEG R 488	B LAW 488
LEG R 422	B LAW 422	LEG R 495	B LAW 495

### 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 are analyzed.

#### **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.

#### **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.

#### **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.

#### **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.

#### **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 its created, what powers it possesses, how it uses its powers and how its powers are constrained. Prerequisite: B LAW 301.

#### **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). Corequisites: recommended BUEC 444 and FIN 442.

#### **B LAW 488 Selected Topics in Business Law**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: B LAW 301, or consent of Department.

#### **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 622 Law, Public Policy and the Canadian Managerial Environment**

★3 (*fi 6*) (either term, 3-0-0). Professional training for business or public administration has two principal dimensions: (1) the internal operation finance and control of organizations; and (2) the external environment (social, political, moral, legal, and natural) to which organizations must adapt themselves. This course provides basic graduate training in the environmental dimensions of management, not through a general survey of environmental factors, but rather through intensive analysis of selected features of the dynamic legal interface between business and society.

#### **B LAW 642 International Business Law**

★3 (*fi 6*) (either term, 3-0-0). Study of the law regulating the conduct of international business transactions. 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).

## 201.28 Canadian Studies, CANST

Department of Political Science, Canadian Studies Program  
Faculty of Arts

#### **Notes**

- (1) See also INT D 304 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.
- (2) Students seeking credit in any Canadian Studies course at the 400-level or above, should consult the Canadian Studies Advisor before registering.

### Undergraduate Courses

#### **01 CANST 100 Introduction to Canadian Studies**

★3 (*fi 6*) (either term, 3-0-0). Interdisciplinary exploration of enduring aspects of Canadian identity, experience and values as expressed through contemporary debates and events, from politics to sports to changing cultural practices. Not available to students with credit in CANST 200 or ETCAN 101.

#### **01 CANST 201 Places and Peoples: The Canadian West**

★3 (*fi 6*) (either term, 3-0-0). Interdisciplinary exploration of western Canadian regionalism in literature, politics and culture; regional distinctiveness and expression in a globalizing world.

#### **01 CANST 202 Places and Peoples: The Canadian North**

★3 (*fi 6*) (either term, 3-0-0). Interdisciplinary social science survey of northern Canada with reference to patterns of relationships both in northern Canada and between the North and the rest of Canada. Not available to students with credit in CANST 302.

#### **01 CANST 203 Peoples and Places: Canada's National Parks**

★3 (*fi 6*) (either term, 3-0-0). Studies the evolving construction of national parks as living symbols of Canadian identity and experience, interpreted through concepts of bounded space, wilderness, nature and industry, recreation and tourism, natural and cultural resources, parks policy and administration.

#### **01 CANST 304 Politics of the Arts in Canada**

★3 (*fi 6*) (either term, 0-3s-0). Interdisciplinary seminar on the changing nature of public support for the arts in Canada; political, economic, social and aesthetic factors shaping arts policies at the national, provincial and municipal levels; changing strategies used by arts constituencies to influence policy. Not open to students with credit in CANST 305 or 306.

#### **CANST 353 Foundations of Canadian Cultures**

★3 (*fi 6*) (either term, 0-3s-0). Canadian writers, philosophers, artists, educators and religious leaders define and defend their sense of the core principles and values of Canada and Canadians between 1660 and 1960. Prerequisite: consent of Instructor. Not open to students with credit in CANST 350 or CANST 351.

#### **CANST 354 Foundations of Canadian Social, Political and Economic Thought**

★3 (*fi 6*) (either term, 0-3s-0). Canadian social, political and economic development as interpreted by thinkers and analysts from the Loyalists to Harold Innis.

Prerequisite: consent of Instructor. Not open to students with credit in CANST 350 or CANST 352.

### **CANST 360 The National Question in Canada**

★3 (fi 6) (either term, 0-3s-0). Study of Canadian, Quebecois, and Aboriginal nationalisms in Canada's political, intellectual, and artistic traditions. Prerequisite: ★6 in CANST courses, or in Canadian content courses (in English or French), in economics, history, political science, or sociology; or consent of Department. Reading competence in French is required.

### **CANST 405 Legislating Canadian Culture**

★3 (fi 6) (either term, 0-3s-0). Interdisciplinary seminar on the problems of cultural policy raised by the increasingly transnational character of contemporary communications media. The seminar seeks to clarify the challenges, and the limits, to Canadian cultural policy in an era of globalization. Prerequisite: One of CANST 304, CANST 351, POL S 398, SOC 344 or consent of Instructor. Not open to students with credit in CANST 404.

### **CANST 406 Seminar in Canadian Studies**

★3 (fi 6) (either term, 0-3s-0).

### **CANST 407 Urbanity and Nature: Canada's Changing Cities and Countryside**

★3 (fi 6) (either term, 0-3s-0). Cultural and physical environments of selected Canadian cities, impacts of urban culture and lifestyles on rural Canada. Ideas and images of the city, countryside, nature and wilderness. Prerequisite: consent of Instructor.

### **CANST 408 Advanced Studies on Canada's Northern Peoples**

★3 (fi 6) (either term, 0-3s-0). Interdisciplinary seminar on contemporary issues facing residents of Canada's North.

### **CANST 409 Writing the Canadian North**

★3 (fi 6) (either term, 0-3s-0). British exploration accounts, English-Canadian poetry and non-fiction, Inuit autobiographies and federal government documents provide texts for a study of the narrative expansiveness of Canada's North. Prerequisite: consent of Instructor.

### **CANST 410 The Women's Movement in Contemporary Canada**

★3 (fi 6) (either term, 0-3s-0). Interdisciplinary exploration of the theories and practices of feminist organizing for change in Canada since 1960. Topics include: links with first-wave feminism in Canada; the 1970 Report of the Royal Commission on the Status of Women; coalitions and collectives; the law as an avenue of reform; the women's movement in Alberta and Edmonton.

### **CANST 450 Contemporary Canadian Issues**

★3 (fi 6) (either term, 0-3s-0). Interdisciplinary examination of selected political, economic, social, and cultural problems facing Canada at present. Note: Not open to students with credit in CANST 400. Open only to third- and fourth-year students.

### **CANST 456 Canadian Values, Voices, Criticism**

★3 (fi 6) (either term, 0-3s-0). A senior interdisciplinary seminar that focuses on selected writings that define and contest Canadian identity and values since 1945. Prerequisite: consent of Instructor.

### **CANST 457 Canadian Universities in Context**

★3 (fi 6) (either term, 0-3s-0). Studies the continuities and changes in Canadians' rationales for and defenses of postsecondary education. Examines public and private funding, the impact of federalism, academic freedom, town and gown, the plural university, liberal education and the professions, research institutes and think tanks. Prerequisite: consent of Instructor.

### **CANST 460 Discourses of Nationalism and Identity in Canada**

★3 (fi 6) (either term, 0-3s-0). Students explore in greater depth selected issues and thinkers introduced in CANST courses. Methodologically, there is an emphasis on discourse analysis and on interdisciplinary research and explanation. Prerequisite: consent of Instructor.

### **CANST 510 Directed Readings in Canadian Studies**

★3 (fi 6) (either term, 0-3s-0). Designed to meet the needs of individual students, normally in the final year of the BA (Canadian Studies), the BA (Etudes canadiennes) or Honors in Canadian Studies.

### **CANST 520 Honors Essay: Fourth-Year Honors Canadian Studies**

★6 (fi 12) (two term, 0-3s-0). Preparation of the Honors essay required in the fourth year of the program. Formerly CANST 409.

## 201.29 Canadien-Français, CA FR

Faculté Saint-Jean

### Cours de 1er cycle

#### **CANST 320 Civilisation canadienne-française I**

★3 (fi 6) (premier semestre, 3-0-0). La civilisation et la culture du Canada français des origines à la Confédération. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FR CA 222 à la Faculté des Arts.

#### **CANST 322 Civilisation canadienne-française II**

★3 (fi 6) (deuxième semestre, 3-0-0). La civilisation et la culture du Canada français de la Confédération à nos jours. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FR CA 223 à la Faculté des Arts.

#### **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. Prerequisite: FRANC 235. Note: ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FR CA 300 à la Faculté des Arts.

#### **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 Garneau à l'époque contemporaine. Prerequisite: 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 FR CA 422 à la Faculté des Arts.

#### **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. Prerequisite: 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 et pour FR CA 421 à la Faculté des Arts.

#### **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. Prerequisite: 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 FR CA 451 à la Faculté des Arts. Anciennement CA FR 451.

#### **CA FR 480 Choix de sujet**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Prerequisite: FRANC 225, 235 et ★3 en littérature de niveau 300.

#### **CA FR 482 Choix de sujet**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Prerequisite: 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. Prerequisite: FRANC 235 et ★3 en littérature de niveau 300. Recommandé: CA FR 350.

#### **CA FR 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 canadienne-française. Prerequisite: FRANC 235 et ★3 en littérature de niveau 300, préférablement CA FR 350.

## Cours de 2e cycle

### **CA FR 580 Choix de sujet en littérature québécoise ou canadienne d'expression française**

★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. Prerequisite: FRANC 225, 235, CA FR 350, ★3 en littérature de niveau 400, ou l'accord du Vice-doyen aux affaires académiques.

## 201.30 Capstone Courses, CAPS

Faculty of Agriculture, Forestry, and Home Economics

### Undergraduate Courses

#### **CAPS 400 Integrated Agricultural Resource Management**

★3 (fi 6) (either term, 0-3s-0). An exploration of production and environmental concerns and social issues related to agriculture, through large and small group discussion and written reports. Prerequisite: Open to fourth-year students in the BSc in Agriculture Program (to be taken in final year of program). [Agricultural, Food and Nutritional Science]

#### **CAPS 423 Management in Agriculture, Food and Forestry**

★3 (fi 6) (either term, 0-3s-0). Case studies of management topics in agriculture, food and forestry. Input from managers and technical specialists involved in planning, financing and managing selected agricultural, food and forestry businesses. Use of computer-assisted management approaches for selected case studies. Prerequisite: Open to fourth-year students in the Agricultural/Food Business Management and the Forest Business Management Programs, or by consent of Instructor. [Rural Economy]

**CAPS 440 Nutrition and Food Science**

★3 (fi 6) (either term, 0-3s-3). Integrated exploration of issues pertaining to food systems, technological processes, and food quality or nutrition and metabolism. Open to fourth-year students only. [Agricultural, Food and Nutritional Science]

**CAPS 444 Internship Seminar**

★3 (fi 6) (either term, 0-6s-0). Required by all students who have just completed an Agriculture, Forestry, and Home Economics Internship. Must be completed during the first academic term following return to full-time studies. Grade based on job performance as evaluated by the employer, a practicum report, and by an oral presentation. Prerequisite: WKEXP 983. [Faculty of Agriculture, Forestry, and Home Economics]

**201.31 Cell Biology, CELL**

Department of Biological Sciences and  
Department of Cell Biology and Anatomy  
Faculties of Medicine and Dentistry and Science

**Undergraduate Courses****CELL 300 Advanced Cell Biology I**

★3 (fi 6) (first term, 3-0-0). Senior course studying various topics in modern cell biology. Examines aspects of eukaryotic cell structure and function. Includes, but not restricted to, areas such as intracellular signaling, cell-cycling, protein targeting and organelle biogenesis, and cell-cell interactions. Makes extensive use of current literature to illustrate important concepts. Prerequisites: BIOL 201 and BIOCH 203/205.

**CELL 301 Advanced Cell Biology II**

★3 (fi 6) (second term, 3-0-0). Continuation of CELL 300, covering topics from CELL 300 in greater depth and recent developments in cell biology. Intended for, but not restricted to, students in the Cell Biology Honors and Specialization programs.

**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 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 and graduate students. 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, CELL 301 or permission of Instructor.

**CELL 495 Individual Study**

★3 (fi 6) (either term, 0-0-6). Registration contingent on the student's having made prior arrangements with a Faculty member in a department participating in the Cell Biology Program. Credit may be obtained for this course more than once. Prerequisites: A 300-level CELL, Biological Sciences, or Biochemistry course, and the consent of the Director of the Undergraduate Cell Biology Program.

**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. Prerequisite: A 300-level CELL, Biological Sciences, or Biochemistry course.

**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.

**Graduate Courses****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 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.

**201.32 Chemical Engineering, CH E**

Department of Chemical and Materials Engineering  
Faculty of Engineering

The following courses were renumbered effective 1993/94:

Old	New	Old	New
CH E 324	CH E 243	CH E 518	CH E 418
CH E 356	CH E 265	CH E 534	CH E 434
CH E 385	CH E 285	CH E 546	CH E 446
CH E 412	CH E 312	CH E 553	CH E 453
CH E 414	CH E 314	CH E 554	CH E 454
CH E 416	CH E 316	CH E 556	CH E 465
CH E 424	CH E 343	CH E 558	CH E 458
CH E 451	CH E 351	CH E 576	CH E 474
CH E 456	CH E 365	CH E 581	CH E 481
CH E 476	CH E 375	CH E 583	CH E 483
CH E 490	CH E 390		

**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, 3-1s-0). An introduction to the first and second laws of thermodynamics. Prerequisites: MATH 101, and EN PH 131. (★3)

**CH E 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; one tour to a local chemical plant. Prerequisites: ENCOMP 100, MATH 102 and CHEM 105. Corequisites: CH E 243 and MATH 209 or equivalent. (★3)

**CH E 285 An Introduction to the Process Industries**

□1 (fi 2) (first term, 1-0-0). Introduction to Chemical and Materials Engineering and processing with special reference to Alberta. (★1)

**CH E 312 Fluid Mechanics**

□3.5 (fi 6) (first 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; compressible flow in pipes; drag on submerged bodies and flow through porous media. Prerequisites: CH E 243, MATH 201, MATH 209. (★3)

**CH E 314 Heat Transfer**

□4 (fi 6) (either term or Spring/Summer, 3-1s-4/4). Principles of conduction, convection and radiation heat transfer. Design and performance analysis of thermal systems based on these principles. Corequisite: CH E 312. (★3)

**CH E 316 Equilibrium Stage Processes**

□4 (fi 6) (first term or Spring/Summer, 3-0-2). Design of separation processes with emphasis on the equilibrium stage concept, distillation, absorption and extraction. Prerequisites: CH E 265 and 343. (★3)

**CH E 343 Chemical Engineering Thermodynamics**

□3.5 (fi 6) (first term, 3-1s-0). Thermodynamics of non-ideal gases and liquids; vapour-liquid equilibrium, thermodynamics of chemical processes and multicomponent systems. Prerequisites: CH E 243 and 265. (★3)

**CH E 351 Chemical Engineering Laboratory I**

□3.5 (fi 6) (first term, 2-0-3). Technical report writing; thermodynamics, material, and energy balances, and calibration experiments. Prerequisite: ENGL 199 or equivalent. Pre- or corequisites: CH E 243, 265 and 312. (★3)

**CH E 365 Chemical Engineering Design I**

□4.5 (fi 6) (either term, 3-0-3). Engineering design concepts; cost estimation; project planning and scheduling; plant safety and hazards analysis; selected project design examples. Prerequisites: CH E 265 and 343 and MEC E 310. Pre- or corequisites: CH E 314 and 316. (★3)

**CH E 375 Mathematical Applications**

□3.5 (*fi 6*) (first term, 3-1s-0). Statistical analysis of engineering problems and experimental design. Prerequisite: STAT 235 or equivalent. (★3)

**CH E 390 Introduction to Biochemical Engineering**

□3.5 (*fi 6*) (either term or Spring/Summer, 3-0-1). Physical and chemical properties of cells, tissues, and biological fluids; engineering analysis of processes such as cell growth and fermentation; purification of products. Prerequisite: CH E 265 or BIOL 107. (★3)

**CH E 418 Diffusion Operations**

□4 (*fi 6*) (second 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: CH E 314 and 343. (★3)

**CH E 434 Chemical Reactor Analysis**

□3.5 (*fi 6*) (second term or Spring/Summer, 3-1s-0). Kinetics of chemical reactions; design of chemical reactors. Prerequisite: CH E 343. (★3)

**CH E 436 Colloids and Surfaces**

□3.5 (*fi 6*) (Spring/Summer, 3-1s-0). Interactions between fluid phases and solids; micelles; electrokinetic phenomena; adsorption isotherms; applications to industrial processes. Prerequisite: CH E 343. (★3)

**CH E 446 Process Dynamics and Control**

□3.8 (*fi 6*) (either term or Spring/Summer, 3-0-3/2). Introduction to process modeling and transient response analysis; design and analysis of feedback systems; stability analysis; process control applications; data acquisition and process control using digital computers. Prerequisites: MATH 201 or equivalent, MATH 209. Corequisites: CH E 312 and 314 or equivalents. (★3)

**CH E 453 Chemical Engineering Laboratory II**

□3 (*fi 6*) (first term or Spring/Summer, 1-0-4). Experiments in fluid mechanics. Prerequisites: CH E 312 and 351. (★3)

**CH E 454 Chemical Engineering Laboratory III**

□3 (*fi 6*) (second term, 1-0-4). Experiments in kinetics and mass transfer. Prerequisites: CH E 316, 418, 434 and one of CH E 453 or 540. (★3)

**CH E 458 Chemical Engineering Laboratory IV**

□3 (*fi 6*) (either term or Spring/Summer, 1-0-4). Projects in Chemical Engineering. Prerequisite: consent of Department. (★3)

**CH E 465 Chemical Engineering Design II**

□4 (*fi 6*) (second term, 1-0-6). Integration of chemical engineering practice, theory and economics into the design and evaluation of proposed capital projects. Prerequisites: CH E 316, 365 and 434. (★3)

**CH E 474 Computational Methods in Engineering**

□3.5 (*fi 6*) (either term, 3-1s-0). Mathematical formulation of chemical 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. (★3)

**CH E 481 Colloquium I**

□0.5 (*fi 2*) (first term or Spring/Summer, 0-1s-0). Oral presentations. Graded on a pass/fail basis. Prerequisite: 85 units completed or consent of Instructor. (★1)

**CH E 483 Colloquium II**

□0.5 (*fi 2*) (second term, 0-1s-0). Oral presentation of technical material. Graded on a pass/fail basis. Prerequisite: CH E 481. (★1)

**CH E 502 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 or prerequisite: CH E 316. (★3)

**CH E 520 Mixing in the Process Industries**

□4 (*fi 6*) (either term or Spring/Summer, 3-1s-1). Design and operation of agitation equipment in the process industries. Process results ranging from blending, solids suspension, and gas dispersion to reactor design and heat transfer will be examined. Emphasis on critical application of the fundamentals of chemical engineering. Laminar and turbulent regimes, stirred tanks and static mixers, and other specialized applications will be discussed. Prerequisites: CH E 265 and 312. Credit cannot be obtained in this course if credit has already been obtained in CH E 620. (★3)

**CH E 522 Hydrocarbon Fluid Properties and Processing**

□3.5 (*fi 6*) (either term or Spring/Summer, 3-1s-0). Introduction to the physical, chemical and engineering principles required for the design and operation of plants used for the treatment of natural gas, heavy oils and bitumens. Prerequisite or corequisite: CH E 343. (★3)

**CH E 536 Chemical Kinetics and Catalysis**

□3.5 (*fi 6*) (either term or Spring/Summer, 3-1s-0). Characterization of heterogeneous catalysts; mechanisms and kinetics of heterogeneously catalyzed reactions. Prerequisite: CH E 434 or consent of Instructor. (★3)

**CH E 538 Polymer Reactor Engineering**

□3.5 (*fi 6*) (either term or Spring/Summer, 3-1s-0). Introduction to chain and step polymerization kinetics; physical, chemical and mechanical characterization methods for polymers; bulk, suspension, solution and emulsion polymerization processes; copolymers; polymerization reactor design and control. Prerequisite: CH E 434 or consent of Instructor. (★3)

**CH E 539 Introduction to Polymer Science and Engineering**

□3.5 (*fi 6*) (either term or Spring/Summer, 3-1s-0). Physical and chemical properties of polymers; polymer characterization; polymer solution thermodynamics; melts, glasses elastomers, and crystalline materials; mechanical properties; processing. Prerequisite: CH E 312 or equivalent, STAT 235 or equivalent, and CHEM 261 or equivalent, or consent of Instructor. (★3)

**CH E 540 Introduction to Real-Time Computer Applications**

□3.8 (*fi 6*) (first term, 3-0-3/2). Introduction to real-time computer hardware and operating systems; data acquisition techniques; supervisory and direct digital control; industrial and laboratory applications. Laboratory involves student use of Department's real-time digital computer and interfaced applications. Prerequisite: ENCMP 100 or equivalent. (★3)

**CH E 555 Process Optimization**

□3.5 (*fi 6*) (either term or Spring/Summer, 3-1s-0). Single and multivariable search techniques; linear programming; dynamic programming; EVOP; nonlinear programming. Prerequisites: CH E 314 and MATH 201 or consent of Instructor. (★3)

**CH E 562 Process Modeling and Simulation**

□3.8 (*fi 6*) (second term, 3-0-3/2). Modeling of process systems; digital simulation; numerical solutions. Prerequisites: CH E 314 and 446 or equivalent. Prerequisite or corequisite: CH E 434. (★3)

**CH E 564 Process Control**

□3.8 (*fi 6*) (second term, 3-0-3/2). Computer process control techniques; discrete-time response of dynamic systems; sampling of continuous signals; Z-transform representation; design of digital feedback controllers; linear and nonlinear system analysis. Prerequisite: CH E 446 or equivalent. (★3)

**CH E 580 Pulp and Paper Manufacture, Chemical Engineering, and Environmental Impact**

□3.5 (*fi 6*) (either term or Spring/Summer, 3-1s-0). This course describes the resources, processes and chemistry, design and flow sheets, environmental impact, and remediation of pulp and paper manufacture with special reference to Alberta. Prerequisite: CH E 312 or consent of Instructor. (★3)

**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. (★3)

**Graduate Courses****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. (★3)

**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. (★3)

**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. (★3)

**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. (★3)

**CH E 620 Mixing in the Process Industries**

□4 (*fi 6*) (either term, 3-1s-1). Design and operation of agitation equipment in the process industries. Process results ranging from blending, solids suspension, and gas dispersion to reactor design and heat transfer will be examined. Emphasis on critical application of the fundamental principles of chemical engineering, combined with current research results. Credit cannot be obtained in this course if credit has already been obtained in CH E 520. (★3)

**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. (★3)

**CH E 625 Statistical Thermodynamics**

□3 (*fi 6*) (either term, 3-0-0). Introduction to the principles of statistical thermodynamics. Construction of partition functions and calculations of basic

thermodynamic properties for several fundamental systems. Applications include properties of ideal gases, ideal solids and absorbed gases. Prerequisite: MEC E 640 or consent of Instructor. (★3)

#### CH E 631 Rheology of Polymers and Other Complex Fluids

□3 (*fi 6*) (either term, 3-0-0). General principles of liquid-state rheology. Modeling stress behavior in terms of continuum mechanics. Measurement techniques for nonlinear and viscoelastic properties, in shear and elongational flows. Interpretation of macroscopic properties of polymers in terms of molecular characteristics. Dynamical modeling of polymer chains in solutions and melts. (★3)

#### CH E 632 Polymer Melt Processing

□3 (*fi 6*) (either term, 3-0-0). Fluid mechanical fundamentals of melt processing operations. Extrusion, fibre spinning, calendering, 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. (★3)

#### 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. (★3)

#### CH E 636 Advanced Chemical Kinetics and Catalysis

□3 (*fi 6*) (either term, 3-0-0). Gas phase reactions; kinetics in liquid solutions; characterization of catalysts; heterogeneous catalysts. (★3)

#### CH E 639 Polymer Engineering and Science

□3 (*fi 6*) (either term, 3-0-0). Polymerization; molar mass distributions and measurement; chain conformations; solution thermodynamics; amorphous and crystalline states; physical properties of melts, elastomers, and plastics; melt processing; mechanical properties. (★3)

#### CH E 646 Process Dynamics and Computer Process Control

□3.5 (*fi 6*) (first term, 3-0-3/3). An introductory graduate level course in process dynamics and control. Topics include dynamic process modeling, simulation, estimation, filtering, multiloop and multivariable control, plus stability and performance analysis. (★3)

#### CH E 648 Engineering Applications of Artificial Intelligence

□3 (*fi 6*) (either term, 3-0-0). Review of computer engineering, knowledge processing techniques, problem solving, reasoning, representation, expert system, AI tools and languages, coupling system, knowledge integration, distributed intelligent system, blackboard architecture, common sense system, object-oriented programming, human factors, neural network, engineering applications. (★3)

#### CH E 654 Optimization of Process Systems

□3 (*fi 6*) (either term, 3-0-0). Applications of optimization techniques to process design and operation. Multivariable search techniques; linear programming; distribution and critical path networks; nonlinear programming; dynamic programming; integer and mixed programming. Optimization in CAPD programs. (★3)

#### CH E 662 Dynamics of Process Systems

□3.8 (*fi 6*) (second term, 3-0-3/2). Analysis and simulation of the dynamics of chemical engineering systems; process identification techniques; on-line characterization of process dynamics. Prerequisite: CH E 646 or consent of Instructor. (★3)

#### CH E 664 Advanced Process Control

□3.5 (*fi 6*) (first term, 3-0-3/3). Selected topics related to multivariable control: continuous systems, discrete systems, frequency domain analysis, stability and/or robustness and performance. Emphasis on current developments in the literature, plus process applications. Prerequisite: CH E 646. (★3)

#### 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. (★3)

#### CH E 676 Applied Mathematics

□3 (*fi 6*) (either term, 3-0-0). Application of mathematics to engineering problems with emphasis on operator methods. (★3)

#### CH E 683 Graduate Seminar I

□0.5 (*fi 2*) (either term, 0-1s-0). Discussion of progress and problems in research in Chemical Engineering. (★1)

#### CH E 684 Graduate Seminar II

□0.5 (*fi 2*) (either term, 0-1s-0). Discussion of progress and problems in research in Chemical Engineering. Prerequisite: CH E 683. (★1)

#### CH E 685 Graduate Seminar III

□0.5 (*fi 2*) (either term, 0-1s-0). Discussion of progress and problems in research in Chemical Engineering. Prerequisite: CH E 684. (★1)

#### CH E 686 Graduate Seminar IV

□0.5 (*fi 2*) (either term, 0-1s-0). Discussion of progress and problems in research in Chemical Engineering. Prerequisite: CH E 685. (★1)

#### 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. (★3)

#### CH E 696 Special Topics in Process Dynamics and Computer 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. (★3)

#### CH E 900 Directed Research Project

★3 (*fi 6*) (variable, unassigned).

## 201.33 Chemistry, CHEM

Department of Chemistry  
Faculty of Science

### Undergraduate Courses

#### CHEM 101 Introductory University Chemistry I

★3 (*fi 6*) (either term, 3-1s-3). Atomic structure, covalent bonding, thermochemistry, chemical equilibrium, acids and bases, descriptive chemistry of the main-group elements. Prerequisite: Chemistry 30, or equivalent.

#### CHEM 102 Introductory University Chemistry II

★3 (*fi 6*) (either term, 3-1s-3). States of matter and intermolecular forces, solubility and solutions, electrochemistry, thermodynamics, chemical kinetics, bonding and properties of transition-metal complexes. Prerequisite: CHEM 101.

#### CHEM 103 Introductory University Chemistry I

□4.3 (*fi 6*) (either term, 3-1s-3/2). Atomic structure, covalent bonding, thermochemistry, chemical equilibrium, acids and bases, descriptive chemistry of the main-group elements. Prerequisite: Chemistry 30, or equivalent. Note: Restricted to Engineering students only. (★3).

#### CHEM 105 Introductory University Chemistry II

□3.8 (*fi 6*) (either term, 3-0-3/2). States of matter and intermolecular forces, solubility and solutions, electrochemistry, thermodynamics, chemical kinetics, bonding and properties of transition-metal complexes. Prerequisite: CHEM 103. Note: Restricted to Engineering students only. (★3).

#### CHEM 161 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 with credit in CHEM 101 and 102 normally will proceed to CHEM 261. Such students may enrol in CHEM 161 only if written consent of the Department is obtained. Prerequisite: Chemistry 30 or equivalent.

#### CHEM 163 Organic Chemistry II

★3 (*fi 6*) (second term, 3-0-3). Continuation of the study of structure and reactivity of functional groups with special emphasis on molecules important to biology (e.g., fats, sugars, medicinal agents, antibiotics, amino acids, proteins, nucleic acids). Functional groups covered will include alcohols, aromatics, carbonyl compounds (aldehydes, ketones, carboxylic acid derivatives) and amines. Molecules found in everyday life (soaps, detergents, fibers, perfumes, and biopolymers) will be discussed. Prerequisite: CHEM 161.

#### 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 100 or 102 or 104.

#### 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.

#### CHEM 241 Inorganic Chemistry I

★3 (*fi 6*) (second term, 3-0-3). Bonding, structure and chemical properties of inorganic compounds with emphasis on the main group elements. Note: This course may not be taken for credit if credit has already been received in CHEM 330 or 331. For Chemistry Honors and Specialization students only, except by consent of Department. Prerequisites or corequisites: CHEM 273 and CHEM 160/163 or 260/263.

#### CHEM 261 Organic Chemistry I

★3 (*fi 6*) (first 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 100, 102, 104 or 105. Note: Students who have obtained credit for CHEM 161 cannot take CHEM 261 for credit. (□4.5)

#### **CHEM 263 Organic Chemistry II**

★3 (fi 6) (second 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. Prerequisite: CHEM 261. Note: Students who have obtained credit for CHEM 163 cannot take CHEM 263 for credit. (□4.5)

#### **CHEM 271 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 and the application of these principles to systems of interest to chemists, biochemists, and engineers will be emphasized. Prerequisites: CHEM 100 or 102 or 104 or 105 and MATH 101 or 115. (□4.5)

#### **CHEM 273 Physical Properties and Dynamics of Chemical Systems**

★3 (fi 6) (second term, 3-0-3). A continuation of CHEM 271 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. Prerequisite: CHEM 271.

#### **CHEM 275 Physical Properties and Dynamics of Chemical Systems**

□3.8 (fi 6) (second term, 3-0-3/2). A continuation of CHEM 271 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. Prerequisite: CHEM 271 or CHEM 343. Note: This course is only available for students in the Faculty of Engineering. (★3)

#### **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 100, 102, or 104; CHEM 160, 163, 260, or 263; CHEM 212 or 213.

#### **CHEM 305 Environmental Chemistry II**

★3 (fi 6) (second term, 3-0-4). A continuation of CHEM 303 with laboratory applications. Experiments will illustrate and complement the principles and processes taught in CHEM 303 such as adsorption from aqueous solutions, convective/diffusive transport, vapour/solution equilibria, metal ion speciation with soil derived ligands, photochemistry, properties of aerosols, 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. There will be one or more field trips. Prerequisite: CHEM 160, 163, 260 or 263; CHEM 212 or 213 and either CHEM 303 or 273. Note: Restricted to students in the Environmental Physical Sciences and Chemistry (Honors, Specialization, and General Science with concentration in Chemistry) programs.

#### **CHEM 311 Instrumental Analysis for Engineers**

□4.5 (fi 6) (second term, 3-0-3). Fundamentals of volumetric, chromatographic, spectrographic, and electrochemical analysis. Volumetric techniques are covered briefly. Instrumental techniques discussed include gas and liquid chromatography, UV and IR spectroscopy, ion-selective electrodes and voltammetry. Emphasis is on the principles of each method, and the nature of matrix and other effects that influence the quality of the data obtained. Reference will be made to applications such as air and water quality, and process analyzers in manufacturing. Prerequisites: CHEM 261 and 271 or CHEM 275 or CHEM 343. Note: Restricted to Engineering students only. (★3)

#### **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 212 or 213; 273 or 275; ★6 in junior Physics.

#### **CHEM 331 Basic Inorganic Chemistry I**

★3 (fi 6) (first term, 3-0-3). Basic bonding, structural principles, and chemical properties of inorganic compounds with emphasis on the main group elements. Note: No credit is available for this course in the Honors and Specialization Chemistry programs. Prerequisite: CHEM 100, 102, or 104; CHEM 160, 163, 260, or 263.

#### **CHEM 332 Basic Inorganic Chemistry II**

★3 (fi 6) (second term, 3-0-3). A continuation of CHEM 331 with emphasis on the bonding, structure, properties, and reactions of transition metal complexes and their organometallic derivatives. Note: Students in the General program wishing to transfer into Specialization or Honors Chemistry programs will be given ★3 for CHEM 331 and CHEM 332 and must take CHEM 341 to satisfy the requirements of these programs Prerequisite: CHEM 331.

#### **CHEM 341 Inorganic Chemistry II**

★3 (fi 6) (first term, 3-0-3). A continuation of CHEM 241 with emphasis on the transition metals. Note: For Chemistry Honors and Specialization students only, except by consent of Department. Prerequisites: CHEM 241; or CHEM 330; or CHEM 332 and consent of Department.

#### **CHEM 361 Organic Chemistry**

★3 (fi 6) (first term, 3-0-4). Mechanisms and reactions of aromatic and aliphatic compounds. Prerequisites: CHEM 100, 102, or 104; CHEM 160, 163, 260, or 263.

#### **CHEM 363 Organic Chemistry**

★3 (fi 6) (second term, 3-0-4). A continuation of CHEM 361. Prerequisite: CHEM 361.

#### **CHEM 375 Atoms, Molecules, and Electromagnetic Radiation**

★3 (fi 6) (second term, 3-0-0). A course dealing with atoms, molecules and electromagnetic radiation, and spectroscopic and photochemical applications of their interaction. The emphasis is on the qualitative appreciation of the phenomena and their uses. No credit is available for this course in Honors or Specialization Chemistry Programs. Prerequisites: CHEM 273 and ★6 of junior physics.

#### **CHEM 381 Introduction to Quantum Chemistry**

★3 (fi 6) (first term, 3-0-4). The methods of quantum mechanics are introduced and applied to simple systems related to chemistry. After the essential results of quantum mechanics are outlined, the discussion of atomic and molecular structure will guide the student from the hydrogen atom through many-electron atoms and the hydrogen molecular ion to the first neutral molecule, the diatomic hydrogen molecule. 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 273; MATH 215; and PHYS 238.

#### **CHEM 383 Elements of Molecular Structure and Spectroscopy**

★3 (fi 6) (second term, 3-0-4). The course is a continuation of CHEM 381 and introduces the student to the practical applications of quantum chemistry. The subjects will include: molecular orbital theories of the electronic structure of larger molecules, rotational spectroscopy, rotation-vibration spectroscopy, electronic spectroscopy of atoms and molecules, and magnetic resonance spectroscopy. Next, by using elements of statistical thermodynamics, the student will learn about the relation between the macroscopic thermodynamic properties of molecular systems, enthalpy, entropy and Gibbs free energy, and the microscopic molecular properties, energy levels. Prerequisite: CHEM 381.

#### **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 1 to 9 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 402.

#### **CHEM 401 Introduction to Chemical Research**

★3 (fi 6) (either term, 0-1s-8). Introduction to methods of chemical research. For students in the fourth year of Honors or Specialization Chemistry. Prerequisites: A 300-level Chemistry course and a GPA of at least 7.0 in all chemistry courses.

#### **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, 3-0-3). Prerequisite: A 300-level Chemistry course.

#### **CHEM 413 Electronics, Noise, and Signal Processing**

★3 (fi 6) (either term, 3-0-3). Linear electronics including operational amplifiers. Digital electronics including timing circuits, counters and logic. Fundamental and practical sources of noise in electronic circuits. Noise distributions. Data

processing including filtering and linear and nonlinear regression analysis. Prerequisite: CHEM 313 and consent of Department.

#### **CHEM 415 Analytical Electrochemistry**

★3 (fi 6) (second term, 3-0-3). This course covers the theory and application of modern electroanalytical techniques including potentiometry, polarography and cyclic voltametry. Analytical applications of ion selective electrodes, chemically modified electrodes and other electrochemical sensors are also discussed. Introduction to electrode characterization with techniques such as scanning probe microscopy is also presented. Prerequisite: CHEM 313.

#### **CHEM 417 Analytical Spectroscopy**

★3 (fi 6) (second term, 3-0-3). Optical spectrochemical measurement systems are discussed including dispersive and interferometric spectrometers, detectors, lasers, readout systems and data processing. Techniques covered include all optical methods for analytical emission, absorption, luminescence and scattering measurements on atomic and molecular systems from the far-IR to the vacuum ultraviolet. Prerequisite: CHEM 313.

#### **CHEM 419 Bioanalytical Chemistry**

★3 (fi 6) (first term, 3-0-0). Introduction to biomolecules. Electrophoresis and process chromatography. Protein and DNA sequence determination. Immunoassay. Restriction enzymes, vectors, and cloning. Good laboratory practice. Prerequisite: CHEM 313.

#### **CHEM 421 Analytical Separations**

★3 (fi 6) (first term, 3-0-0). The principles of phase-distribution processes, electrokinetic phenomena, column bandbroadening and extra-column bandbroadening are applied to commonly used modes of packed-bed and open-tubular gas and liquid chromatography and to capillary electrokinetic separations. Prerequisite: CHEM 313.

#### **CHEM 423 Analytical Mass Spectrometry**

★3 (fi 6) (either term, 3-0-0). An introduction to the principles, instruments, and applications of mass spectrometry for chemical and biochemical analysis. Topics discussed: vacuum systems; sample introduction methods; ionization methods; mass analyzers; tandem MS; ion detection; data system; mechanisms and techniques of ion fragmentation; interpretation of mass spectra; applications of mass spectrometry to environmental pharmaceutical, and biological samples. Prerequisite CHEM 313.

#### **CHEM 433 Structure in the Solid State**

★3 (fi 6) (first term, 3-0-0). An introduction to X-ray crystallography. This course covers the following topics: (1) the nature and origin of X-rays; (2) crystal symmetry; (3) diffraction theory; (4) theory and practical aspects of X-ray data collection; (5) Fourier analysis and structure solution; (6) least-squares refinement and other techniques used in structure solution; and (7) discussions and interpretations of X-ray structures from the literature. Prerequisite: CHEM 341.

#### **CHEM 437 Transition Metal Chemistry**

★3 (fi 6) (second 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 p-ligands; metal-carbon s- and multiple bonds. The application of these complexes to homogeneous catalysis and to organic synthesis will be discussed when appropriate. Prerequisite: CHEM 341.

#### **CHEM 439 Inorganic Reaction Mechanisms**

★3 (fi 6) (first 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 341.

#### **CHEM 461 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. Prerequisite: CHEM 363 or consent of Instructor.

#### **CHEM 465 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. Prerequisite: CHEM 363 or consent of Instructor.

#### **CHEM 467 Advanced Organic Synthesis**

★3 (fi 6) (first term, 3-0-0). A presentation of chemoselective, regioselective and stereoselective reactions of organic compounds, with an 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.

#### **CHEM 479 Molecular Kinetics**

★3 (fi 6) (second 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, MATH 215, PHYS 238, and a 300-level Chemistry course.

#### **CHEM 483 Applications of Nuclear Magnetic Resonance**

★3 (fi 6) (second 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.

#### **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 383.

#### **CHEM 493 Computational Chemistry**

★3 (fi 6) (first 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.

## 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 523 Special Topics in Advanced Analytical Chemistry**

★3 (fi 6) (either term, 3-0-0).

#### **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 541 Spectroscopic Techniques in Inorganic Chemistry**

★3 (fi 6) (either term, 3-0-0).

#### **CHEM 543 The Chemistry of the Main Group Elements**

★3 (fi 6) (second term, 3-0-0).

#### **CHEM 545 Special Topics in Inorganic Chemistry**

★30 (fi 6) (either term, 3-0-0).

#### **CHEM 565 Special Topics in Physical Organic Chemistry**

★3 (fi 6) (second 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. Prerequisite: CHEM 363 or consent of Instructor.

#### **CHEM 567 Special Topics in Synthetic Chemistry**

★3 (fi 6) (second 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 363 or consent of Instructor.

#### **CHEM 569 Special Topics in Bio-organic Chemistry**

★3 (fi 6) (second 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. Prerequisite: CHEM 363 or consent of Instructor.

#### CHEM 581 Special Topics in Physical Chemistry

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

#### CHEM 599 Fundamentals and Applications of Mass Spectrometry

★3 (fi 6) (second 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.

## 201.34 Chimie, CHIM

Faculté Saint-Jean

### Cours de 1er cycle

#### CHIM 101 Introduction à la chimie I

★3 (fi 6) (premier semestre, 3-1s-3). Stoechiométrie, gaz parfaits, thermochimie, équilibre chimique, acides et bases, structure atomique et liaison chimique. Prérequis: Chimie 30 ou l'équivalent.

#### CHIM 102 Introduction à la chimie II

★3 (fi 6) (deuxième semestre, 3-1s-3). Solubilité, cellule électrochimique et équation de Nerst, cinétique chimique, modes de liaison et structure, chimie des éléments de transition. Prérequis: CHIM 101.

#### 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. Nomenclature, structure tridimensionnelle, propriétés physiques et réactivité de composés de carbone. L'accent sera mis sur les hydrocarbures (produits pétroliers) les composés organiques halogénés (pesticides), et les polymères d'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. Prérequis: Chimie 30 ou l'équivalent.

#### CHIM 163 Chimie organique II

★3 (fi 6) (deuxième semestre, 3-0-3). Continuation de l'étude de la structure et réactivité des groupes fonctionnels avec accent sur les molécules importantes en biologie (corps gras, sucres, médicaments, amino-acides, protéines, acides nucléiques) aussi bien que les molécules de tous les jours (savons, détergents, fibres, parfums et biopolymères). Prérequis: CHIM 161.

#### CHIM 261 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. Nomenclature, structure tridimensionnelle, propriétés physiques et réactivité de composés de carbone. L'accent sera mis sur 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. Détermination des structures des composés organiques. Note: ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en CHIM 161. Prérequis: CHIM 100 ou 102 ou 104.

#### CHIM 263 Chimie organique II

★3 (fi 6) (deuxième semestre, 3-0-3). Continuation de l'étude de la structure et réactivité des groupes fonctionnels avec accent sur les molécules importantes en biologie (corps gras, sucres, médicaments, amino-acides, protéines, acides nucléiques) aussi bien que les molécules de tous les jours (savons, détergents, fibres, parfums et biopolymères). Note: ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en CHIM 163. Prérequis: CHIM 261.

## 201.35 Chinese, CHINA

Department of East Asian Studies  
Faculty of Arts

### Undergraduate Courses

**Note:** Those students wishing to major in Chinese are strongly encouraged to start with the intensive courses. The following courses with the exception of CHINA 211, 212, 311, and 312 are designed primarily for students whose first

language is not Chinese, and are not open to students with credit in matriculation-level Chinese.

#### CHINA 100 Intensive Chinese I

★6 (fi 12) (either term, 0-10L-0). An intensive introduction to Mandarin Chinese. This course is equivalent to CHINA 101/102. Normally students proceed from CHINA 100 to 200. CHINA 100 and 101/102 may not both be taken for credit.

#### CHINA 101 Non-Intensive Chinese I

★3 (fi 6) (either term, 0-5L-0). A non-intensive introduction to Mandarin Chinese. CHINA 100 and 101 may not both be taken for credit.

#### CHINA 102 Non-Intensive Chinese II

★3 (fi 6) (either term, 0-5L-0). A continuation of CHINA 101. Prerequisite: CHINA 101. CHINA 100 and 102 may not both be taken for credit.

#### CHINA 180 Basic University Chinese I

★3 (fi 6) (either term, 0-5L-0). A course designed for students with some prior knowledge of spoken Mandarin Chinese but needing training in reading and writing. Note: Not open to students with credit in CHINA 100, 101, or 102. Prerequisite: consent of Department.

#### CHINA 200 Intensive Chinese II

★6 (fi 12) (second term, 0-10L-0). A continuation of CHINA 100. CHINA 200 and 201/202 may not both be taken for credit. Prerequisite: CHINA 100 or 102. Formerly CHINA 300.

#### CHINA 201 Non-Intensive Chinese III

★3 (fi 6) (either term, 0-5L-0). A continuation of CHINA 101/102. The course is designed to develop further basic skills in spoken and written Chinese. CHINA 200 and 201 may not both be taken for credit. Prerequisite: CHINA 100 or 102. CHINA 201/202 is roughly the equivalent of CHINA 200. Note: Not open to students with credit in CHINA 303. Formerly CHINA 303. Formerly CHINA 301.

#### CHINA 202 Non-Intensive Chinese IV

★3 (fi 6) (either term, 0-5L-0). A continuation of CHINA 101/102. The course is designed to develop further basic skills in spoken and written Chinese. CHINA 200 and 202 may not both be taken for credit. Prerequisite: CHINA 100 or 102. CHINA 201/202 is roughly the equivalent of CHINA 200. Note: Not open to students with credit in CHINA 303. Formerly CHINA 303.

#### CHINA 211 Modern Standard Chinese for Those Proficient in Other Dialects I

★3 (fi 6) (first term, 3-0-1). This course is designed for speakers proficient in one of the regional dialects of Chinese to gain fluency in the standard language. Prerequisite: Proficiency in any of the regional dialects of China. Note: Open only to students with a background in Chinese language. Formerly CHINA 311.

#### CHINA 212 Modern Standard Chinese for Those Proficient in Other Dialects II

★3 (fi 6) (second term, 3-0-1). Continuation of CHINA 211. Prerequisite: CHINA 211. Note: Open only to students with a background in Chinese language. Formerly CHINA 312.

#### CHINA 230 Heritage of China: Texts and Context

★3 (fi 6) (either term, 3-0-0). An introductory level course designed to acquaint students with themes and ideas revealed in literature that are central to the Chinese perspective. Note: This course will not fulfil the Language other than English requirement of the BA degree.

#### CHINA 250 The Chinese Language in Its Cultural Setting I

★6 (fi 12) (Spring/Summer, 0-15L-0). (Spring/Summer abroad only). Oral immersion course to be studied abroad. Designed for improvement of oral/aural skills at senior elementary level. Prerequisites: CHINA 202 and 280 and or consent of Department. Note: CHINA 250 and 350 may not both be taken for credit.

#### CHINA 280 Basic University Chinese II

★3 (fi 6) (either term, 0-5L-0). A continuation of CHINA 180. Note: Not open to students with credit in CHINA 200, 201, or 202. Upon the completion of CHINA 280 students may proceed to CHINA 301. Prerequisite: CHINA 180.

#### CHINA 301 Intermediate Chinese I

★3 (fi 6) (first term, 0-4L-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 200, 202, or 280.

#### CHINA 302 Intermediate Chinese II

★3 (fi 6) (second term, 0-4L-0). A continuation of CHINA 301. Prerequisite: CHINA 301.

#### CHINA 318 Business Chinese: Language and Culture

★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, 280 and 301.

#### CHINA 323 Early Literature in English Translation I

★3 (fi 6) (either term, 3-0-0). Chinese literature from earliest times through the Tang dynasty. Lectures in English. No prerequisite. Note: This course will not fulfil the Language other than English requirement of the BA degree.



**CHINA 324 Early Literature in English Translation II**

★3 (fi 6) (either term, 3-0-0). Chinese literature from the Song through the Qing Dynasties. Lectures in English. No prerequisite. Note: This course will not fulfil the Language other than English requirement of the BA degree.

**CHINA 327 Modern Literature in English Translation I**

★3 (fi 6) (either term, 3-0-0). Chinese literature from 1912 to 1949. Lectures in English. No prerequisite. Note: This course will not fulfil the Language other than English requirement of the BA degree.

**CHINA 328 Modern Literature in English Translation II**

★3 (fi 6) (either term, 3-0-0). Chinese literature from 1949 through the present. Lectures in English. No prerequisite. Note: This course will not fulfil the Language other than English requirement of the BA degree.

**CHINA 341 Introduction to 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.

**CHINA 342 Introduction to Classical Chinese II**

★3 (fi 6) (second term, 3-0-0). A continuation of CHINA 341. Prerequisite: CHINA 341.

**CHINA 350 The Chinese Language in its Cultural Setting II**

★6 (fi 12) (two term, 0-15L-0). Oral immersion course to be studied abroad. Designed for improvement of oral/aural skills at senior intermediate level. Prerequisite: CHINA 302 or consent of Department. Formerly CHINA 450.

**CHINA 407 Advanced Chinese: Film and Drama**

★3 (fi 6) (either term, 3-0-0). Further development of language skills through study of film and drama. Prerequisite: CHINA 302.

**CHINA 408 Advanced Chinese: Modern Fiction**

★3 (fi 6) (either term, 3-0-0). Further development of language skills through reading of texts of modern Chinese fiction selected from the May Fourth period down to the present. Prerequisite: CHINA 302.

**CHINA 413 Advanced Chinese: Readings in the Humanities and the Social Sciences**

★3 (fi 6) (either term, 3-0-0). Writings in the Chinese humanities and social sciences by modern scholars. Prerequisite: CHINA 302.

**CHINA 414 Readings in Traditional Vernacular Literature**

★3 (fi 6) (either term, 3-0-0). Designed to familiarize the students with both language and the literary conventions used in fiction and drama. Prerequisite: CHINA 302.

**CHINA 423 Survey of Classical Chinese Poetry**

★3 (fi 6) (either term, 3-0-0). Readings in classical Chinese poetry with emphasis on tradition, form and technique. Readings and lectures in English. Prerequisite: Any 300-level literature course.

**CHINA 425 Survey of 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.

**CHINA 429 Translation: Chinese to English I**

★3 (fi 6) (either term, 3-0-0). Theory and practice of translation. Prerequisite: CHINA 407 and/or 408 or consent of Department.

**CHINA 441 Classical Chinese I**

★3 (fi 6) (first term, 3-0-0). Continuing study of the syntactic, lexical and stylistic forms used in classical Chinese texts. Prerequisite: CHINA 342.

**CHINA 442 Classical Chinese II**

★3 (fi 6) (second term, 3-0-0). A continuation of CHINA 441. Prerequisite: CHINA 441.

**CHINA 451 Topics in Early Fiction**

★3 (fi 6) (either term, 3-0-0). A critical analysis of form and themes in pre-1911 fiction. Lectures and readings in Chinese. Prerequisite: consent of Department.

**CHINA 452 Topics in Modern Literature**

★3 (fi 6) (either term, 3-0-0). A critical study of topics chosen from contemporary prose, poetry, and drama. Lectures and readings in Chinese. Prerequisite: consent of Department.

**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. Lectures and readings in Chinese. Prerequisite: CHINA 302.

**CHINA 481 Supervised Reading in Chinese I**

★3 (fi 6) (either term, 3-0-0). Accelerated reading course primarily for senior or graduate students in special areas of need or interest. Prerequisite: Written consent of Department.

**CHINA 482 Supervised Reading in Chinese II**

★3 (fi 6) (either term, 3-0-0). Further accelerated reading for senior and graduate students. Prerequisite: Written consent of Department.

**Graduate Courses****CHINA 501 Methods of Research: Pre-Modern**

★3 (fi 6) (first 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) (second term, 3-0-0). Sinology; historical and critical approaches to modern Chinese literature. A reading knowledge of Chinese is required.

**CHINA 551 Topics in Traditional Chinese Fiction**

★3 (fi 6) (either term, 3-0-0). A critical analysis of form and themes in pre-1911 fiction. A reading knowledge of Chinese is required.

**CHINA 552 Topics in Modern Chinese Literature**

★3 (fi 6) (either term, 3-0-0). Major literary trends and contemporary literature from post-Mao China and Taiwan. Lectures and readings in Chinese.

**CHINA 554 Topics in Classical Chinese Poetry**

★3 (fi 6) (either term, 3-0-0). Readings in classical Chinese Poetry with emphasis on tradition, form and technique. Readings in Chinese.

**CHINA 555 Topics in Classical Chinese Prose**

★3 (fi 6) (either term, 3-0-0). Readings in classical Chinese prose with emphasis on tradition, form and technique. Readings in Chinese.

**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.

**201.36 Christian Theology at St Joseph's College, CHRTC**

St Joseph's College

Note: The following courses can be used as Arts options.

**Undergraduate Courses****CHRTC 100 The Bible and the Origins of the Christian Church**

★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.

**CHRTC 172 Introduction to Catholic Moral Thought**

★3 (fi 6) (either term, 3-0-0). An introduction to the 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. Formerly CHRTC 272.

**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.

**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.

**CHRTC 266 Jesus in the New Testament**

★3 (fi 6) (either term, 3-0-0). Exploring the person of Jesus through studying the four Gospels, Paul, and later New Testament writers, with reflection on such recent approaches as liberation theology, feminist exegesis, and the Jesus-seminar.

**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.

**CHRTC 292 Spirituality for Today's Christian**

★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.

**CHRTC 296 History of the Church from its Beginning to Luther**

★3 (fi 6) (either term, 3-0-0). A survey of the development of the Church and of its influence on society from its beginning to the Reformation.

**CHRTC 297 The History of Christianity**

★3 (fi 6) (either term, 3-0-0). A lecture and discussion course about the

development of one of the leading religious traditions in the world. Not open to students who have successfully completed HIST 297.

**CHRTC 298 History of the Church from the Reformation to the Present**

★3 (fi 6) (either term, 3-0-0). A survey of the development of the Church and its influence on society from the Protestant and Catholic Reformations until the present.

**CHRTC 340 The Reformation: Conflict in the Church in the Sixteenth Century**

★3 (fi 6) (either term, 3-0-0). An historical study of the sources and consequences of the Protestant and Catholic Reformations. Note: consent of the College required for students with credit in HIST 404. Not to be taken by students with credit in CHRTC 344.

**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.

**CHRTC 342 The Early Church**

★3 (fi 6) (either term, 3-0-0). Historical development of the early Church and its institutions until the establishment of the papal states in the eighth century.

**CHRTC 343 The Medieval Church**

★3 (fi 6) (either term, 3-0-0). Historical development of the Church and its institutions from the time of Charlemagne until the Council of Trent in the 16th century.

**CHRTC 345 The Church in the Age of Reason and Revolution**

★3 (fi 6) (either term, 3-0-0). An historical study of the Church's struggle with revolution, secularism, liberalism, nationalism, and scientism from the 17th to the 19th centuries: the missionary expansion of the Church. Note: Not to be taken by students with credit in CHRTC 346.

**CHRTC 347 The Church in the Modern Age**

★3 (fi 6) (either term, 3-0-0). An historical study of the Church's struggle in the 20th century with political and social movements such as industrialization, modernism, democratization, totalitarianism.

**CHRTC 348 The Church in Canada**

★3 (fi 6) (either term, 3-0-0). An historical study of the Church in Canada from colonialization until the present.

**CHRTC 349 Christianity and Social Justice 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.

**CHRTC 350 Science and Religion: Christian Perspectives**

★3 (fi 6) (either term, 3-0-0). An examination of science and religion; their historical relationship, current issues (e.g., the evolution vs creation debate, scientific and religious knowledge, the nature of science and religion, cosmology) and contemporary attempts to address them.

**CHRTC 351 Human Sexuality and Marriage: Christian Perspectives**

★3 (fi 6) (either term, 3-0-0). Questions of meaning and morality concerning human sexuality and marriage, including love, non-marital sex, divorce, parenthood, and gender roles, considered in light of human experience. Scripture, Christian Tradition, Catholic Church teaching, and contemporary theological discussion.

**CHRTC 352 Bioethical Questions: Christian Perspectives**

★3 (fi 6) (either term, 3-0-0). Reproductive and genetic technologies, abortion, transplantation, resource allocation, human research, withdrawing treatment, personal directives.

**CHRTC 353 Christian Perspectives on Imaginative Literature**

★3 (fi 6) (either term, 3-0-0). The author's milieu, context of the work, Christian content, and how the work deals with Christian values, beliefs, spirituality, conscience.

**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. Not open to students with credit in CHRTC 355 or 356 or 357.

**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 New Catechism, and the relationship between an official Catechetical text and Catholic theological development.

**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.

**CHRTC 357 Catholic Educational Administration: Ethical Questions**

★3 (fi 6) (either term, 3-0-0). Servant leadership, faith development, intrinsic dignity of students, teachers and parents, discipline, evaluation and community building. Emphasis on integration of Christian values within an educational setting.

**CHRTC 358 John the Evangelist and His School**

★3 (fi 6) (either term, 3-0-0). An introduction to the themes and structure of the fourth Gospel, the development of the Church evidenced in John's letters, and the place of the Book of Revelation in the Christian life.

**CHRTC 359 Adolescent Sexuality: Perspectives in Christian Education**

★3 (fi 6) (either term, 3-0-0). Abortion, gender roles and expectations, homosexuality, premarital intercourse, teen pregnancy, rape, sexual abuse, sexually transmitted diseases, and single parenthood. This course will give students opportunities for participation in the presentation of the Christian values and human sexuality component of the CALM program in local secondary schools.

**CHRTC 362 The Hebrew Bible as a Theological Source**

★3 (fi 6) (either term, 3-0-0). A study of the Hebrew Scriptures (Old Testament), their relationship to the Christian Scriptures (New Testament), and their use in Christian theology.

**CHRTC 371 The Sacraments**

★3 (fi 6) (first term, 3-0-0). The role of the sacraments in Christian life and worship. The sacraments as mysteries of salvation and as community celebrations. Relationships among the various sacraments. Historical development and current understandings of specific sacramental rites.

**CHRTC 372 The Eucharist in Christian Worship**

★3 (fi 6) (either term, 3-0-0). A theological study of the development of Catholic Eucharistic liturgy from Jewish foundations to the present. The meaning of the Eucharist. Contemporary theological developments in the liturgy in theory and practice.

**CHRTC 379 Eastern Christian Churches in Communion with Rome**

★3 (fi 6) (either term, 3-0-0). An introduction to the theology and liturgy of Eastern Christianity in communion with Rome with special attention to the Ukrainian Church.

**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: the presence of God, a sense of belonging, the need for community. Prayer, scripture, liturgical celebration and sacraments, the church as faith community, and social responsibility in relation to the child's life experience.

**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: the life and teachings of Jesus, the challenge of the Good News in our culture, and the meaning of belonging and commitment to Church. The roles of school, family, and parish in religious education and the development of a faith nurturing school culture. Curriculum related areas of study include Christ, scripture, sacrament, church, morality, and social responsibility.

**CHRTC 392 Women's Perspectives and Catholic Theology**

★3 (fi 6) (either term, 3-0-0). The influence of various women's perspectives on the development of Catholic thought and action in the 20th century.

**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.

**CHRTC 396 Environmental Issues: Christian Perspectives**

★3 (fi 6) (either term, 3-0-0). A theological study of ethical issues concerning our human relationship to the planet earth: responsible stewardship, non-renewable resources, pollution, the use of technology.

**CHRTC 398 Christianity and Modern Spiritual Movements**

★3 (fi 6) (either term, 3-0-0). A theological examination of such modern responses to the Christian calling as Charismatic Renewal, Marriage Encounter, movements of justice and liberation, and of such contemporary expressions of the search for spiritual meaning as Creation Spirituality, New Age.

**CHRTC 400 Topics in Christian Theology**

★3 (fi 6) (either term, 3-0-0). Prerequisite: CHRTC 264 or consent of the College.

**CHRTC 401 Topics in Moral Theology**

★3 (fi 6) (either term, 3-0-0). Prerequisite: One of CHRTC 172, 351, 352, or consent of the College.

**CHRTC 403 Topics in Christian Spirituality**

★3 (fi 6) (either term, 3-0-0). Prerequisite: CHRTC 292 or consent of the College.

**CHRTC 404 Topics in Christian Liturgy**

★3 (fi 6) (either term, 3-0-0). Prerequisite: One of CHRTC 371, 372, 379, or consent of the College.

**CHRTC 405 Topics in Biblical Theology**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: One of CHRTC 100, 266, 362, or consent of the College.

**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.

**CHRTC 408 Vatican Council II**

★3 (*fi 6*) (either term, 3-0-0). An examination of the origin and teachings of the Second Vatican Council (1962-65): subsequent changes in the thought and life of the Catholic community. Prerequisite: CHRTC 264, or 270, or consent of the College.

**CHRTC 410 Modern Catholic Theologians**

★3 (*fi 6*) (either term, 3-0-0). An exploration of the efforts of recent Catholic theologians to relate Christian beliefs to modern culture. Prerequisite: One course in Christian theology or consent of the College.

**CHRTC 411 Topics in Christian Unity**

★3 (*fi 6*) (either term, 3-0-0). An examination of selected aspects of inter-Church dialogues in the 20th century and the efforts to recover the unity-within-diversity of Christianity. Prerequisite: One course in Christian theology or consent of the College.

**CHRTC 431 Issues in the Theology of Sexuality**

★3 (*fi 6*) (either term, 3-0-0). A theological study of selected issues such as the sacramentality of human sexuality, embodiment, sex education, reproduction, marriage. Prerequisite: CHRTC 351 or consent of the College.

**CHRTC 432 Advanced Bioethics**

★3 (*fi 6*) (either term, 3-0-0). A theological analysis of selected bioethical issues such as defective newborns, allocation of scarce medical resources, suffering and death. Prerequisite: CHRTC 352 or consent of the College.

**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.

**Note:** For philosophy courses offered by St Joseph's College, see Philosophy listing (from within the Roman Catholic Tradition) St Joseph's College.

## 201.37 Christian Theology at St Stephen's College, CHRTP

St Stephen's College

**Note:** The following courses can be used as Arts options.

### Undergraduate Courses

**CHRTP 301 Hebrew Scriptures**

★3 (*fi 6*) (first term, 3-0-0). Background, authorship, sources, literary qualities and general teaching of the various books of the Hebrew Scriptures (Old Testament), and the process of the Old Testament formation. Note: Not open to students with credit in CHRTP 301 Old Testament Literature.

**CHRTP 305 Christian Scriptures**

★3 (*fi 6*) (second term, 3-0-0). Jewish and Greek environment of the New Testament; the authorship and content of its various books, and the process of New Testament formation. Note: Not open to students with credit in CHRTP 305 New Testament Literature.

**CHRTP 312 The Question of Faith**

★3 (*fi 6*) (first term, 0-3s-0). An introduction to a methodology for a disciplined examination of issues in contemporary religious experience with reference to selected readings from leading thinkers.

**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 the theological reflection and commitment. Particular attention will be paid to the development of debate within the Protestant tradition.

**CHRTP 314 Topics in Women and Religion**

★3 (*fi 6*) (either term, 3-0-0). Women's relation to and place in the dominant religious tradition of the West, Christianity. Attention will be paid to women's attempts to critique and transform received tradition and/or to develop alternative forms of religious life.

**CHRTP 315 Topics in Religion and Literature**

★3 (*fi 6*) (either term, 3-0-0). Religious systems mediate their values and concerns in a variety of ways (liturgy, mythos, theology, etc.). This course investigates major Christian concerns such as doubt, faith, suffering, hope, forgiveness and redemption as mediated through narrative. In addition to exploring deep questions of religious meaning, attention will also be paid to the transmission and transformation of values, and the use of literature as a religious vehicle for social change.

**CHRTP 316 Issues in Contemporary Sexuality and Spirituality**

★3 (*fi 6*) (second term, 2-1s-0). A study of selected beliefs concerning sexuality and spirituality in the light of contemporary theories and debates.

**CHRTP 317 New Issues in Theology**

★3 (*fi 6*) (either term, 3-0-0). A survey course exploring recent developments in Christian Theology and their implications for traditional beliefs, symbols, and the integration of faith and practice.

**CHRTP 318 Feminist Theology**

★3 (*fi 6*) (first term, 1-2s-0). An examination of feminist criticisms of selected doctrines and practices.

**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.

## 201.38 Civil Engineering, CIV E

Department of Civil and Environmental Engineering  
Faculty of Engineering

The following courses were renumbered effective 1993/94:

Old	New	Old	New
CIV E 305	CIV E 290	CIV E 431	CIV E 331
CIV E 350	CIV E 250	CIV E 451	CIV E 355
CIV E 351	CIV E 251	CIV E 452	CIV E 356
CIV E 360	CIV E 270	CIV E 480	CIV E 381
CIV E 401	CIV E 391	CIV E 500	CIV E 490
CIV E 402	CIV E 405	CIV E 507	CIV E 407
CIV E 409	CIV E 303	CIV E 572	CIV E 474
CIV E 430	CIV E 330	CIV E 590	CIV E 481

The following courses were renumbered effective 1994/95:

Old	New	Old	New
CIV E 220	CIV E 221	CIV E 393	CIV E 395
CIV E 291	CIV E 398	CIV E 394	CIV E 295
CIV E 333	CIV E 433	CIV E 420	CIV E 421
CIV E 370	CIV E 372	CIV E 473	CIV E 374

### 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. (★3)

**CIV E 250 Plane Surveying**

□4 (*fi 6*) (either term, 3-0-2). 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. (★3)

**CIV E 251 Survey School**

□2 (*fi 6*) (second term or Spring/Summer, 2 weeks). 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. (★3)

**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. (★3)

**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. (★3)

**CIV E 290 Civil Engineering Analysis I**

□3 (*fi 6*) (second term, 3-0-0). Statistical and probabilistic approaches to civil engineering problems. Prerequisites: ENCOMP 100, MATH 101. (★3)

**CIV E 295 Civil Engineering Analysis II**

□4 (*fi 6*) (second term, 3-0-2). Application of numerical methods to civil engineering problems. Prerequisites: ENCOMP 100, MATH 102 and 209. (★3)

**CIV E 303 Project Management**

□3.8 (*fi 6*) (first term, 3-0-3/2). Planning and scheduling; theories and techniques of project management. (★3)

**CIV E 312 Transportation Engineering**

□3.8 (fi 6) (either term, 3-0-0). Transportation systems and their elements. Population and transportation in Canada. Principles of transportation planning. Traffic volume, capacity, speed, density, and safety. Fundamentals of traffic control and public transport. Economic and environmental evaluation in transportation planning and operations design. Principles of transportation systems management (★3)

**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. (★3)

**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. (★3)

**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 and 221. (★3)

**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. (★3)

**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. (★3)

**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. Prerequisites: EAS 210 and CIV E 295. Corequisites: CIV E 330, 395, CIV E 391 or ENV E 351. (★3)

**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: MATE 252. (★3)

**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 201 and CIV E 295. (★3)

**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. (★3)

**CIV E 404 Construction Methods**

□3.8 (fi 6) (either term, 3-0-3/2). 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. Prerequisite: CIV E 372. (★3)

**CIV E 405 Construction Materials and Methods**

□4.5 (fi 6) (first term, 3-0-3). Introduction to the elements and methods of building construction. Foundations, structural framing, floor and roof systems, wall assemblies, utilities and finishes. Influence of materials. (Field trips and incidental fee required.) Prerequisite: consent of Department (★3)

**CIV E 412 Highway Engineering**

□3.8 (fi 6) (either term, 3-0-3/2). 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. Prerequisites: CIV E 312, 250 and 391. (★3)

**CIV E 421 Processes for Public Health and Environmental Protection**

□3.8 (fi 6) (either term, 3-0-3/2). Theory of chemical, physical and biological processes in environmental engineering. Chemical kinetics and equilibrium, biological growth and kinetics, elements of reactor design, sedimentation, filtration, absorption; precipitation and gas transfer, introduction to facility design. Prerequisite: CIV E 221. (★3)

**CIV E 433 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, contaminant transport and urban runoff quality. Prerequisite: CIV E 321. (★3)

**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. (★3)

**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. (★3)

**CIV E 490 Civil Engineering Report Writing**

□2 (fi 6) (either term, 1-2s-0). Written and oral communication; lectures and practice on presentation of oral and written reports. A comprehensive written report must be submitted by each student. Prerequisite: consent of Department. (★3)

**CIV E 506 Construction Estimating, Planning, and Control**

□3 (fi 6) (second term, 3-0-0). 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. (★3)

**CIV E 511 Traffic Engineering and Planning**

□3 (fi 6) (second term, 3-0-0). Principles and measurements of traffic flow. Quality of service. Traffic control. Transportation demand studies, traffic impact analysis. Computer applications. Prerequisite: CIV E 211. (★3)

**CIV E 521 Environmental Engineering Design**

□3 (fi 6) (second term, 3-0-0). Fundamentals of municipal design, planning and environmental impact assessment; solid waste management; detailed design and assessment projects; reports; presentations; field trips. Prerequisites: CIV E 221, 321, and 421. (★3)

**CIV E 531 Environmental Fluid Mechanics**

□4 (fi 6) (second term, 3-0-2). Turbulent flow; equations of motion and pollutant conservation equation; slender flows, jets and plumes. Mixing processes in rivers and lakes. Hydraulics of hot water and effluent discharges into water bodies. Oil spills in rivers and ocean. Prerequisite: CIV E 331. (★3)

**CIV E 540 Hydraulic Engineering**

□3 (fi 6) (second term, 3-0-0). Theory and design of hydraulic structures like dams, spillways, energy dissipators, drop structures, weirs, and culverts. Elementary river engineering including backwater curve computations. Hydraulic transients. Prerequisite: CIV E 331. (★3)

**CIV E 574 Structural Design III**

□3 (fi 6) (second term, 3-0-0). Design of prestressed concrete structures; masonry and reinforced masonry elements; timber structures; fatigue life of steel structures and cold formed steel elements. Prerequisites: CIV E 374 and 474. (★3)

**CIV E 591 Geotechnical Design**

□3 (fi 6) (second term, 3-0-0). Evaluation of site conditions. Design and analysis of shallow and deep foundations and retaining structures. Slope stability of embankments and cuts including foundation excavations. Prerequisite: CIV E 481. (★3)

**CIV E 592 Civil Engineering Applications of Operations Research**

□3 (fi 6) (either term, 3-0-0). Introduction to basic concepts of systems analysis, operations research, and decision-making as applied to civil engineering problems. Prerequisite: CIV E 290. (★3)

**CIV E 598 Special Topics in Civil Engineering I**

□3 (fi 6) (either term, 3-0-0). (★3)

**Graduate Courses****CIV E 602 Construction Administration**

□3 (fi 6) (either term, 3-0-0). Administration of construction projects: financial control, advanced estimating, ratio analysis, cost control structures, cost planning and control, data collection and reporting, integrated project management, bid evaluation and risk analysis. (★3)

**CIV E 603 Computer Applications and Information Management in Construction**

□4.5 (fi 6) (either term, 3-0-3). Application of computers to the planning, organization, and control of construction projects. Computer-aided process control. Strategies for software and hardware organization. Computer-aided information management in construction. (★3)

**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. (★3)

#### **CIV E 605 Advanced Project Planning and Control**

□3 (*fi 6*) (either term, 3-0-0). Advanced techniques used for project planning and control, applications of operations research to construction management, case studies, and applications. (★3)

#### **CIV E 606 Design and Analysis of Construction Operations**

□3 (*fi 6*) (either term, 3-0-0). Application of discrete event process simulation to the design and analysis of construction systems. Introduction to CYCLONE and SLAM II simulation languages. Emphasis on modeling construction technologies including heavy and highway construction technologies, building construction, underground tunnelling, and trenchless excavation. (★3)

#### **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. (★3)

#### **CIV E 608 Construction Engineering I**

□3 (*fi 6*) (either term, 3-0-0). Introduction to the elements and methods of construction and principles of material handling on construction projects. Covers earthmoving, piling, asphalt production and laying, concrete production and transportation, lifting, formwork, building systems, modular construction, pipeline construction. Includes site tours. This will be a three-hour session with a P/F mark. (★3)

#### **CIV E 609 Construction Engineering II**

□3 (*fi 6*) (either term, 3-0-0). Principles of construction engineering. Structural analysis and design for construction including approximate analysis, codes, and computer methods. Design and analysis of temporary structures, formwork and shoring, false work, hoisting and rigging cranes and lifting equipment. Case studies include bridge erection schemes, cambering of girders, and stochastic analysis. (★3)

#### **CIV E 610 Pavement Design**

□3 (*fi 6*) (either term, 3-0-0). Pavement performance and evaluation; stresses and displacements in layered systems; theories and principles of flexible and rigid pavement design and construction; rehabilitation of pavements and cost analysis. (★3)

#### **CIV E 611 Pavement Materials**

□3 (*fi 6*) (either term, 3-0-0). Source, manufacture, properties, tests and specifications of bituminous materials; properties and testing of aggregate, bituminous and stabilized mixtures; construction and quality control. (★3)

#### **CIV E 612 Transportation Design**

□3 (*fi 6*) (either term, 3-0-0). Introduction to all modes of transportation; principles of geometric design of transportation facilities including highways, railways, airports and parking terminals; economics of location. (★3)

#### **CIV E 613 Transportation Systems Analysis**

□3 (*fi 6*) (either term, 3-0-0). Urban and regional transport planning; travel demand forecasting; origin-destination analysis; trip distribution models; network analysis; economic principles in transportation; freight transport; strategy of transport planning. (★3)

#### **CIV E 614 Transportation Engineering**

□3 (*fi 6*) (either term, 3-0-0). Principles of traffic psychology; introduction to theory of traffic flow; traffic capacity of highways, interchanges and urban roads; traffic operations; traffic control devices and signal systems; principles of street illumination; principles of air traffic and railway traffic operations. (★3)

#### **CIV E 615 Functional Planning and Geometric Design**

□3.5 (*fi 6*) (either term, 2-0-3). Types of interchanges, network planning and other facets of functional planning, geometric design, merging and diverging movements, environmental and safety factors. (★3)

#### **CIV E 616 Public Transportation**

□3 (*fi 6*) (either term, 3-0-0). Public transport networks; population and transport network densities; traffic prediction and choice of transport mode; capacity and operating characteristics of various types of public transport; design characteristics of various transit systems; integration with urban planning. (★3)

#### **CIV E 617 Computer Applications in Transportation Engineering and Planning**

□3 (*fi 6*) (either term, 3-0-0). Computer modeling in transportation engineering. Application programs in traffic operations, urban transportation planning and transportation decision analysis. The course provides an opportunity to apply the concepts and modeling principles to practical situations and to acquire the necessary skills with a variety of programs used in transportation engineering research and practice. (★3)

#### **CIV E 620 Environmental Engineering Measurements I**

□4.5 (*fi 6*) (first 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. (★3)

#### **CIV E 621 Municipal Distribution and Collection Systems**

□3 (*fi 6*) (second term, 3-0-0). 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, loads on conduits are examined. Solid waste collection and processing systems. (★3)

#### **CIV E 622 Physical/Chemical Water and Wastewater Treatment**

□3 (*fi 6*) (first term, 3-0-0). Theory and design of chemical and physical unit processes utilized in the treatment of water and wastewater, sedimentation, flotation, coagulation, precipitation, filtration, disinfection, ion exchange, reverse osmosis, adsorption, and gas transfer. (★3)

#### **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. (★3)

#### **CIV E 624 Biological Waste Treatment Processes**

□3 (*fi 6*) (second 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. (★3)

#### **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. (★3)

#### **CIV E 626 Environmental Health Engineering**

□3 (*fi 6*) (either term, 3-0-0). Exposure assessment including environmental partitioning behavior of contaminants, and human exposure measurement, modelling and time-activity analysis. Health assessment including hazard identification, dose-response assessment, odour and noise assessment. Risk management. (★3)

#### **CIV E 627 Environmental Engineering Measurements II**

□3 (*fi 6*) (second 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. (★3)

#### **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. (★3)

#### **CIV E 630 Open Channel Flow**

□3 (*fi 6*) (either term, 3-0-0). Steady and unsteady flow in open channels. (★3)

#### **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. (★3)

#### **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. (★3)

#### **CIV E 633 Pipe Flow**

□3 (*fi 6*) (either term, 3-0-0). Steady and unsteady flow in pipe systems. Pipe networks. Slurry transport. Pump characteristics and pump-system interaction. Pipeline design. (★3)

#### **CIV E 634 Numerical Methods in Hydraulics**

□3 (*fi 6*) (either term, 3-0-0). Finite difference, finite element and boundary integral methods. Applications of these methods. (★3)

#### **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. (★3)

#### **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. (★3)

#### **CIV E 637 Coastal Engineering in Cold Regions**

□3.5 (*fi 6*) (either term, 3-0-1). Waves, tides and storm surges; estuarine hydraulics. Sea ice formation and processes. Interaction of waves and ice with structures. (★3)

**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. (★3)

**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. (★3)

**CIV E 642 Risk and Decision in Civil Engineering**

□3 (*fi 6*) (either term, 3-0-0). Analysis of data; models and solutions in respect to decision making for civil engineering problems such as quality control, safety of structures, traffic flow, transportation planning, watershed management, water supply, measurement theory, simulation, natural phenomena. (★3)

**CIV E 643 Porous Media Hydraulics**

□3.5 (*fi 6*) (either term, 3-0-1). Saturated and unsaturated flow: infiltration, percolation seepage, drainage and aquifer hydraulics. (★3)

**CIV E 650 Advanced Topics in Photogrammetry**

□3 (*fi 6*) (either term, 3-0-0). Specialized photogrammetric techniques for use in engineering and scientific measurements. Emphasis on close-range and terrestrial photogrammetry, self-calibration modeling and special adjustment techniques. (★3)

**CIV E 651 Advanced Topics in Surveying**

□3 (*fi 6*) (either term, 3-0-0). Study of modern survey techniques and their application. Emphasis on modern positioning systems, deformation monitoring, survey design and data analysis. (★3)

**CIV E 652 Advanced Topics in Data Analysis and Adjustment**

□3 (*fi 6*) (either term, 3-0-0). Study of data analysis techniques. Regression and adjustment procedures for photogrammetric, surveying and engineering applications. (★3)

**CIV E 653 Readings in Project Management**

□3 (*fi 6*) (first term, 3-0-0). Management of construction projects: organizational issues, advanced time management, total quality management, materials management, change control and management of change. (★3)

**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. (★3).

**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 predications, 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. (★3)

**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 speciality areas; analysis of experimental and survey data. (★3)

**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. (★3)

**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. (★3)

**CIV E 663 Design of Shell Structures**

□3 (*fi 6*) (either term, 3-0-0). (Offered alternate years.) Assumptions, derivation and limitations of shell theory as applied to the design of folded plate structures, storage structures consisting of shells of revolution; cylindrical and parabolic roof shells. Emphasis is placed on design problems. (★3)

**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. (★3)

**CIV E 665 Introduction to the Finite Element Method**

□3 (*fi 6*) (second 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. (★3)

**CIV E 666 Structural Concepts**

□4 (*fi 6*) (second term, 3-1s-1). Causes and characteristics of loads on buildings, bridges and other structures. Reasons for and calculations of load and resistance factors. (★3)

**CIV E 667 Advanced Topics in the Finite Element Method**

□3 (*fi 6*) (first term, 3-0-0). (Offered in alternate years.) Convergence criteria, equilibrium and hybrid elements. Application of finite element methods to problems in stability, dynamics, plates and shells. Treatment of geometric and material nonlinearities. Prerequisite: CIV E 665 or consent of Instructor. (★3)

**CIV E 670 Behavior and Design of Steel Members**

□4 (*fi 6*) (first 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. (★3)

**CIV E 671 Behavior and Design of Steel Structures**

□3 (*fi 6*) (second 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. (★3)

**CIV E 672 Behavior and Design of Concrete Members**

□4 (*fi 6*) (first 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. (★3)

**CIV E 673 Behavior and Design of Concrete Structures**

□3 (*fi 6*) (second 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. (★3)

**CIV E 674 Behavior and Design of Prestressed Concrete Structures**

□3 (*fi 6*) (second 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. (★3)

**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. (★3)

**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. (★3)

**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. (★3)

**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. (★3)

**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. (★3)

**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. (★3)

**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. (★3)

**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. (★3)

#### 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. (★3)

#### 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. (★3)

#### 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. (★3)

#### 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. (★3)

#### CIV E 696 Geotechnical Aspects in Highway Engineering

□3 (fi 6) (second term, 3-0-0). Terrain analysis for highway design, design and construction of highway embankments, quality control procedures, special treatments for soft foundations of embankments. Behavior of compacted soils under repeated loading, swelling subgrade soils. Admixture stabilization using Portland cement, lime, bituminous materials or other chemicals. (★3)

#### 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. (★3)

#### CIV E 698 Geotechnical Engineering of Oil Sands Development

□3 (fi 6) (either term, 3-0-0). Origin and distribution of oil sands; surficial geology, geomorphological setting and geology of oil sands deposits in Alberta; regional hydrogeology; material and geotechnical properties, and site investigation practice. Geotechnical engineering in surface mining projects; underground access projects; in situ recovery projects; plant site development, and development of infrastructures. (★3)

#### 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. (★3)

#### CIV E 709 Advanced Topics in Construction Engineering and Management

□3 (fi 6) (either term, 3-0-0). (★3)

#### CIV E 719 Advanced Topics in Transportation and Highway Engineering

□3 (fi 6) (either term, 3-0-0). (★3)

#### CIV E 729 Advanced Topics in Environmental Engineering

□3 (fi 6) (either term, 3-0-0). (★3)

#### CIV E 739 Advanced Topics in Fluid Mechanics and Hydraulics

□3 (fi 6) (either term, 3-0-0). (★3)

#### CIV E 749 Advanced Topics in Water Resources Engineering

□3.5 (fi 6) (either term, 3-0-1). Related Lab experiments. (★3)

#### CIV E 759 Special Topics in Civil Engineering

□3 (fi 6) (either term, 3-0-0). (★3)

#### CIV E 779 Advanced Topics in Structural Engineering

□3 (fi 6) (either term, 3-0-0). (★3)

#### CIV E 799 Advanced Topics in Soil Mechanics

□3 (fi 6) (either term, 3-0-0). (★3)

#### CIV E 900 Directed Research Project

★3 (fi 6) (variable, unassigned).

## 201.39 Classics, CLASS

Department of History and Classics  
Faculty of Arts

- (1) None of the courses under this heading will fulfil the language-other-than-English requirement of the BA degree.
- (2) All 200- and 300-level courses under this heading are survey courses designed primarily for the non-specialist and may be taken by students with no knowledge of Greek or Latin.
- (3) The Classics Department does not permit first-year students, regardless of their faculty, to take its 300-level courses. It permits only third- and fourth-year students, regardless of their faculty, to take its 400-level courses.
- (4) The courses numbered 460 through 500, are designed for fourth-year, Honors, and graduate students. No Greek or Latin is required at the 400-level, but may be required at the 500-level. 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 take these courses are expected to have at least one senior course in ancient history or literature; if they do not, they must obtain the consent of Department to their registration, and the Department will consider their special needs. Note: Details of the topics to be offered in any given year may be obtained from the Department. For additional related courses see Greek and Latin listings.
- (5) See also INT D 331 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

The following table lists renumbered courses effective 1996/97:

Old	New	Old	New
CLASS 141	CLASS 294	CLASS 361	CLASS 261
CLASS 201	CLASS 221	CLASS 363	CLASS 371
CLASS 250	CLASS 270	CLASS 364	CLASS 372
CLASS 251	CLASS 271	CLASS 367	CLASS 352
CLASS 349	CLASS 321	CLASS 368	CLASS 353
CLASS 350	CLASS 321	CLASS 369	CLASS 376
CLASS 351	CLASS 322	CLASS 370	CLASS 377
CLASS 357	CLASS 302		

#### □ 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. Formerly CLASS 202.

#### □ 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. Note: Students choosing CLASS 110 for partial fulfilment of the Humanities Group A requirement must also take one of HIST 110, 111 or 112. Formerly CLASS 210.

#### □ CLASS 160 Greek and Latin Etymology

★3 (fi 6) (either term, 3-0-0). A study of Greek and Latin words commonly used in English: how these words are built, and how they gain and change in meanings. Formerly CLASS 260.

#### □ 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. Formerly CLASS 201. May not be taken concurrently with or subsequent to CLASS 321/322.

#### □ CLASS 252 Ancient Art and Archaeology

★3 (fi 6) (either term, 3-0-0). An overview of the art and archaeology of Ancient Greece and/or Ancient Italy within its historical and social context.

#### □ 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. Formerly CLASS 361.

#### □ CLASS 270 Greek Civilization

★3 (fi 6) (either term, 3-0-0). An introduction to Greek social history illustrated by reference to contemporary literature and archaeological discoveries: the Bronze Age, rise of the city, trade and colonization, Athens, Sparta, and warfare. Formerly CLASS 250 (1990-91 through 1995-96). Prior to 1990-91 CLASS 250 was a junior-level course. If CLASS 250 was successfully completed prior to 1990-91, then CLASS 270 may be taken for credit. However, if CLASS 250 was successfully completed between 1990-91 through 1995-96, then CLASS 270 may not be taken.

**CLASS 271 Roman Civilization**

★3 (fi 6) (either term, 3-0-0). An introduction to Roman social history illustrated by reference to contemporary literature and archaeological discoveries. The course is organized thematically, covering such topics as family, education, law, government, agriculture, and entertainment. Formerly CLASS 251 (1990-91 through 1995-96). Prior to 1990-91 CLASS 251 was a junior-level course. If CLASS 251 was successfully completed prior to 1990-91, then CLASS 271 may be taken for credit. However, if CLASS 251 was successfully completed between 1990-91 through 1995-96, then CLASS 271 may not be taken.

**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. Not available for those who have successfully completed CLASS 141.

**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; modern scholarship. Formerly CLASS 357. Prerequisite: CLASS 102 or consent or Department.

**CLASS 321 Greek Literature in Translation**

★3 (fi 6) (either term, 3-0-0). A study of representative works of Greek literature. Formerly CLASS 349/359.

**CLASS 322 Latin Literature in Translation**

★3 (fi 6) (either term, 3-0-0). A study of representative works of Latin literature. Formerly CLASS 351.

**CLASS 352 Greek Art**

★3 (fi 6) (either term, 3-0-0). The origin and development of Greek Art and Architecture and its relation to, and reflection of, the cultural and political history of the times. Formerly CLASS 367. Prerequisite: CLASS 102, or any 200- or 300-level CLASS course, or consent of Department.

**CLASS 353 Roman Art**

★3 (fi 6) (either term, 3-0-0). The development and role of Art and Architecture in the Hellenistic kingdoms and the Roman Republic; the evolution of Roman Imperial Art. Formerly CLASS 368. Prerequisite: CLASS 102, or any 200- or 300-level CLASS course, or consent of Department.

**CLASS 365 Early Roman History**

★3 (fi 6) (either term, 3-0-0). The origins and rise of Roman power to 133 BC, with special attention to the influence of Etruscan civilization, the wars with Carthage and the beginnings of Roman imperialism.

**CLASS 366 History of the Later Roman Republic**

★3 (fi 6) (either term, 3-0-0). The crisis of the Roman Republic (133 - 44 BC), considered in the light of imperial expansion in the Mediterranean, with special attention to the careers of Marius, Sulla, Pompey, and Julius Caesar.

**CLASS 371 History of Ancient Greece I**

★3 (fi 6) (either term, 3-0-0). The Hellenic world from its beginnings in the Bronze Age until the Persian Wars, with special attention to the organization of the city state, Sparta, and the rise of Athenian democracy. Formerly CLASS 363.

**CLASS 372 History of Ancient Greece II**

★3 (fi 6) (either term, 3-0-0). The Hellenic world from the Persian Wars, including the Athenian Empire, the Peloponnesian War, the various hegemonies in the 4th century to the death of Alexander the Great. Formerly CLASS 364.

**CLASS 373 History of Ancient Greece III**

★3 (fi 6) (either term, 3-0-0). The Hellenistic World from the death of Alexander the Great to 30 BC, with special attention to Alexander's successors and the development of the Hellenistic kingdoms.

**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. Normally offered in Spring/Summer.

**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. Formerly CLASS 369.

**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. Formerly CLASS 370.

**CLASS 378 History of the Roman Empire I**

★3 (fi 6) (either term, 3-0-0). The Roman Empire from Augustus to the Antonines, including the Julio-Claudian emperors, the Flavian dynasty and the rise of provincialism, and the Pax Romana of the 2nd century. Not open to students with credit in CLASS 374.

**CLASS 379 History of the Roman Empire II**

★3 (fi 6) (either term, 3-0-0). The Roman Empire from the Severans to the Fall

of Rome, including the crisis of the 3rd century, the Tetrarchy, and the Christian Empire of Constantine and his successors. Not open to students with credit in CLASS 374.

**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 399 Topics in the Ancient World**

★3 (fi 6) (either term, 3-0-0).

**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.

**CLASS 460 Topics in Ancient Near Eastern History**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: Any one of CLASS 372, 376 (formerly 369, 370) or consent of Department.

**CLASS 461 Topics in Roman Imperial History**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: Any one of CLASS 378, 379, or consent of Department.

**CLASS 463 Topics in Roman Republican History**

★3 (fi 6) (either term, 0-3s-0). Prerequisites: Any one of CLASS 365, 366 or consent of Department.

**CLASS 464 Introduction to Roman Civil Law**

★3 (fi 6) (either term, 3-0-0). Traces the development of the Roman system of civil law while examining the reasoning of Roman jurists.

**CLASS 473 Topics in Classical Archaeology**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: Any one of CLASS 371, 372, 352 or consent of Department.

**CLASS 475 Practical Methods in Classical Archaeology**

★3-6 (variable) (variable, 0-10L-0). The techniques of excavation and recording in Classical Archaeology. Note: Offered only for field work in the archaeology of the Greek and Roman world and restricted to those participating in an excavation sponsored by the Department. Prerequisites: Any 300-level CLASS, GREEK, or LATIN course and consent of Department.

**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 and consent of Department. Note: Offered in summer only for field work in the archaeology of the Greek and Roman world and restricted to those participating in an excavation sponsored by the Department.

**CLASS 477 Topics in Greek Art**

★3 (fi 6) (either term, 0-3s-0). In-depth study of aspects of Greek art. Prerequisite: CLASS 352 or consent of Instructor.

**CLASS 478 Topics in Roman Art**

★3 (fi 6) (either term, 0-3s-0). In-depth study of aspects of Roman art. Prerequisite: CLASS 353 or consent of Department.

**CLASS 480 Topics in the Archaeology of the Roman Provinces**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: Any of CLASS 353, 378, 379, or consent of Department.

**CLASS 489 Topics in Classical Literature**

★3 (fi 6) (either term, 0-3s-0).

**CLASS 497 Topics on Women in Classical Antiquity**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: Any 300-level course in Classics or any 300-level cross-listed course in Women's Studies, or consent of Department.

**CLASS 498 Individual Study of Literary Problems**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: Any one of CLASS 261, 321, 322, 351, or consent of Department.

**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 511 Topics in the Iron Age in Italy**

★3 (*fi 6*) (either term, 0-3s-0). The native cultures of the Italian peninsula from the beginning of the first millennium BC until the end of the Samnitic wars. Prerequisite: consent of Department.

**CLASS 512 Topics in the Archaeology of Magna Graecia**

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

**CLASS 513 Topics in the Archaeology of Roman Italy**

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

**CLASS 514 Topics in the Archaeology of Egypt and the Ancient Near East**

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

**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 525 Topics in Greek and Latin Literature**

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

**CLASS 601 Studies in Classical Archaeology I**

★3 (*fi 6*) (either term, 0-3s-0).

**CLASS 602 Studies in Classical Archaeology II**

★3 (*fi 6*) (either term, 0-3s-0).

**CLASS 699 Conference Course (Thesis)**

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

**CLASS 900 Directed Research Project**

★6 (*fi 12*) (variable, unassigned).

## 201.40 Community Health, CO ME

Department of Public Health Sciences  
Faculty of Medicine and Dentistry

**Note:** CO ME courses are open to MD students only.

### Undergraduate Courses

**CO ME 431 Public Health, Prevention, and Health Promotion**

★1 (*fi 2*) (first term, 13 hours). This course will develop an understanding of the philosophy of public health and will involve the application of the theoretical framework underlying public health and health promotion to local public health problems.

**CO ME 432 Occupational and Environmental Health**

★1 (*fi 2*) (two term, 13 hours). This is a self-contained course in the common and important disorders associated with exposures in the work place, the appropriate assessment of fitness to work and of functional impairment, and the role of the physician in identifying and managing occupational health problems. These situations are common in most specialities treating adults and often raise difficult questions of science, clinical management, and ethics.

## 201.41 Comparative Literature, C LIT

Department of Comparative Literature, Religion, and  
Film/Media Studies  
Faculty of Arts

**Note:** Courses in Comparative Literature teach a number of literatures from an international perspective with the help of translations as necessary.

### Undergraduate Courses

**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.

**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.

**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.

**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.

**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.

**C LIT 205 Introduction to Literary Theory**

★6 (*fi 12*) (two term, 3-0-0). Survey of traditional modes of criticism and such theories as new criticism, formalism, structuralism, deconstruction, reader response, translation theory, marxism, feminism, queer theory, and postcolonialism.

**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).

**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.

**C LIT 320 Introduction to Medieval Literature**

★3 (*fi 6*) (either term, 3-0-0). An introduction to the European epic, romance, lyric, and drama of the Middle Ages.

**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.

**C LIT 342 Introduction to 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.

**C LIT 343 Introduction to 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.

**C LIT 344 Introduction to 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.

**C LIT 345 Introduction to 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.

**C LIT 346 Introduction to 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.

**C LIT 352 Introduction to Relations Between 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.

**C LIT 357 Modern Middle Eastern Literature**

★3 (*fi 6*) (either term, 3-0-0). A survey of trends in modern Arabic, Persian and Turkish literature.

**C LIT 358 Introduction to 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.

**C LIT 360 Marginalized Literatures**

★3 (*fi 6*) (either term, 3-0-0). An introduction to literatures of minorities and lesser known national literatures.

**C LIT 362 International Movements in Contemporary Literature**

★3 (*fi 6*) (either term, 3-0-0). This course is designed to introduce the student to such topics as literature of the absurd, existential literature, and surrealism.

**C LIT 363 Introduction to Comparative Latin American and Caribbean Literature**

★3 (*fi 6*) (either term, 3-0-0). An introduction to Latin American and Caribbean Literature of the twentieth century, produced originally in Spanish, Portuguese, French, English, or Dutch.

**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.

**0 C LIT 415 East Asian and European Literary Relations**

★3 (*fi 6*) (either term, 3-0-0). A comparative examination of East Asian and European literary relations from the time of the decline of ancient civilization and the early middle ages to modern times.

**0 C LIT 440 Comparative Studies in Popular Culture**

★3 (*fi 6*) (either term, 3-0-0). An international historical and typological introduction to the main kinds of popular literature and media, their changing status in society and culture, as well as their interaction with canonized forms of literature and the arts.

**0 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.

**0 C LIT 447 Principles of Literary Interpretation**

★3 (*fi 6*) (either term, 3-0-0). An introduction to the principles, problems, and practices of the interpretation of literary texts.

**0 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.

**0 C LIT 450 Introduction to the Western Tradition in Literary Criticism III**

★3 (*fi 6*) (either term, 3-0-0). An international survey of the major developments in Western literary criticism from the later 19th century to the present.

**0 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.

**0 C LIT 465 Literature and Society**

★3 (*fi 6*) (either term, 3-0-0). International comparative studies of the interrelationship of literature and society.

**0 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.

**0 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.

**0 C LIT 475 Advanced Studies in Medieval Literature**

★3 (*fi 6*) (either term, 3-0-0). An advanced study of the major kinds of medieval literature within a European context.

**0 C LIT 497 Special Studies in Comparative Literature I**

★3 (*fi 6*) (either term, 0-3s-0).

**0 C LIT 499 Honors Tutorial and Essay**

★3 (*fi 6*) (second term, 0-3s-0). Preparation of the Honors Essay.

## Graduate Courses

**0 C LIT 501 Studies in World Literature I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 502 Studies in World Literature II**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 504 Studies in the Relationship of Literature with the Visual Arts**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: One senior-level course in art history, one senior-level course in literature, and reading knowledge of one relevant language other than English. Corequisite: ART H 504.

**0 C LIT 505 The Theory of the Study of Literature**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 506 Topics in Critical Discourse**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 509 Topics in Marginalized Literature**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 511 Comparative Studies in Formalistic Approaches to Literature**

★3-5 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 513 Poststructuralist Theory**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 514 Literature and Oral Tradition**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: Reading knowledge of any relevant ancient or modern language other than English.

**0 C LIT 519 Comparative Studies in the Asian and Western Tradition**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English (e.g. German, French).

**0 C LIT 521 Directed Reading Course I**

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

**0 C LIT 522 Directed Reading Course II**

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

**0 C LIT 523 Studies in Foundational Texts**

★3 (*fi 6*) (either term, 3-0-0). Advanced studies in religious and literary texts which are the foundation of different cultures. The syllabus of the course will vary from year to year and reflect religious, literary, and cultural perspectives; the modular teaching units will include selected texts in the original language and in translation. Prerequisite: consent of Department.

**0 C LIT 545 Comparative Studies in 18th-Century Literature**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 547 Studies in Western Tradition in Literary Criticism I**

★3 (*fi 6*) (either term, 3-1s-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 548 Studies in Western Tradition in Literary Criticism II**

★3 (*fi 6*) (either term, 3-1s-0). Prerequisite: C LIT 547 or consent of Department.

**0 C LIT 549 Studies in Western Tradition in Literary Criticism III**

★3 (*fi 6*) (either term, 3-1s-0). Prerequisite: C LIT 548 or consent of Department.

**0 C LIT 550 Comparative Studies in Romantic Literature**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 552 Comparative Studies in Realistic Literature**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 553 Comparative Studies in Naturalistic Literature**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 554 Comparative Studies in the Novel**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 556 Advanced Studies in Comparative Colonial and Post-Colonial Literatures**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English, or consent of Department.

**0 C LIT 557 Symbolism as an International Movement**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 560 Comparative Studies in Canadian Literature**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 575 Tragedy: A Theoretical Approach**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 585 Studies of Forms and Genres**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 595 Special Topics in Comparative Literary History**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 609 Special Topics in Asian Literary Theory and Criticism**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 610 Special Topics in Literary Theory and Criticism**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**0 C LIT 630 Cross-Cultural Studies in Literature**

★3-6 (*variable*) (variable, 3-0-0). The focus of this course will vary from year to year. Topics may include: immigrant literature, literature of the diaspora. Prerequisite: Reading knowledge of one relevant language other than English.

**C LIT 641 Surrealism: Theory and Practice**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**C LIT 642 Literary Existentialism: Theory and Practice**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**C LIT 645 Comparative Studies in 20th-Century Literature**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Reading knowledge of one relevant language other than English.

**C LIT 696 Seminar Course**

★3-6 (*variable*) (variable, 0-3s-0). Prerequisite: Reading knowledge of two languages other than English.

**C LIT 697 Special Reading Course I**

★3-6 (*variable*) (variable, 0-3s-0).

**C LIT 698 Special Reading Course II**

★3-6 (*variable*) (variable, 0-3s-0).

**C LIT 699 Conference Course**

★3-6 (*variable*) (variable, 0-3s-0).

**C LIT 900 Directed Research Project**

★3 (*fi 6*) (variable, unassigned).

## 201.42 Comptabilité, CMPT

Faculté Saint-Jean

### Cours de 1er cycle

**COMPT 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. Prérequis: ECONE 101/102.

**COMPT 322 Gestion et méthodes de contrôle**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-2). 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. Prérequis: COMPT 311.

**COMPT 414 Comptabilité financière (niveau intermédiaire)**

★3 (*fi 6*) (l'un ou l'autre semestre, 3-0-2). Traitement approfondi de la théorie et des méthodes du modèle de comptabilité GAAP (Principes de comptabilité généralement acceptés) et évaluation de ses points forts et de ses points faibles. Des comparaisons seront faites avec d'autres modèles comptables. Prérequis: COMPT 311, 322.

## 201.43 Computer Engineering, CMPE

Division of Computing Science, Department of Electrical and Computer Engineering, Faculty of Engineering; and Faculty of Science

### Undergraduate Courses

**CMPE 313 Software Engineering**

□4.5 (*fi 6*) (second term, 3-0-3). The software crisis. The software lifecycle and the design process. Properties of quality software. Requirements, analysis and software specification techniques. Software design techniques including data flow and data structure methods. Implementation and quality assurance techniques. Features of programming languages and programming environments which support good software engineering practice. Software project management. Prerequisite: CMPUT 204. (★3)

**CMPE 382 Computer Organization and Architecture**

□3 (*fi 6*) (second term, 3-0-0). Survey of the organization of various micro, mini- and mainframe computers. Design of the CPU control unit. Memory organization including virtual and cache memories. Parallelism in computers. Prerequisite: E E 380. (★3)

**CMPE 401 Computer Interfacing**

□3.8 (*fi 6*) (first 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. Prerequisites: E E 350, 380, 480; and E E 316 or 317. (★3)

**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. (★3)

**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. (★3)

## 201.44 Computing Science, CMPUT

Department of Computing Science  
Faculty of Science

### Notes

- (1) Students with appropriate academic standing, and who are enrolled in any Faculty of Science Honors, Specialization, or Computing Science minor programs, will be given preference in registering for computing science courses required in these four-year programs.
- (2) Students with no previous computing experience should enrol in CMPUT 101 instead of CMPUT 114. Students should seek advice from a departmental advisor. Credit will be granted for only one of CMPUT 114 or ENCMP 100.
- (3) Students who enrol in CMPUT 101 must complete CMPUT 102 and 115 in order to apply to Specialization or Honors programs.

The following is a list of courses which, for the most part, are available when resources permit, to any student who satisfies the prerequisite and corequisite requirements. Any special restrictions are specified within the course description.

### Undergraduate Courses

**CMPUT 101 Introduction to Computing**

★3 (*fi 6*) (either term, 3-0-3). This course provides an overview of computing science concepts for students with little or no programming background. Topics include representation of data; machine architecture; operating system concepts; properties of algorithms and computational problems; syntax of a high-level procedural programming language; basic data types and control structures. Students do introductory programming for a portion of the course. See Notes (2) and (3) above.

**CMPUT 102 Structural Programming and Data Structures**

★3 (*fi 6*) (either term, 3-0-3). Introduction to basic software engineering principles and the modern tools of computing. Syntax of a high-level procedural programming languages; review of basic data types and control structures, and their application to problem solving. Introduction to advanced data types such as strings, arrays, stacks, queues, and recursive data structures. For students who have completed CMPUT 101. Prerequisite: CMPUT 101. See Notes (2) and (3) above.

**CMPUT 114 Introduction to Computing Science**

★3 (*fi 6*) (either term, 3-0-3). An introduction to the modern tools of computing, including e-mail and networking; solving problems by writing small computer programs in a high-level programming language. Students are introduced to static data typing, iterative control structures, and procedural abstraction. Discussion of elementary algorithms and well-established software engineering techniques for constructing elegant and robust solutions to simple problems. Prerequisites: Pure Math 30 and Computing Science 30 or equivalent. See Notes (2) and (3) above.

**CMPUT 115 Programming with Data Structures**

★3 (*fi 6*) (either term, 3-0-3). A review of basic software engineering principles with an introduction to concepts of specification, implementation, and testing. The extension of procedural abstraction from CMPUT 114, including data abstraction and module definition and re-use. Introduction to recursive control, dynamic data structures (e.g. lists, strings, queues, tables) and their associated algorithms (e.g. traversal, sorting, searching, retrieval). Prerequisite: CMPUT 102 or CMPUT 114 or ENCMP 100. See Notes (2) and (3) above. Effective 1999, prerequisite: CMPUT 102 or 114 or ENCMP 100.

**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. Corequisite: CMPUT 272.

**CMPUT 204 Algorithms I**

★3 (*fi 6*) (either term, 3-0-1). 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, CMPUT 272; MATH 113, 114, or 117.

### **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. Corequisite: CMPUT 201. Credit may be obtained in only one of CMPUT 229 or 285.

### **CMPUT 272 Formal Systems and Logic In Computing Science**

★3 (fi 6) (either term, 3-1s-3). 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: CMPUT 101 or 114 or equivalent. See Note (2).

### **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; hardware devices, physical organization, and access methods for file storage; file I/O; introduction to database systems. Prerequisite: CMPUT 201.

### **CMPUT 301 User Interfaces and Software Design**

★3 (fi 6) (either term, 3-0-3). Object-oriented design and analysis, with user-interfaces as the primary example. Architectural design patterns; Basic 2-D graphics; Human performance models; User-interface architectures; User-interface software tools. Prerequisite: CMPUT 201. Credit may be obtained in only one of CMPUT 301 and CMPUT 311.

### **CMPUT 304 Algorithms II**

★3 (fi 6) (first 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, 229, and 291; STAT 221; one of MATH 128 or 223.

### **CMPUT 306 Introduction to Image Processing**

★3 (fi 6) (second 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 215 and STAT 222.

### **CMPUT 313 Telecommunications and Computers**

★3 (fi 6) (either term, 3-0-3). Introduction to computer communication networks. Digital transmission of data, audio and video content. The OSI reference model. Protocols for error and flow control. Medium access protocols. Routing and congestion control. Internet architecture and protocols. Recent advances in networking. Prerequisites: CMPUT 201, 204, 229, STAT 221. Recommended: STAT 222.

### **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, MATH 120.

### **CMPUT 329 Computer Organization and Architecture II**

★3 (fi 6) (either term, 3-0-3). Digital circuits, combinational systems, memory, register transfer, control logic design, CPU design, and advanced topics on micro-architectures. Prerequisite: CMPUT 229. Credit may be obtained in only one of CMPUT 329 or 285.

### **CMPUT 340 Introduction to Numerical Methods**

★3 (fi 6) (first 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 and 214. Credit cannot be obtained for more than one of CMPUT 340 or 418; MATH 280 or 486.

### **CMPUT 366 Artificial Intelligence Applications**

★3 (fi 6) (either term, 3-0-3). Introduction to problem solving as search, and the tradeoff between knowledge and search. Problems of knowledge acquisition, representation and use for knowledge-based problem solving. Prerequisite: CMPUT 325.

### **CMPUT 379 Operating System Concepts**

★3 (fi 6) (either term, 3-0-3). Definition of a process; process states and state transitions; process control block; operations on processes; interrupt processing; parallel processing; resource allocation; shared and unshared allocation; critical sections; semaphores; deadlock; deadlock prevention, avoidance, detection, and recovery; memory management; memory allocation schemes; virtual memory;

paging and segmentation; page replacement strategies; working sets; demand paging; job and processor scheduling; scheduling levels, objectives, and criteria; various scheduling algorithms; multi-processor considerations; file system functions; file organization; tree structured file systems; space allocation; file catalogs; file access control mechanisms; operating systems security. Prerequisites: CMPUT 204, 229, 291.

### **CMPUT 391 Database Management Systems**

★3 (fi 6) (either term, 3-0-3). Logical data modeling process, relational database design (normalization), query processing, transaction management, new technological trends (distributed databases, object-orientation, knowledge base systems). Prerequisites: CMPUT 204, 229, 291.

### **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 1 to 9 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. This course cannot be used in place of a senior-level CMPUT option. Prerequisites: WKEXP 922.

### **CMPUT 401 Software Engineering**

★3 (fi 6) (either term, 3-0-3). The software life cycle: specifications, design, coding, testing, documentation and maintenance. Project organization including development tools, resource estimation, team organization and review. The class will organize and implement a complete software project. Prerequisites: CMPUT 301 and 379.

### **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) (second term, 3-0-3). A project-based course dealing with the design and implementation of behavior-based robots to accomplish specific tasks. Students work in groups and are introduced to concepts in sensor technologies, sensor data processing, motion control, embedded system design, real-time programming, and behavior arbitration. Prerequisite: CMPUT 229 and a 300-level Computing Science course or consent of Instructor. Offered in alternate years.

### **CMPUT 414 Introduction to Multimedia Technology**

★3 (fi 6) (either term, 3-0-3). Overview of multimedia. Image compression, encryption, and multimedia databases. Audio signal processing, teleconferencing, and video compression. Prerequisite: CMPUT 291. Corequisite: CMPUT 301 or 306 or 411 or instructor's consent.

### **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 and a 300-level Computing Science course or consent of Instructor.

### **CMPUT 418 Numerical Analysis: Numerical Algebra**

★3 (fi 6) (either term, 3-0-2). Introduction to selected topics in numerical linear and nonlinear algebra. Areas covered include floating point arithmetic and error analysis, systems of linear equations, roots of nonlinear equations, overdetermined systems, eigenvalues and eigenvectors. Prerequisites: CMPUT 304, MATH 214. Credit cannot be obtained for more than one of CMPUT 340, 418, MATH 280 or 486. Offered in alternate years.

### **CMPUT 419 Numerical Analysis: Numerical Approximation**

★3 (fi 6) (second term, 3-0-2). An introduction to selected topics in numerical approximation. Areas covered include floating point arithmetic and error analysis; polynomial and other interpolations; approximation methods; numerical integration; and numerical solution of ordinary differential equations. Prerequisites: CMPUT 304, MATH 215. Credit may not be obtained in both CMPUT 419 and MATH 486. Offered in alternate years.

### **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; STAT 222. Offered in alternate years.

### **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 301, 325.

#### **CMPUT 429 Computer Systems and Architecture**

★3 (fi 6) (either term, 3-0-3). An investigation of computer system design concepts including requirements, specifications, implementation and modification. Instruction sets, arithmetic/logic unit design, bus structures, I/O structures, control organization and implementation. Discussion and use of hardware description languages. Prerequisite: One of CMPUT 304, 329, or 379; MATH 215 and STAT 222. Offered in alternate years.

#### **CMPUT 466 Foundations of Artificial Intelligence**

★3 (fi 6) (either term, 3-0-3). Fundamental issues in AI, including knowledge representation, deductive, inductive, and probabilistic reasoning, with focus on advanced topics such as machine learning, language understanding, and planning. Prerequisite: CMPUT 366 or consent of Instructor. Credit may be obtained in only one of CMPUT 451 or 466.

#### **CMPUT 474 Formal Languages, Automata, and Computability**

★3 (fi 6) (second term, 3-0-0). Formal grammars; normal forms; relationship between grammars and automata; regular expressions; finite state machines; state minimization; pushdown automata; Turing machines; computability; the halting problem; introduction to recursive function theory. Prerequisite: CMPUT 325.

#### **CMPUT 485 System and Network Administration**

★3 (fi 6) (either term, 3-0-3). Structure of an operating system (Linux); organization of system directories; system installation and maintenance; system implementation; kernel configuration; system interface to the network; basics of TCP/IP (the Internet); services across networks (daemons); system and network security; organization of selected software packages (case studies). Prerequisite: CMPUT 379. Offered in alternate years.

#### **CMPUT 495 Honors Seminar**

★0 (fi 2) (either term, 0-1s-0). Prerequisite: A 300-level Computing Science course. Note: Required of all Honors Computing Science students during their degree program.

#### **CMPUT 496 Topics in Computing Science**

★3 (fi 6) (first term, 3-0-0). Prerequisite: A 300-level CMPUT course.

#### **CMPUT 497 Topics in Computing Science**

★3 (fi 6) (second term, 3-0-0). Prerequisite: A 300-level CMPUT course.

#### **CMPUT 498 Topics in Computing Science**

★3 (fi 6) (first term, 3-0-3). Prerequisite: A 300-level CMPUT course.

#### **CMPUT 499 Topics in Computing Science**

★3 (fi 6) (second term, 3-0-3). Prerequisite: A 300-level CMPUT course.

## Graduate Courses

Students entering the graduate program are expected to have an adequate background in computing science. Students lacking adequate background may be required to take one or more of the following undergraduate courses in addition to their regular graduate program: CMPUT 304, 340, 379, 391, 401, 411, 418, 429, 466, 474, 485 (see §201.44).

Thesis-based students are expected to take a minimum of three 600-level courses (excluding 601 and 603). Course-based students are expected to take a minimum of five 600-level courses (excluding 601).

**Note:** In all cases where prerequisite courses are specified, the phrase "or equivalent courses taken at the University of Alberta or at another university" is understood. Where students are uncertain whether they meet prerequisite requirements, they should consult with their program advisor, and if necessary, with the instructor of the graduate course.

#### **CMPUT 510 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

#### **CMPUT 511 Computer Graphics**

★3 (fi 6) (either term, 3-0-3).

#### **CMPUT 520 Compiler Construction**

★3 (fi 6) (either term, 3-0-3).

#### **CMPUT 525 Object-Oriented Computing**

★3 (fi 6) (either term, 3-0-0). A study of the object-oriented computing model and its application to software design and programming. An examination of object-oriented programming language with respect to features, design, run-time structure, and implementation. Prerequisite: CMPUT 325.

#### **CMPUT 531 Robotics**

★3 (fi 6) (either term, 3-0-3).

#### **CMPUT 540 Computer Networks**

★3 (fi 6) (either term, 3-0-3).

#### **CMPUT 551 Artificial Intelligence**

★3 (fi 6) (either term, 3-0-3).

#### **CMPUT 560 Software Engineering**

★3 (fi 6) (either term, 3-0-3).

#### **CMPUT 570 Introduction to the Theory of Computation**

★3 (fi 6) (either term, 3-0-3).

#### **CMPUT 580 System and Network Administration**

★3 (fi 6) (either term, 3-0-3).

#### **CMPUT 581 Operating Systems**

★3 (fi 6) (either term, 3-0-3).

#### **CMPUT 590 Database Management Systems**

★3 (fi 6) (either term, 3-0-3).

#### **CMPUT 601 Seminar**

★3 (fi 6) (first term, 0-2s-0). Required of all graduate students.

#### **CMPUT 603 Research Methods**

★3 (fi 6) (second 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. Required for all thesis-based 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 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 612 Virtual Reality**

★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 620 Topics in Programming Languages**

★3 (fi 6) (either term, 3-0-0).

#### **CMPUT 621 Logic Programming**

★3 (fi 6) (either term, 3-0-0).

#### **CMPUT 625 Object-Oriented Programming Languages**

★3 (fi 6) (either term, 3-0-0).

#### **CMPUT 630 Topics in Computer Architecture**

★3 (fi 6) (either term, 3-0-0).

#### **CMPUT 631 Robotics**

★3 (fi 6) (either term, 3-0-0).

#### **CMPUT 632 Parallel and Multiprocessor Architectures**

★3 (fi 6) (either term, 3-0-0).

#### **CMPUT 640 Topics in Computer Networks**

★3 (fi 6) (either term, 3-0-0).

#### **CMPUT 641 Advanced Computer Networks**

★3 (fi 6) (either term, 3-0-0).

#### **CMPUT 642 Computer Network Protocols**

★3 (fi 6) (either term, 3-0-0).

#### **CMPUT 643 Special Purpose Networking**

★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 Computing Science**

★3 (fi 6) (either term, 3-0-0).

#### **CMPUT 652 Topics in Computing Science**

★3 (fi 6) (either term, 3-0-0).

#### **CMPUT 653 Automated Reasoning**

★3 (fi 6) (either term, 3-0-0).

#### **CMPUT 655 Constraint-Based Reasoning**

★3 (fi 6) (either term, 3-0-0).

#### **CMPUT 656 Logic Foundations**

★3 (fi 6) (either term, 3-0-0).

#### **CMPUT 657 Heuristic Search**

★3 (fi 6) (either term, 3-0-0).

#### **CMPUT 658 AI and Cognitive Science**

★3 (fi 6) (either term, 3-0-0).

#### **CMPUT 659 Adaptive Systems**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 660 Topics in Software Engineering**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 661 Software Architecture**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 662 Software Specification and Verification**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 663 Software Process and Quality**

★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 671 Empirical Algorithms**

★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 680 Topics in Systems**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 681 Parallel Programming**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 682 Fundamentals of Distributed Systems**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 683 Performance Evaluation**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 690 Topics in Databases**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 691 Object-Oriented Databases**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 692 Modern Database Management Systems**

★3 (fi 6) (either term, 3-0-0).

**CMPUT 693 Distributed Database Systems**

★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.

**201.44.1 MSc in Software Technology**

Because these courses are offered at variable times throughout the year, please visit the website <http://www.cs.ualberta.ca/~westmost/> or contact the Department of Computing Science for time and location of course offerings.

**CMPUT 760 Topics in Software Development and Evolution**

★3 (fi 33) (either term, 36 hours). Topics cover the primary tasks of software development and evolution, their methods/techniques and the use of tools to support these methods/techniques. Possible topics include: requirements elicitation, analysis and specification, software architecture and design, software verification and testing, software maintenance and version management, software and system re-engineering, Computer-Aided Software Engineering (CASE) tools and environments. Prerequisites: Undergraduate degree in Computer Science or equivalent and at least two years of relevant experience in the software industry.

**CMPUT 770 Topics in Software Management**

★3 (fi 33) (either term, 36 hours). Topics cover the primary activities and techniques in software management and the use of tools to support software management. Possible topics include: software engineering best practices, software quality and process, and software project management. Prerequisites: Undergraduate degree in Computer Science or equivalent and at least two years of relevant experience in the software industry.

**CMPUT 780 Topics in Software Application and Support**

★3 (fi 33) (either term, 36 hours). Topics cover areas of application and support of software technology. Possible topics include: user interface design, software reliability, software security, real-time and embedded systems, high speed ATM networks and distributed object management. Prerequisites: Undergraduate degree in Computer Science or equivalent and at least two years of relevant experience in the software industry.

**CMPUT 790 Software Technology Project**

★6 (fi 33) (two term, 60 hours). A project course in which the student applies the knowledge acquired in other courses taken in the MSc in Software Technology Program. The student undertakes a small research project on the design, management and/or support of a software system under the supervision of a faculty member. Key requirements of this course are the successful completion of a project proposal and final project report. Prerequisites: Undergraduate degree in Computer Science (or equivalent), at least two years of relevant experience in the software industry and the completion of at least three courses to be credits toward the MOST degree.

**201.45 Consumer Studies, CONS**

Department of Human Ecology

Faculty of Agriculture, Forestry, and Home Economics

**Note:** See also Family Studies; Human Ecology; and Textiles, Clothing, and Culture listings for related courses.

**Undergraduate Courses****01 CONS 220 Fundamentals of 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 consumer policy, consumer education, and marketing. Prerequisite: ECON 101 or completion of an approved economics module available from the Department of Human Ecology. Not open to students with credit in MARK 422.

**CONS 330 Family Finance**

★3 (fi 6) (either term, 3-0-1.5). Principles of money management applied to family income and expenditure. Special emphasis will be placed on the management of credit, savings, investment, insurance, and pre-retirement planning. Prerequisites: ECON 101 and ECON 102, or completion of an approved economics module available from the Department of Human Ecology.

**CONS 340 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 programs and policies which address those issues. Issues explored will include poverty, work and family, the economics of aging, children and money, and intrafamily allocation of resources. Prerequisites: FAM 110 and either ECON 101 and ECON 102, or completion of an approved economics module available from the Department of Human Ecology.

**CONS 420 Advanced Topics in Consumer Behavior**

★3 (fi 6) (either term, 3-0-0). Advanced study of consumer behavior theories and their application to consumer research that informs marketing, consumer policy, and consumer education. Prerequisite: CONS 220 or MARK 422. Not open to students with credit in MARK 423.

**CONS 430 Consumer Issues and Policies**

★3 (fi 6) (either term, 2-2s-0). Principles and processes of policy development, implementation and analysis; analysis of current issues faced by Canadian consumers; examination of government programs and policies regarding protection of consumers in the marketplace. Prerequisite: CONS 220 or MARK 422.

**Graduate Courses****CONS 630 Seminar in Consumer Studies**

★3 (fi 6) (either term, 0-3s-0). Examination of the research and theory related to consumer behavior, the application of these to consumer problems and the implications for consumer education. Prerequisite: CONS 220 or MARK 222 or consent of Instructor.

**201.46 Curriculum et méthodologie, CU ME**

Faculté Saint-Jean

**Cours de 1er cycle****CU ME 301 Introduction à l'éducation physique au niveau élémentaire**

★3 (fi 6) (l'un ou l'autre semestre, 0-3L-0). L'étude de l'enfant dans ses expériences de mouvement. La terminologie spécifique à l'enseignement de l'éducation physique en français. Le développement des habiletés motrices et psychomotrices de l'enfant. Les programmes d'éducation physique à l'élémentaire.

**CU ME 308 Introduction à la didactique de la langue (élémentaire/secondaire)**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Les caractéristiques de l'approche communicative. Les caractéristiques des discours. Evolution historique de l'enseignement des langues. Les principes de base pour l'enseignement du français en immersion et en milieu minoritaire. Etude du programme d'études et analyse du matériel didactique. Ce cours n'est pas accessible aux étudiants ayant des crédits en CU ME 307, 310, 311, 334, 335.

**CU ME 309 Didactique de la communication orale et écrite à l'élémentaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-2). Etude des quatre habiletés langagières. Stratégies d'enseignement et application pratique. Moyens d'intervention, correction et évaluation. Ce cours n'est pas accessible aux étudiants ayant des crédits en CU ME 310, 311, 336, 337. Prérequis: CU ME 308.

**CU ME 321 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. Ce cours n'est pas accessible aux étudiants ayant des crédits en CU ME 316 ou 331.

**CU ME 322 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. Ce cours n'est pas accessible aux étudiants ayant des crédits en CU ME 320, 332 ainsi qu'en CU ME 405 offert avant septembre 1995.

**CU ME 326 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.

**CU ME 330 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. Etude 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. Se sensibiliser au rôle que joue les études sociales dans le développement du citoyen. La planification de l'enseignement des études sociales et stratégies d'enseignement. Ce cours n'est pas accessible aux étudiants ayant des crédits en CU ME 212, CU ME 405 offerts avant septembre 1995, et CU ME 333.

**CU ME 331 Didactique des mathématiques au niveau élémentaire**

★1.5 (fi 3) (l'un ou l'autre semestre, 1.5-0-0). Initiation à l'enseignement des mathématiques à l'élémentaire. Selon les stades de développement de l'enfant de 5 à 11 ans. Etude et interprétation des exigences du programme du ministère de l'Éducation. Stratégies et techniques d'enseignement. Mises en situation. Ce cours n'est pas accessible aux étudiants ayant des crédits en CU ME 316.

**CU ME 332 Didactique des sciences au niveau élémentaire**

★1.5 (fi 3) (l'un ou l'autre semestre, 1.5-0-0). Initiation à l'enseignement des sciences à l'élémentaire. Etude et interprétation des exigences du programme du ministère de l'Éducation. Se sensibiliser au rôle que joue la science dans la société. Comment encourager les élèves à explorer et à étudier les sciences. Mises en situation. Ce cours n'est pas accessible aux étudiants ayant des crédits en CU ME 320 ainsi qu'en CU ME 405 offert avant septembre 1995.

**CU ME 333 Didactique des études sociales à l'élémentaire**

★1.5 (fi 3) (l'un ou l'autre semestre, 1.5-0-0). Analyse des programmes d'études sociales pour les francophones en milieu minoritaire et pour le milieu d'immersion française; et étude des ressources prescrites par le ministère de l'Éducation. La planification de l'enseignement des études sociales et stratégies d'enseignement. Ce cours n'est pas accessible aux étudiants ayant des crédits en CU ME 312 ainsi qu'en CU ME 405 offert avant septembre 1995.

**CU ME 338 L'enseignant et le programme d'études à l'élémentaire**

★1.5 (fi 3) (l'un ou l'autre semestre, 1.5-0-0). Examen des programmes d'études du ministère et du rôle de l'enseignant à l'élémentaire. Étude critique et interprétation des exigences. L'enseignant face à l'étendue des programmes d'études. Etude des diverses matières et de leur contribution au développement intégral de l'enfant. Exploration des stratégies et des modalités d'intervention pédagogique, en fonction d'une exploitation intégrée des apprentissages.

**CU ME 339 Enseignement de la musique au niveau élémentaire I**

★3 (fi 6) (l'un ou l'autre semestre, 0-3L-0). Prérequis: MUSIQ 103 ou l'équivalent, ou MUSIQ 151 et 155/156 ou l'équivalent.

**CU ME 343 Introduction à l'enseignement des beaux-arts et de la musique à l'élémentaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Une première partie du cours est consacrée à l'éveil musical chez l'enfant à l'élémentaire. La deuxième partie du cours porte sur l'intégration des beaux-arts dans la vie quotidienne de l'enfant à l'école, comprenant des ateliers pratiques.

**CU ME 347 Utilisation de l'ordinateur en éducation**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-2). Les principales composantes. Le fonctionnement. Programmation utile pour la salle de classe. Initiation aux principales applications. Internet comme outil indispensable pour l'apprentissage. Réflexion sur le rôle de l'ordinateur en éducation.

**CU ME 357 L'enseignement dans les écoles françaises en milieu minoritaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Cours de pédagogie et de méthodologie à l'intention des futurs enseignants qui se dirigent vers l'enseignement dans les écoles françaises en milieu minoritaire. Les thèmes suivants seront étudiés: le rôle et les responsabilités de l'enseignant face à l'élève minoritaire et à sa communauté; les attitudes et les actions de l'enseignant qui vont permettre à

l'étudiant de s'approprier ses réalités culturelles; la pédagogie de l'interaction; l'éducation communautaire; le développement de programmes et de matériel pédagogique; la programmation culturelle.

**CU ME 358 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. Etudes des nouvelles tendances dans la didactique de l'écriture et de la lecture. Comparaison de l'approche traditionnelle et de l'approche fonctionnelle dans l'enseignement de la grammaire. Démarche pour la planification d'une unité en production écrite et pour l'enseignement de la grammaire en contexte communicatif.

**CU ME 359 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; méthodes d'enseignement et d'analyse du roman, de la poésie et de la pièce de théâtre. Les étudiants sont invités à faire l'expérience des méthodes suggérées.

**CU ME 360 Enseignement des études sociales au 1er cycle du secondaire**

★3 (fi 6) (premier 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. Prérequis: Deux cours complets dans la spécialisation.

**CU ME 361 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'histoire des études sociales et des conceptions d'études sociales; étude des méthodes d'enseignement et d'évaluation des études sociales; et intégration des actualités aux objectifs des programmes d'études sociales. Prérequis ou corequis: CU ME 360.

**CU ME 363 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; à faire 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. Prérequis: un cours complet dans la spécialisation.

**CU ME 367 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 science 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. Prérequis: un cours complet dans la spécialisation.

**CU ME 387 Enseignement de la musique au niveau secondaire I**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Prérequis ou corequis: deux cours complets dans la spécialisation.

**CU ME 388 Enseignement de la musique au niveau secondaire II**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Prérequis ou corequis: CU ME 387.

**CU ME 389 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.

**CU ME 405 Séminaire en enseignement élémentaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude de sujets propres à l'enseignement élémentaire.

**CU ME 410 Enseignement de la littérature enfantine**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Familiarisation avec la littérature enfantine. Cours centré sur la création et l'interaction avec le discours littéraire. Sensibilisation au processus de la lecture esthétique.

**CU ME 444 Etude personnelle dirigée dans le domaine de l'enseignement au niveau élémentaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Prérequis: accord du professeur et du Vice-doyen aux affaires académiques.

**CU ME 458 Grands courants dans l'enseignement de la langue**

★3 (fi 6) (l'un ou l'autre semestre, 0-3L-0). Principes d'acquisition de langue (langue maternelle et langue seconde). Le cours invitera les participants à réfléchir sur la dimension communicative de la langue, et leur permettra de se familiariser tant au niveau théorique que pratique avec la méthodologie de l'approche communicative. Les participants seront invités à partager leurs idées et leurs expériences. Ce cours est réservé aux enseignants.

**CU ME 459 Séminaire dans le domaine de l'enseignement au niveau élémentaire**

★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.

**CU ME 494 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.

**CU ME 496 L'enseignement religieux et l'éducation morale**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0).

**CU ME 498 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.

**CU ME 499 Etude personnelle dirigée dans le domaine de l'enseignement au niveau secondaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Prérequis: accord du professeur et du Vice-doyen aux affaires académiques.

**Cours de 2e cycle****CU ME 500 Théorie générale de curriculum: contexte écoles françaises en milieu minoritaire et écoles d'immersion**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Analyse approfondie des définitions et théories du curriculum, de ses composantes et de ses bases idéologiques et de leurs applications dans les écoles françaises en milieu minoritaire et en immersion. Limité aux détenteurs d'un baccalauréat en éducation ou l'équivalent.

**201.47 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 100 The Spectrum of Dance in Society**

★3 (fi 6) (either term, 2-0-2). 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. For BPE students only.

**DANCE 300 Dance History and Philosophy**

★3 (fi 6) (either term, 3-0-0). The history and philosophy of dance from primitive times to the present. Special emphasis will be on major forms of dance in the 20th century, dance in Canadian culture and personalities who have influenced dance in art and culture.

**DANCE 340 Modern Dance**

★3 (fi 6) (either term, 3-0-0). 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, 3-0-0). Development of personal movement skills in a variety of modern dance techniques combined with knowledge of movement and dance principles.

**DANCE 350 International Folk Dance**

★3 (fi 6) (either term, 3-0-0). 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, 1-2s-0). Children's dance from the perspective of the child as creator, performer and spectator. Opportunities to observe, work with and perform for children will be provided. Prerequisite: PEDS 292, 293, 338, or consent of Faculty.

**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 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.

**201.48 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) **Activity-course dress requirement for first class.** Students are expected to attend the first class of any activity course appropriately dressed for activity participation.
- (2) 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 taken 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.

**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 165 Ballet**

★1.5 (fi 3) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in either RAD or Cecchetti syllabus, including barre and centre floor work such as positions, port de bras, elevation and travelling.

**DAC 399 Selected Topics in Dance**

★3 (fi 6) (either term, 3-0-0). Theory and practice of selected dance forms. Refer to the Registration Procedures Book for information on specific sections. Prerequisite: consent of Faculty.

**201.49 Danish, DANSK**

Department of Modern Languages and Cultural Studies:

Germanic, Romance, Slavic

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 Danish language background should consult a Department advisor. Such students may be granted advanced placement and directed to register in a course more suitable to their level of ability or they may be encouraged to seek "Credit by Special Assessment" (see \$44.5) where 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 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 Scandianvian (SCAND) listings.

**Undergraduate Courses****DANSK 100 Elementary Danish**

★6 (fi 12) (two term, 3-0-2). This course is designed to give basic practical skill in everyday spoken and written Danish. The oral approach, using the laboratory, is followed.



**DANSK 200 Second-Year Danish**

★6 (*fi 12*) (two term, 3-0-1). Reading and study of selected texts in Danish literature and culture. Composition and conversation. Prerequisite: DANSK 100 or consent of Department.

**201.50 Dental Hygiene, D HYG**

Department of Oral Health Sciences  
Faculty of Medicine and Dentistry

**Undergraduate Courses****D HYG 200 Anatomy**

★3.5 (*fi 7*) (first term, 47 hours). To provide a sound theoretical and practical knowledge of detailed head and neck anatomy for the clinical practice of dental hygiene. Emphasis will be placed on radiological skeletal anatomy and neural anatomy for local anesthetic purposes.

**D HYG 211 Concepts in Dental Hygiene Practice**

★5.5 (*fi 11*) (two term, 84 hours). A lecture course integrating the knowledge and practice of clinical dental hygiene. This course is structured around the four key areas of responsibility for the clinical dental hygienist, namely oral assessment, treatment planning, disease prevention and health maintenance and dental hygiene therapy.

**D HYG 212 Preclinical Dental Hygiene**

★6 (*fi 12*) (first 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*) (second term, 90 hours). A clinical course integrating the knowledge, practice, and skills of dental hygiene practice.

**D HYG 214 Clinical Practice I**

★7.5 (*fi 15*) (Spring/Summer, 216 hours). A clinical course integrating the knowledge, practice and skills of dental hygiene practice. Included will be instruction in nutritional assessment and counselling procedures.

**D HYG 215 Biomaterials**

★2 (*fi 4*) (two term, 28 hours). The course is designed to give the dental hygiene students a general knowledge of dental materials, to allow them to recognize the various dental materials and to have some knowledge of their manipulation and application, and to be able to intelligently discuss the clinical applications and problems associated with the materials with both the dentist and patient.

**D HYG 216 Management of Special Needs Patients**

★1 (*fi 2*) (second term, 14 hours). A lecture course that emphasizes the clinical care and management techniques required for patients with special needs; the physically and/or mentally disabled patient, the sensory disabled patient, and the medically compromised patient. Students will be responsible for completing relevant projects for course evaluations.

**D HYG 217 Professional Ethics and Communication**

★1 (*fi 2*) (Spring/Summer, 20 hours). This is a team instructed course that will provide a range of skills: an experience in the development of interpersonal and critical thinking skills through simulation exercises; a knowledge of professional ethics with moral reasoning and ethical decision making. Emphasis is placed on how these topics and related skills impact on a dental hygienist's ability to successfully practise in today's health care delivery system.

**D HYG 220 Oral Health Education**

★3 (*fi 6*) (second term, 54 hours). An introduction to the principles of dental health education, construction and utilization of audiovisual materials, the operation of audiovisual equipment and instructional preparation for group education is included.

**D HYG 222 Population Health and Health Promotion**

★2 (*fi 4*) (second term, 34 hours). Population Health and Health Promotion is that portion of the dental hygiene curriculum which prepares students with a broad understanding of the factors that affect the health and well-being of the total population. It will provide students with an understanding of the determinants of health and suggest strategies for working with other disciplines and community agencies to affect health outcomes. It will also provide students with the knowledge and skills to assess the need for a plan and deliver appropriate services to meet oral health needs on a community basis.

**D HYG 230 Dental Anatomy**

★1.5 (*fi 3*) (first term, 20 hours). A self-study course that is concerned with nomenclature, biologic considerations of tooth form and function; permanent and deciduous teeth are studied in detail.

**D HYG 231 Office Emergencies**

★1 (*fi 2*) (Spring/Summer, 14 hours). This is a lecture course that will include the etiology, symptoms, and primary treatment methods associated with disease entries that have the potential of constituting a dental office emergency.

**D HYG 232 Dental Specialties**

★1 (*fi 2*) (second term, 14 hours). Introduction to specialties in dental practice and the role of the dental hygienist in each area. A clinical rotation in each specialty is included.

**D HYG 240 Radiology**

★2 (*fi 4*) (two term, 34 hours). An introductory course covering the history of dental radiography as well as lectures in radiation physics, radiobiology, radiation control and radiation hygiene. Common types of radiographic films and film characteristics will be discussed as well as photographic chemistry and methods of processing. Projection geometry, principles of dental radiography and normal radiographic anatomy as it relates to identification and mounting of radiographs will be stressed. Each student will also rotate through the clinics in the Second Term and Spring/Summer for preclinical experience.

**D HYG 241 Radiology**

★1 (*fi 2*) (Spring/Summer, 12 hours).

**D HYG 313 Clinical Practice II**

★16 (*fi 32*) (two term, 471 hours). This is an advanced clinical course that integrates the knowledge and practice of dental hygiene skills, dental assisting skills, dental practice management and administration.

**D HYG 316 Management of Special Needs Patients**

★1 (*fi 2*) (either term, 14 hours). A lecture course emphasizing the clinical care and management techniques required for patients with special needs; the physically and/or mentally disabled patient, the sensory disabled patient, and the medically compromised patient. Students will be responsible for completing relevant projects for course evaluation.

**D HYG 317 Ethics, Practice, and Leadership**

★2 (*fi 4*) (two term, 28 hours). A team instructed course that will provide the student with a knowledge of professional ethics with moral reasoning and ethical decision making, an experience with conducting a research study and presenting the findings at professional meetings, a further development of their interpersonal and critical thinking skills through simulation exercises, and a variety of other professional practice related topics.

**D HYG 321 Oral Health Education II**

★2 (*fi 4*) (second term, 52 hours). A continuation of D HYG 320. The application of Educational theory to teaching is provided by field experience in a variety of community settings.

**D HYG 322 Community and Preventive Dentistry**

★2 (*fi 4*) (two term, 37 hours). Focus on the dental hygienist's role in promoting health in the community, with an emphasis on epidemiology, research methodologies, program planning and delivery. Students will plan a model community dental health program using a systems approach.

**D HYG 325 Dental Hygiene Hospital Dentistry**

★0.5 (*fi 1*) (two term, 12 hours). Students are provided with experience in the utilization of an integrated health care approach to hospitalized special populations through rotations at Alberta Hospital and the University of Alberta Hospital.

**D HYG 326 Periodontology for the Dental Hygienist**

★3 (*fi 6*) (two term, 48 hours). A lecture and demonstration course designed to introduce the student to those procedures that are commonly associated with the practice of periodontics. Lectures on the classification of periodontal disease, the objectives of periodontal therapy and on how to assess periodontal conditions are also included. A periodontal clinical association with dental students will also take place on a clinic rotation basis.

**D HYG 329 External Rotation**

★2.5 (*fi 5*) (two term, 75 hours). Each student spends two weeks at an external dental clinic. 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**

★2 (*fi 4*) (two term, 48 hours). Clinical experience in intraoral examinations on patients as well as processing and mounting radiographs.

**D HYG 345 Geriatrics**

★1 (*fi 2*) (second term, 14 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 sixty years of age.

**D HYG 386 Anesthesia**

★1 (*fi 2*) (first term, 15 hours). A didactic course to provide students with the ability to evaluate and use the specific local anesthetic for a given patient. 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 anesthetics.

**D HYG 387 Anesthesia**

★0.5 (*fi 1*) (first term, 15 hours). A lab course to provide students with the ability

to evaluate and use the specific local anesthetic for a given patient. They 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 anesthetics. Prerequisite: Departmental approval.

## 201.51 Dentistry, DENT

Department of Oral Health Sciences  
Faculty of Medicine and Dentistry

### Undergraduate Courses

#### DENT 413 Fixed Prosthodontics

★2 (*fi 4*) (two term, 30 hours). A didactic course of the biological considerations in providing extracoronar restorations and fixed prosthesis. Emphasis is placed on treatment planning.

#### DENT 414 Fixed Prosthodontics

★4 (*fi 8*) (two term, 120 hours). Laboratory instruction in esthetic considerations of ceramic veneers. The clinical component requires a designated number of extracoronar restorations to be completed.

#### DENT 415 Endodontics

★1 (*fi 2*) (first term, 15 hours). A continuation of DENT 365 with advanced endodontic considerations.

#### DENT 416 Endodontics

★2 (*fi 4*) (two term, 60 hours). An introduction to clinical procedures with treatment carried out on selected patients.

#### DENT 417 Operative Dentistry

★1 (*fi 2*) (first term, 15 hours). The principles and procedures necessary to successful clinical practice will be emphasized. This is a continuation of DENT 367 in which the material will be covered in more depth and oriented specifically to dealing with patients rather than just in a laboratory situation. All the materials used in operative dentistry will be included in the discussions but special emphasis will be given to white restoratives.

#### DENT 418 Operative Dentistry

★5 (*fi 10*) (two term, 150 hours). A continuation of DENT 368 which will involve both laboratory and clinical components. The majority of the time will be clinical practice on patients to allow the student to further develop operative skills. All appropriate materials including silver amalgam, gold, and tooth colored materials will be used within a properly maintained operating environment. The laboratory portion will include exercises in posterior composites and anterior veneers.

#### DENT 421 Removable Prosthodontics

★2 (*fi 4*) (first term, 30 hours). A lecture/audiovisual series emphasizing the biological principles of complete denture construction. Prosthodontic pathology, relines, resilient liners, partial dentures, overdentures, immediate dentures and related nutritional concerns are presented.

#### DENT 422 Removable Prosthodontics

★5 (*fi 10*) (two term, 150 hours). A clinical experience in all treatment phases of basic removable prosthodontics.

#### DENT 423 Introduction to Dental Implants

★1 (*fi 2*) (second term, 15 hours). To develop a scientific understanding of the biological basis of implant dentistry and provide a description of its history and current status.

#### DENT 424 Endodontic Clinical Seminars

★0.5 (*fi 1*) (second term, 7 hours). Endodontic cases treated by the student will be presented to a small group in a seminar setting for discussion and evaluation.

#### DENT 426 Periodontics

★2 (*fi 4*) (two term, 30 hours). A continuation of the previous year which expands and gives a more indepth view of periodontal disease and available therapies. Emphasis is on the surgical techniques as methods for treating periodontal disease.

#### DENT 427 Periodontics

★3.5 (*fi 7*) (two term, 105 hours). Continues to involve the treatment of patients. Emphasis is on the initial preparatory phase of therapy, showing more versatility in the types of periodontal treatments and how these are interrelated with other dental disciplines. The student will develop the skills to diagnose and to treat moderate forms of periodontal disease and be able to learn how to integrate these treatments into a general dentistry practice.

#### DENT 428 Pediatric Dentistry

★1 (*fi 2*) (first term, 15 hours). The lecture course deals with treatment and management of the adolescent patient as well as space maintainers, preventive and interceptive orthodontics, fluorides in caries prevention and management of traumatic tooth injuries.

#### DENT 429 Pediatric Dentistry

★2.5 (*fi 5*) (two term, 75 hours). Introduction to clinical dental diagnosis and treatment of children and adolescents.

#### DENT 430 Orthodontics

★2 (*fi 4*) (two term, 30 hours). Diagnosis and treatment options, cephalometric eruption guidance and interceptive procedures, introduction to bonding/banding techniques.

#### DENT 431 Orthodontics

★3.5 (*fi 7*) (two term, 99 hours). Lab/clinic split. Fabrication of some common orthodontic appliances, clinical cases for treatment planning and care, orthodontic screening cases, molar uprighting cases if available, some functional appliance cases.

#### DENT 432 Diagnosis

★1 (*fi 2*) (first term, 15 hours). The fundamental principles involved in dental management of the diagnosed medically compromised patient will be discussed by lectures and audiovisual presentation of case examples.

#### DENT 433 Diagnosis and Treatment Planning

★1 (*fi 2*) (two term, 27 hours). Students are assigned to a diagnosis/treatment clinic in order to further refine skills in collecting and interpreting the dental patient's medical treatment, formulating an accurate diagnosis and rational treatment plan under the supervision and instruction of dentistry staff from various divisions and specialties. Each student will be responsible for personally treating or managing the treatment of assigned patients, one of which will be a medically compromised patient.

#### DENT 435 Radiology

★0.5 (*fi 1*) (two term, 12 hours). Ongoing clinical experience in radiographic film production and the reporting of radiographs on clinical patients.

#### DENT 438 Oral Surgery

★2 (*fi 4*) (two term, 30 hours). This course covers the diagnosis and treatment of basic principles of oral surgery. The student is introduced to the science of exodontia and related subjects. This course also covers other minor oral surgery procedures, e.g. biopsy technique, preprosthetic surgery.

#### DENT 439 Oral Surgery

★1 (*fi 2*) (two term, 30 hours). Clinical practice of exodontia with assisting introduced. Use of different instruments for oral surgery are emphasized. Suturing techniques and use of different forceps for extraction is taught in this course.

#### DENT 442 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 impact on a dentist in today's society.

#### DENT 443 Patient Management

★2 (*fi 4*) (two term, 59 hours). This course provides experience in the comprehensive care and management of assigned dental patients. Students are expected to plan, prioritize, and coordinate the delivery of dental care for their patients while practising proper infection control techniques.

#### DENT 445 Geriatrics

★1 (*fi 2*) (second 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 sixty years of age. Course requirements include an additional one day hospital program at the Youville Memorial Hospital for fourth-year Dentistry students.

#### DENT 451 Introduction to Clinical Practice II

★11 (*fi 22*) (Spring/Summer, 350 hours). Students will be introduced to the concept of dental care delivery in a multidisciplinary team setting. Comprehensive treatment will be provided to patients, involving disciplines of operative dentistry, prosthodontics, endodontics, and periodontics. Patient and practice management strategies will be reinforced. A two-week rotation to an external clinic may also occur.

#### DENT 466 Endodontics

★1 (*fi 2*) (two term, 36 hours). A continuation of DENT 416 with application to clinical practice. Endodontic treatment will be carried out on selected patients.

#### DENT 467 Restorative Dentistry

★1 (*fi 2*) (second term, 15 hours). Advanced topics in fixed prosthodontics, endodontics, and operative dentistry will be described and discussed.

#### DENT 473 Dental Implants

★1 (*fi 2*) (first term, 15 hours). To understand the factors involved in patient selection, referral, diagnosis and treatment planning in dental implantology and to understand the stages and methods of treatment, the complications and remedies as well as maintenance procedures.

#### DENT 474 Endodontic Clinical Seminars

★2 (*fi 4*) (two term, 28 hours). Endodontics cases treated by the student will be presented to a small group in a seminar setting for discussion and evaluation.

#### DENT 475 Hospital Dentistry

★2 (*fi 4*) (two term, 60 hours). A two week period of hospital training for senior students where they become familiar with hospital protocol and operating room

procedures, observe oral surgery and anesthesia, attend other medical and dental clinics, perform physical evaluation of patients and provide emergency dental care and patient treatment services. An experience in a Geriatric Treatment Hospital will be provided.

#### **DENT 477 Periodontics**

★2 (*fi 4*) (two term, 60 hours). Students will further expand their skills in diagnosis and treatment of advanced cases of periodontal disease by means of periodontal surgery. Patients treatment progress will be assessed by recall checks. Emphasis will be placed on interdisciplinary treatment approaches for handling patients' dental problems.

#### **DENT 478 Paediatric Dentistry**

★1 (*fi 2*) (first term, 15 hours). A seminar format course in which current and/or significant dental literature in paediatric dentistry will be presented and discussed by students and moderated by the instructor. Two to four guest lecture hours may also be included on topics of interest.

#### **DENT 479 Paediatric Dentistry**

★1.5 (*fi 3*) (two term, 45 hours). A clinical course designed to provide the student with the diagnosis, treatment and management of children and adolescents with more complex dental needs. The use of nitrous oxide analgesia is demonstrated on select cases.

#### **DENT 480 Orthodontics**

★1 (*fi 2*) (first term, 15 hours). Treatment planning, treatment options and appliance mechanisms for a variety of clinical situations and malocclusions.

#### **DENT 481 Orthodontics**

★2 (*fi 4*) (two term, 60 hours). Clinical experience, involving preventive, interceptive and simple treatment of orthodontic problems of particular concern to the general practitioner, is designed to enable the student to apply knowledge acquired in the lectures and laboratory.

#### **DENT 482 Oral Medicine and Pathology**

★2.5 (*fi 5*) (two term, 54 hours). The oral manifestations of local and systemic diseases are presented in a conference setting. Students are given specific teaching cases to which they apply a rational approach to clinical differential diagnosis and case management. They further apply their skills in assessing and managing patients through rotations in the Screening and Emergency Clinic.

#### **DENT 483 Diagnosis and Treatment Planning**

★3 (*fi 6*) (two term, 45 hours). Each student will present to a committee of examiners a Faculty-approved clinical treatment case for the purpose of demonstrating competence in case-history taking including demographic, medical, and dental components; development and implementation of a comprehensive treatment plan; and, a critical evaluation of the actual and proposed treatment outcomes. The evaluation will be influenced by the student's ability to draw on knowledge acquired in all years of the undergraduate program. Appropriate guidelines will be made available to the students.

#### **DENT 485 Radiology**

★0.5 (*fi 1*) (two term, 18 hours). (a) Clinical experience in radiologic interpretation and supervision of auxiliaries in the performance of radiographic film production. (b) Clinical experience in reporting of radiographs in conjunction with diagnosis.

#### **DENT 488 Oral Surgery**

★2 (*fi 4*) (two term, 30 hours). Minor oral surgery leads to teaching of other aspects of oral surgery. Most aspects of oral and maxillofacial surgery are taught in lecture form. Student is also taught to diagnose and refer difficult procedures to the specialist.

#### **DENT 489 Oral Surgery**

★1 (*fi 2*) (two term, 30 hours). Clinical practice of oral surgery continues in fourth year. Student is taught more difficult procedures, e.g. complicated exodontia. Student also gains experience in simple impactions and other minor oral surgery procedures.

#### **DENT 490 Professional Practice Issues**

★2 (*fi 4*) (two term, 30 hours). An introduction to all aspects of ethics, jurisprudence, forensic dentistry, and professional responsibilities and conduct. The legal aspects are presented by members of the Faculty of Law. The forensic dentistry component is based on actual case presentations for the identification of individuals and criminal suspects.

#### **DENT 492 Practice Management**

★2 (*fi 4*) (two term, 30 hours). This course expands on the topics introduced in DENT 442. The fourth-year dental students are given an opportunity to work with practice management concepts such as planning, financial security, monitoring the business profile of a dental practice, analysing contractual agreements, preparing a business plan, maintaining a bookkeeping system, developing a rationale for insurance coverage and investment of surplus funds. Emphasis and evaluation is directed to the degree of skill students will develop in these projects.

#### **DENT 493 Patient Management**

★2 (*fi 4*) (two term, 59 hours). This course provides experience in the comprehensive care and management of all assigned dental patients. Students are expected to plan, prioritize, and coordinate total dental care. Emphasis is placed on infection control, professionalism, booking practices, and documentation skills.

#### **DENT 495 Clinical Practice II**

★14 (*fi 28*) (two term, 420 hours). Students provide clinical dental treatment in a setting that integrates this component into the overall care and management of the patient.

#### **DENT 496 Geriatric Dentistry**

★1 (*fi 2*) (two term, 18 hours). The student will be treating patients in the Youville dental clinic and other hospital departments. The primary objective is to give the student additional experience in providing dental care to well and unwell elderly patients.

#### **DENT 499 Satellite Dental Clinic**

★3 (*fi 6*) (two term, 75 hours). Each student is required to rotate to a dental clinic in Alberta. During this period, students provide comprehensive care to patients attending the clinic. This program provides an environment for students to bridge the gap between private practice and the discipline-oriented educational experience in the Department's dental clinics.

## Graduate Courses

#### **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.

#### **DENT 540 Orthodontic Seminars**

★4 (*fi 8*) (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**

★2 (*fi 4*) (two term, 525 hours). 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 Statistics and Epidemiology**

★1 (*fi 2*) (two term, 30 hours). This course will develop principles of scientific methodology of problem solving, statistical terms and the qualitative and quantitative evaluation of oral disease. (Course offered in alternate years.)

#### **DENT 562 Occlusion**

★2 (*fi 4*) (second term, 75 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 640 Orthodontic Seminars**

★3 (*fi 6*) (two term, 145 hours). Second year seminar and preclinical presentations. Requires successful completion of DENT 540.

#### **DENT 641 Orthodontic Clinics**

★8 (*fi 16*) (two term, 840 hours). Second year applied clinical educational program. Requires successful completion of DENT 541.

#### **DENT 741 Orthodontic Clinics**

★1 (*fi 2*) (first term, 90 hours). Third year applied clinical educational program. Patient treatment needs may require more than the 90 clinical hour minimum for course completion. Requires successful completion of DENT 641.

#### **DENT 800 Special Registration**

★0 (*fi 0*) (either term, unassigned). Dentistry undergraduate students registered in universities other than the University of Alberta and who have been admitted to the University of Alberta Faculty of Medicine and Dentistry as a Visiting Student in accordance with the Faculty guidelines may be required to register in this course for the purpose of entitlement to the University library and registration in the Alberta Dental Association Education Register.

## 201.52 Dentistry, DDS

Department of Oral Health Sciences  
Faculty of Medicine and Dentistry

**Note:** DDS courses are available only to students who entered Year 1 of the DDS or MD programs as of 1998/99.

## Undergraduate Courses

#### **DDS 510 Practice of Dentistry, Part I**

★6 (*fi 12*) (two term, 256 hours). 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.

#### DDS 514 Anatomy (Dental)

★2 (*fi 4*) (either term, 60 hours). Coronal, radicular and pupal morphology of the primary and permanent dentitions.

#### DDS 515 Material Sciences

★1 (*fi 2*) (either term, 15 hours). This course provides a background for the study of materials used in the health professions. The following topics are introduced: atomic structure, bonding, material properties, metals, polymers, ceramics, multiphase materials and corrosion.

#### DDS 516 Occlusion

★2.5 (*fi 5*) (either term, 60 hours). A multidisciplinary didactic program of biomechanical principles of occlusion with a laboratory program in occlusal relationships and instrumentation.

#### DDS 517 Operative

★7 (*fi 14*) (either term, 175 hours). Included will be discussions of basic operating principles; cutting instruments; principles of cavity nomenclature and classification; the principles of cavity preparations along with the manipulation requirements of amalgam and composite resins. Cavity preparations will be cut in artificial and extracted natural teeth and manipulation of both silver amalgam and composite resin will be practiced.

#### DDS 518 Oral Biology I

★4 (*fi 8*) (either term, 60 hours). Development, histology, and comparative anatomy of the craniofacial complex and dental tissues.

#### DDS 519 Radiology

★1 (*fi 2*) (either term, 15 hours). The elementary principles of radiology including the basic electronics, physics and geometry of image formation as well as the photographic basis of image production on film.

#### DDS 520 Practice of Dentistry, Part II

★6 (*fi 12*) (two term, 0-0-8). 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 521 Dental Materials

★2 (*fi 4*) (either term, 30 hours). This course provides indepth discussion of the materials used in dentistry. Topics include gypsum products, impression materials, polymers, restorative resins, dental amalgam, gold casting alloys, waxes, investment materials, casting, porcelain, cements, nonprecious casting alloys, steels, high speed instrumentation, and materials research methodology.

#### DDS 522 Reproductive Medicine and Urology

★2 (*fi 4*) (either term, 7 weeks). A brief overview of the reproductive medicine and urology appropriate for those in the DDS program. Open only to students registered in the DDS program.

#### DDS 523 Musculoskeletal System

★2 (*fi 4*) (two term, 7 weeks). A brief overview of the musculoskeletal system appropriate for those in the DDS program. Open only to students registered in the DDS program.

#### DDS 524 Head and Neck Anatomy

★3 (*fi 6*) (first term, 75 hours). Detailed gross anatomy of the head and neck region in the human. Focus is on structures that are present, their relationship and interaction with each other, and understanding of malfunction. Designed for dental students.

#### DDS 525 Diagnosis

★1 (*fi 2*) (either term, 10 hours). The didactic portion will be a continuation of the study of diagnosis and treatment of local and systemic disease with emphasis upon treatment planning approaches as they relate to specific disciplines, leading to the integration of the various disciplines in the treatment plan. Students will be exposed to a number of mock cases for further experience in diagnosis and treatment planning.

#### DDS 526 Introduction to Diagnosis and Treatment Planning

★1.5 (*fi 3*) (either term, 33 hours). Introduction to the process of diagnosis and treatment planning of comprehensive dental treatment cases. Students will collect data and formulate treatment plans for a varied assortment of clinical patients. Included will be instruction in the nutritional assessment and counselling procedures that form part of patient diagnosis and treatment planning.

#### DDS 527 Endodontics

★2.5 (*fi 5*) (either term, 60 hours). The conservation of pulp-involved and pulpless teeth. Procedures for diagnosis and treatment described, demonstrated and correlated with the related dental and basic sciences. Laboratory practice is on mannequins under simulated clinical conditions.

#### DDS 528 Ethics and Dentistry

★1 (*fi 2*) (either term, 15 hours). To raise the student's level of consciousness concerning the ethics of dental health care and to provide information that will assist them in moral reasoning.

#### DDS 530 Introduction to Clinical Practice

★2 (*fi 4*) (either term, 60 hours). Students will be introduced to the concept of clinical dental treatment beginning with information gathering and organization and progressing to actual treatment delivery as part of a clinical team.

#### DDS 531 Operative Dentistry

★5 (*fi 10*) (either term, 120 hours). A continuation of DDS 517 with emphasis on the use of gold inlays, a continuation of the use of white restoratives, and the use of amalgam with retentive pins. Both natural (extracted) teeth and artificial teeth will be used in practicing the techniques related to gold inlays, white restoratives, and large pin amalgams. There will be an introduction to the clinic where students will prepare and place silver amalgam restorations in patients.

#### DDS 532 Oral Biology II

★4 (*fi 8*) (either 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 533 Oral Pathology

★2 (*fi 4*) (either term, 30 hours). The diagnosis, pathology and treatment of common diseases of the teeth and adjacent structures.

#### DDS 534 Orthodontics

★1 (*fi 2*) (either term, 15 hours). Growth and development of the craniofacial complex, etiology and diagnosis of malocclusion, biological and mechanical principles of tooth movement, orthodontic examination and records.

#### DDS 535 Periodontics

★2.5 (*fi 5*) (either term, 60 hours). Detailed information will be presented pertaining to the fundamental concepts of diagnosis, prevention and treatment of periodontal disease. Material will cover a more in depth view of periodontal disease and the therapies which are available. The role of occlusion as it relates to periodontal tissue will be covered in more depth. Emphasis is on procedural techniques, their indications and contraindications. Students will be introduced to periodontal treatments of patients and develop the skills to diagnose and treat early forms of periodontal disease.

#### DDS 536 Prosthodontics

★5 (*fi 10*) (either term, 120 hours). The didactic portion of the course of the biomechanical considerations in providing extracoronal restorations and fixed prosthesis. Emphasis is placed on problem-solving and development of clinical judgement. The preclinical laboratory component will present the principles of tooth preparation, temporization, impressions and cementation correlated with laboratory fabrications of extracoronal restorations.

#### DDS 537 Radiology

★2 (*fi 4*) (either term, 39 hours). The fundamentals in the interpretation of normal and radiologic signs of disease in the jaws. A systematic review of the radiological evidence of disease in the jaws will also be presented. The laboratory component involves two segments: an introductory experience in production of x-ray films on mannequins and in patients; and an introduction to the interpretation and reporting of dental x-ray films.

#### DDS 538 Sedation and Pain Control

★2 (*fi 4*) (either term, 40 hours). The control of pain in a dental practice. Lectures and labs review the physiology, pharmacology, and clinical practice of providing analgesia and sedation to the dental patient. The primary course content is the safe administration of nitrous oxide/oxygen conscious-sedation with an emphasis on patient monitoring. Intravenous access techniques are taught, and both intravenous sedation and general anesthesia are discussed.

#### DDS 539 Anaesthesia

★1.5 (*fi 3*) (second term, 36 hours). This course deals in the didactic form with local anaesthesia covering anatomy, physiology and pharmacology of different local anaesthetics. Discussion of different armamentarium and techniques forms the major part of the course. Complications which can arise from their use including prevention and treatment are also covered. Local anesthetic techniques covering all types of infiltration and intraoral blocks form the major component of the lab component. Students practice anaesthetic techniques by using each other as patients. Emphasis is on mandibular block and Gow-Gates techniques.

## Courses Beginning in 2000-2001

#### DDS 540 Clinical Practice II (Introduction)

★11 (*fi 22*) (either term, 350 hours). Students will be introduced to the concept of dental care delivery in a multidisciplinary team setting. Comprehensive treatment will be provided to patients, involving disciplines of operative dentistry, prosthodontics, endodontics, and periodontics. Patient and practice management strategies will be reinforced. A two-week rotation to an external clinic may also occur.

**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 542 Dental Implants (Introduction)**

★1 (*fi 2*) (either term, 15 hours). To develop a scientific understanding of the biological basis of implant dentistry and provide a description of its history and current status.

**DDS 544 Diagnosis (DPTC)**

★2 (*fi 4*) (two term, 42 hours). The fundamental principles involved in dental management of the diagnosed medically compromised patient will be discussed by lectures and audiovisual presentation of case examples. Students are assigned to a diagnosis/treatment clinic to further refine skills in collecting and interpreting the dental patient's medical treatment, formulating an accurate diagnosis and rational treatment plan under the supervision and instruction of dentistry staff from various divisions and specialties. Each student will be responsible for personally treating or managing the treatment of assigned patients, one of which will be a medically compromised patient.

**DDS 546 Endodontics**

★3 (*fi 6*) (two term, 83 hours). A continuation of DDS 527 with advanced endodontic considerations, and an introduction to clinical procedures with treatment carried out on selected patients.

**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 548 Operative**

★6 (*fi 12*) (two term, 165 hours). The principles and procedures necessary to successful clinical practice will be emphasized. This is a continuation of DDS 531 in which the material will be covered in more depth and oriented specifically to dealing with patients rather than just in a laboratory situation. All the materials used in operative dentistry will be included in the discussions but special emphasis will be given to white restorations. The majority of the time will be clinical practice on patients to allow the students to further develop operative skills. All appropriate materials including silver amalgam, gold, and tooth colored materials will be used within a properly maintained operating environment.

**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 550 Oral Surgery**

★3 (*fi 6*) (either term, 60 hours). This course covers the diagnosis and treatment of basic principles of oral surgery. The student is introduced to the science of exodontia and related subjects. This course also covers other minor oral surgery procedures, e.g. biopsy technique, preprosthetic surgery. Clinical practice of exodontia with assisting introduced. Use of different instruments for oral surgery are emphasized. Suturing techniques and use of different forceps for extraction are taught in this course.

**DDS 551 Orthodontics**

★4.5 (*fi 9*) (two term, 114 hours). Diagnosis and treatment options, cephalometric eruption guidance and interceptive procedures, introduction to bonding/banding techniques. Fabrication of some common orthodontic appliances, clinical cases for treatment planning and care, orthodontic screening cases, molar uprighting cases if available, some functional appliance cases.

**DDS 552 Patient Management**

★2 (*fi 4*) (two term, 60 hours). This course provides experience in the comprehensive care and management of assigned dental patients. Students are expected to plan, prioritize, and coordinate the delivery of dental care for their patients while practicing proper infection control techniques.

**DDS 553 Pediatric Dentistry**

★5 (*fi 10*) (two term, 120 hours). The lecture course deals with treatment and management of the adolescent patient as well as space maintainers, preventive and interceptive orthodontics, fluorides in caries prevention and management of traumatic tooth injuries. Introduction to clinical dental diagnosis and treatment of children and adolescents.

**DDS 554 Periodontics**

★4.5 (*fi 9*) (two term, 120 hours). A continuation of the previous year which expands and gives a more in-depth view of periodontal disease and available therapies. Emphasis is on the surgical techniques as methods for treating periodontal disease. Continues to involve the treatment of patients. Emphasis is

on the initial preparatory phase of therapy, showing more versatility in the types of periodontal treatments and how these are interrelated with other dental disciplines. The student will develop the skills to diagnose and to treat moderate forms of periodontal disease and be able to learn how to integrate these treatments into a general dentistry practice.

**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 on a dentist in today's society.

**DDS 556 Prosthodontics (Fixed)**

★7 (*fi 14*) (two term, 180 hours). A didactic course of the biological considerations in providing extracoronary restorations and fixed prosthesis. Emphasis is placed on treatment planning. Laboratory instruction is esthetic considerations of ceramic veneers. The clinical component requires a designated number of extracoronary restorations to be completed.

**DDS 557 Prosthodontics (REM)**

★7 (*fi 14*) (two term, 180 hours). A lecture/audiovisual series emphasizing the biological principles of complete denture construction. Prosthodontic pathology, relines, resilient liners, partial dentures, overdentures, immediate dentures and related nutritional concerns are presented. The clinical experience is in all treatment phases of basic removable prosthodontics.

**DDS 558 Radiology**

★0.5 (*fi 1*) (two term, 12 hours). Ongoing clinical experience in radiographic film production and the reporting of radiographs on clinical patients.

**DDS 572 Sedation and Pain Control**

★2 (*fi 4*) (second term, 40 hours). The control of pain in a dental practice. Lectures and labs review the physiology, pharmacology, and clinical practice of providing analgesia and sedation to the dental patient. The primary course content is the safe administration of nitrous oxide/oxygen conscious-sedation with an emphasis on patient monitoring. Intravenous access techniques are taught, and both intravenous sedation and general anesthesia are discussed.

**Courses Beginning in 2001-2002****DDS 560 Clinical Practice II**

★14 (*fi 28*) (two term, 420 hours). Students provide clinical dental treatment in a setting that integrates this component into the overall care and management of the patient.

**DDS 562 Dental Implants**

★1 (*fi 2*) (either term, 15 hours). To understand the factors involved in patient selection, referral, diagnosis and treatment planning in dental implantology and to understand the stages and methods of treatment, the complications and remedies as well as maintenance procedures.

**DDS 564 Dental Therapeutics**

★1 (*fi 2*) (either term, 15 hours). Lectures will be presented on the following topics: pharmacology and therapeutics, prescription writing, drug schedules and interactions, cardiovascular, geriatric, hemostasis and nutritional considerations, desensitizing agents, sterilization and disinfection, and other agents used in practice.

**DDS 566 Diagnostic Case Evaluation**

★1.5 (*fi 3*) (two term, 45 hours). Each student will present to a committee of examiners a Department-approved clinic treatment case for the purpose of demonstrating competence in case-history taking including demographic, medical, and dental components; development and implementation of a comprehensive treatment plan; and, a critical evaluation of the actual and proposed treatment outcomes. The evaluation will be influenced by the student's ability to draw on knowledge acquired in all years of the undergraduate program. Appropriate guidelines will be made available to the students.

**DDS 568 Endodontics**

★3 (*fi 6*) (two term, 66 hours). A continuation of DDS 546 with application to clinic practice. Endodontic treatment will be carried out on selected patients. Endodontics cases treated by the student will be presented to a small group in a seminar setting for discussion and evaluation.

**DDS 569 Hospital/Geriatric Dentistry**

★3 (*fi 6*) (two term, 80 hours). A two-week period of hospital training senior students where they become familiar with hospital protocol and operating room procedures, observe oral surgery and anesthesia, attend other medical and dental clinics, perform physical evaluation of patients and provide emergency dental care and patient treatment services. An experience in a Geriatric Treatment Hospital will be provided.

**DDS 570 Oral Medicine and Pathology**

★3 (*fi 6*) (two term, 74 hours). The oral manifestations of local and systemic diseases are presented in a conference setting. Students are given specific

teaching cases to which they apply a rational approach to clinical differential diagnosis and case management. They further apply their skills in assessing and managing patients through rotations in the Screening and Emergency clinic.

#### DDS 571 Oral Surgery

★3 (*fi 6*) (two term, 60 hours). Minor oral surgery leads to teaching of other aspects of oral surgery. Most aspects of oral and maxillofacial surgery are taught in lecture form. Student is also taught to diagnose and refer difficult procedures to the specialist. Clinical practice of oral surgery continues in fourth year. Student is taught more difficult procedures, e.g. complicated exodontia. Student also gains experience in simple impaction and other minor oral surgery procedures.

#### DDS 573 Orthodontics

★4 (*fi 8*) (two term, 90 hours). Treatment planning, treatment options and appliance mechanism for a variety of clinical situations and malocclusions. Clinical experience, involving preventive, interceptive and simple treatment of orthodontic problems of particular concern to the general practitioner, is designed to enable the student to apply knowledge acquired in the lectures and laboratory.

#### DDS 574 Patient Management

★2 (*fi 4*) (two term, 59 hours). This course provides experience in the comprehensive care and management of all assigned dental patients. Students are expected to plan, prioritize, and coordinate total dental care. Emphasis is on infection control, professionalism, booking practices, and documentation skills.

#### DDS 575 Pediatric Dentistry

★3.5 (*fi 7*) (two term, 90 hours). A seminar format course in which current and/or significant dental literature in pediatric dentistry will be presented and discussed by students and moderated by the instructor. Two to four guest lecture hours may also be included on topics of interest. A clinical course designed to provide the student with the diagnosis, treatment and management of children and adolescents with more complex dental needs. The use of nitrous oxide analgesia is demonstrated on select cases.

#### DDS 576 Periodontics

★3 (*fi 6*) (two term, 75 hours). Students will further expand their skills in diagnosis and treatment of advanced cases of periodontal disease by means of periodontal surgery. Patient's treatment progress will be assessed by recall checks. Emphasis will be on interdisciplinary treatment approaches for handling patients' dental problems.

#### DDS 577 Practice Management

★2 (*fi 4*) (two term, 30 hours). This course expands on the topics introduced in DDS 555. The fourth-year dental students are given an opportunity to work with practice management concepts such as planning, financial security, monitoring the business profile of a dental practice, analyzing contractual agreements, preparing a business plan, maintaining a bookkeeping system, developing a rationale for insurance coverage and investment of surplus funds. Emphasis and evaluation is directed to the degree of skill students will develop in these projects.

#### DDS 578 Professional Practice Issues

★2 (*fi 4*) (two term, 30 hours). An introduction to all aspects of ethics, jurisprudence, forensic dentistry, and professional responsibilities and conduct. The legal aspects are presented by members of the Faculty of Law. The forensic dentistry component is based on actual case presentations for the identification of individuals and criminal suspects.

#### DDS 579 Radiology

★1.5 (*fi 3*) (two term, 33 hours). Clinical experience in a radiologic interpretation and supervision of auxiliaries in the performance of radiographic film production. Clinical experience in reporting of radiographs in conjunction with diagnosis.

#### DDS 580 Satellite Dental Clinic

★3 (*fi 6*) (two term, 80 hours). Each student is required to rotate to a dental clinic in Alberta. During this period, students provide comprehensive care to patients attending the clinic. This program provides an environment for students to bridge the gap between private practice and the discipline-oriented educational experience in the Department's dental clinics.

## 201.53 Dentistry/Medicine, DMED

Department of Oral Health Sciences  
Faculty of Medicine and Dentistry

**Note:** DMED courses are available only to students who entered Year 1 of the DDS or MD programs as of 1998/99.

### Undergraduate Courses

#### DMED 511 Introduction to Medicine and Dentistry

★3 (*fi 6*) (either term, 5 weeks). An introduction to the basic health sciences 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, 7 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, 13 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.

#### DMED 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 or DDS program.

#### DMED 524 Neurosciences

★9 (*fi 18*) (either term, 11 weeks). This is a course in fundamental Clinical Neurosciences that is taught in an integrated fashion. The course 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 MD or DDS program.

#### DMED 525 Oncology

★3 (*fi 6*) (either term, 4 weeks). Principles and concepts of clinical oncology. Open only to students registered in the MD or DDS program.

## 201.54 Design, DES

Department of Art and Design  
Faculty of Arts

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

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

### Undergraduate Courses

#### DES 268 Introduction to Studio

★3 (*fi 6*) (first term, 0-6L-0). Directed study in one subject embraced by DES 370 or DES 390. Prerequisites: ART 131, or 132, and consent of Department. Note: Restricted to students in the Faculty of Education only. Formerly DES 368.

#### 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 131 or 132 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 131 or 132 and consent of Department.

#### DES 370 Foundations of Industrial Design

★6 (*fi 12*) (two 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 practical, hands-on projects combining theory and practice in two and three dimensions. Prerequisites: ART 131 or ART 132 and consent of Department. Formerly DES 372.

#### DES 375 Introduction to Visual Presentation (Non-Electronic)

★3 (*fi 6*) (first term, 0-6L-0). Introductory studies in model and graphic-based projects implementing the materials and processes of traditional visualization methods and media. Prerequisites or corequisites: DES 370 and consent of Department.

#### DES 376 Introduction to Visual Presentation (Electronic)

★3 (*fi 6*) (second term, 0-6L-0). Introductory studies in computer-aided design in 2-D and 3-D provide exposure to state-of-the-art hardware and software for design development. Projects will be linked to studio-based actual material models. Prerequisites or corequisites: DES 370 and consent of Department.

#### DES 390 Foundations of Visual Communication Design

★6 (*fi 12*) (two term, 0-6L-0). Introduction to the principles, methods and techniques 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. Prerequisites: ART 131 or ART 132 and consent of Department. Formerly DES 392.

#### **DES 395 Introduction to Form, Visual Elements and Systems**

★3 (*fi 6*) (either 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. Prerequisites or corequisites: DES 390 and consent of Department.

#### **DES 396 Introduction to Research and Theory in Design**

★3 (*fi 6*) (either 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. Prerequisites or corequisites: DES 390 and consent of Department.

#### **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 390. 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.

#### **DES 470 Intermediate Industrial Design Principles and Practices**

★6 (*fi 12*) (two term, 0-6L-0). Subject areas include research methods and the design process; 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 370 and consent of Department.

#### **DES 475 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. Prerequisites or corequisites: DES 470 and consent of Department.

#### **DES 476 Product Design Principles and Practices II**

★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. Prerequisites or corequisites: DES 470 and consent of Department.

#### **DES 477 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 or corequisite: DES 470 and consent of Department.

#### **DES 478 Furniture Design Principles and Practices II**

★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. Prerequisites or corequisites: DES 470 and consent of Department.

#### **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.

#### **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. Prerequisites: DES 370 and DES 390 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. Prerequisites: DES 370 and DES 390 and consent of Department. Note: Not open to students with credit in DES 482.

#### **DES 490 Concepts and Systems in Visual Communication Design**

★6 (*fi 12*) (two term, 0-6L-0). Systematic approaches to typographic, graphic and diagrammatic communication, image creation and manipulation. Introduction to the computer as a tool for language and visual communication. Black and white photography. Project management and research. Prerequisites: DES 390 and consent of Department. Formerly DES 492.

#### **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 490 and consent of Department.

#### **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. Prerequisites or corequisites: DES 490 and consent of Department.

#### **DES 497 Advanced Typography**

★3 (*fi 6*) (either 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. Prerequisite or corequisite: DES 490 and consent of Department.

#### **DES 498 Information Design**

★3 (*fi 6*) (either term, 0-6L-0). Text, tables, charts, diagrams and electronic displays. User-machine interaction: perception and cognition. Visual presentation of abstract and quantitative information. Prerequisite or corequisite: DES 490 and consent of Department.

#### **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 570 The Practice of Industrial Design**

★6 (*fi 12*) (two term, 0-6L-0). Subject areas include design and culture; human factors; social, environmental and economic implications of design; appropriate technologies; production considerations; product marketing and case studies; design and project management; professional, business and legal implications. Projects may be realized in any or all available media. Prerequisites: DES 470 and consent of Department.

#### **DES 575 Product Design Applications and Product Technologies**

★3 (*fi 6*) (either 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 Computer Aided Manufacturing will be the focus of at least one project. Prerequisites or corequisites: DES 570 and consent of Department.

#### **DES 576 Furniture Design Applications and Production Technologies**

★3 (*fi 6*) (either 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 Computer Aided Manufacturing will be the focus of at least one project. Prerequisites or corequisites: DES 570 and consent of Department.

#### **DES 577 Product and Furniture Design Systems**

★3 (*fi 6*) (either term, 0-6L-0). A seminar/studio based course that focuses on systems analysis and application in product and furniture design. With a special regard for the economics of manufacture and marketing. Prerequisite or corequisite: DES 570 and 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 590 The Practice of Graphic Design**

★6 (fi 12) (two 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 490 and consent of Department. Formerly DES 592.

**DES 595 Communication Design for Interactive Media I**

★3 (fi 6) (first 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. Prerequisites or corequisites: DES 590 and consent of department.

**DES 596 Communication Design for Interactive Media II**

★3 (fi 6) (second 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. Prerequisites: DES 592 and consent of Department. Corequisite: DES 590.

**DES 597 Design Management**

★3 (fi 6) (either 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 590 and consent of Department.

**Graduate Courses****DES 640 Drawing: Concepts, Analysis and Criticism**

★10 (fi 20) (either term, 0-18L-0).

**DES 641 Drawing: Development of Concepts, Analysis and Criticism**

★10 (fi 20) (either term, 0-18L-0).

**DES 672 Industrial Design: Concepts, Analysis and Criticism**

★10 (fi 20) (either term, 0-18L-0).

**DES 673 Industrial Design: Conceptual Analysis and Practical Applications**

★10 (fi 20) (either term, 0-18L-0).

**DES 675 Industrial Design: Directed Readings**

★3 (fi 6) (either term, 0-3s-0).

**DES 692 Visual Communication Design: Concepts, Analysis and Criticism**

★10 (fi 20) (either term, 0-18L-0).

**DES 693 Visual Communication Design: Conceptual Analysis and Practical Applications**

★10 (fi 20) (either term, 0-18L-0).

**DES 695 Visual Communication Design: Directed Readings**

★3 (fi 6) (either term, 0-3s-0).

**201.55 Drama, DRAMA**

Department of Drama  
Faculty of Arts

**Undergraduate Courses****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. This course requires the payment of additional miscellaneous fees. See §22.2.3 for details. Formerly DRAMA 202.

**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. Formerly DRAMA 201.

**DRAMA 149 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. Note: Designed for students with little or no previous background in Drama. Not to be taken by BA Drama majors or students with credit in DRAMA 391. Formerly DRAMA 249.

**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 and BFA (Technical Theatre: Stage Management). Not to be taken by students with credit in DRAMA 149, 249, or 350.

**DRAMA 191 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: consent of Department. Note: Formerly DRAMA 291. Not to be taken by BA Drama majors or by students with credit in 291.

**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. Not normally to be taken by BA Drama majors. Note: Not open to students with credit in DRAMA 243, 245, 341 and 342. Formerly DRAMA 347.

**DRAMA 303 History of Canadian Theatre from its Origin to 1967**

★3 (fi 6) (either term, 3-0-0). A survey of the evolution of theatre art in French and English Canada with reference to the actors, directors, playwrights, spaces and major trends in the Canadian theatre, from the 17th century until 1967.

**DRAMA 304 History of the Theatre**

★6 (fi 12) (two term, 3-0-0). The development of the styles and crafts of the mise-en-scène, and of the relationship between the playing space and the audience, from the ancient Greek theatre to the end of the nineteenth century.

**DRAMA 325 Creative Process and the Theatre Artist**

★3 (fi 6) (either term, 0-4L-0). Theory and practice of the creative process of theatre arts emphasizing its interdisciplinary nature and the development of human resources. Note: Not open to students with credit in DRAMA 321. Prerequisite: DRAMA 149 or 350 or consent of Department.

**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 353 or consent of the Department.

**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 336 Beginning Movement I**

★3 (fi 6) (first term, 0-8L-0). Beginning techniques in ballet for the actor; initial exploration of creative forms of movement. Note: Restricted to BFA (Acting) students.

**DRAMA 338 Beginning Movement II**

★3 (fi 6) (second term, 0-8L-0). Development of posture, flexibility and strength of body; investigation of the physical self in characterization. Prerequisite: DRAMA 336. Note: Restricted to BFA (Acting) students.

**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 346 Voice and Speech I**

★3 (fi 6) (first term, 0-6L-0). Introduction to voice and speech improvement; oral interpretation; singing. Note: Restricted to BFA (Acting) students.

**DRAMA 348 Voice and Speech II**

★3 (fi 6) (second term, 0-6L-0). Exploration of the voice for characterization; oral interpretation of forms of literature; singing. Prerequisite: DRAMA 346. Note: Restricted to BFA (Acting) students.

**DRAMA 353 Scene Study I**

★3 (fi 6) (either term, 0-6L-0). The study of acting, including the analysis and enactment of scripted scenes, and characterization. Prerequisites: DRAMA 149 or 150 and consent of Department.

**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 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 359 Improvisational Workshop**

★3 (fi 6) (either term, 0-6L-0). Practice in the preparation and application of



improvisation to the exploration and creation of dramatic form. Prerequisites: DRAMA 149, 150 or 350, and consent of Department.

#### **DRAMA 360 Elements of Playwriting**

★6 (*fi 12*) (two term, 0-4L-0). Study of and practice in creating the elements of a play. Prerequisites: ENGL 101 or its equivalent, and consent of Department.

#### **DRAMA 370 Theatre Design I**

★6 (*fi 12*) (two term, 0-6L-0). Study and practice of design for the theatre. Restricted to BFA (Design) students.

#### **DRAMA 371 Studio Techniques for Theatre Design**

★6 (*fi 12*) (two term, 0-6L-0). Study and practice of the studio techniques employed in theatre design. Note: Formerly DRAMA 271. Not open to students with credit in DRAMA 271. Prerequisite: consent of Department.

#### **DRAMA 372 Production Techniques—Lighting**

★6 (*fi 12*) (two term, 0-6L-0). Foundation studies in the planning and practice of lighting design. Prerequisite: consent of Department.

#### **DRAMA 374 Design and Stagecraft for Actors**

★3 (*fi 6*) (first term, 0-3L-0). Aspects of design and production theory, techniques, and practice as they affect the actor in performance.

#### **DRAMA 375 History of Decor and Dress**

★6 (*fi 12*) (two term, 3-0-0). A survey of style in western civilization. Prerequisite: consent of Department. Note: Not open to students with credit in CL TX 304 and 403.

#### **DRAMA 378 Basic Design**

★6 (*fi 12*) (two term, 0-6L-0). A studio course in design to obtain a basic grasp of design techniques for setting and costume. Prerequisite: consent of Department. Note: Formerly DRAMA 373 and 377. Not to be taken by students with credit in DRAMA 272 or 373 or 377.

#### **DRAMA 379 Introduction to Stagecraft and Design**

★3 (*fi 6*) (either term, 3-0-0). Introductory lectures in production techniques, construction, mechanics, lighting and design. Note: Not to be taken by students with credit in DRAMA 376. Formerly DRAMA 376.

#### **DRAMA 383 Introduction to Directing**

★3 (*fi 6*) (either term, 0-6L-0). Fundamentals of directing explored through practical exercises. Prerequisites: DRAMA 370 or 378, or 353 and 379, and/or consent of the Department.

#### **DRAMA 390 Production Crew I**

★3 (*fi 6*) (either term, 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 379 or consent of Department. Note: Not to be taken by students with credit in DRAMA 191, 291, or 378. Formerly DRAMA 378.

#### **DRAMA 392 Production Lab II**

★3 (*fi 6*) (either term, 0-0-6). Production experience in stage managing and/or technical theatre with qualified technical experts. Prerequisites: DRAMA 191, 378, 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 396 Stage Management I**

★6 (*fi 12*) (two term, 0-6L-0). Introduction to the fundamentals of stage management addressing the preparation, rehearsal, and running stages of production. Note: Restricted to BFA (Technical Theatre: Stage Management) students.

#### **DRAMA 397 Stagecraft**

★6 (*fi 12*) (two term, 0-9L-0). The study of theatrical production techniques, construction, and mechanics. Note: Restricted to BFA (Technical Theatre: Technical Production) students.

#### **DRAMA 398 Basic Costume Construction and Fabric Properties**

★6 (*fi 12*) (two term, 0-9L-0). The study of basic costume construction techniques, flat pattern drafting, draping, and fabric properties. Note: Restricted to BFA (Technical Theatre: Costume) 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 403 Modern Canadian Theatre**

★3 (*fi 6*) (either term, 3-0-0). Survey of modern Canadian theatre.

#### **DRAMA 405 Third Year Honors Seminar**

★2 (*fi 4*) (either term, 0-1s-0). Offered over a full session.

#### **DRAMA 407 Practical Studies in Drama**

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

#### **DRAMA 408 Modern Theatre**

★3 (*fi 6*) (first term, 3-0-0). Survey of major plays and theatre artists of the 20th Century particularly those of Europe and North America. Formerly part of DRAMA 400. Not to be taken by students with credit in DRAMA 400.

#### **DRAMA 409 Contemporary Theatre**

★3 (*fi 6*) (second term, 3-0-0). Exploration of issues and trends of theatre movements which form the mosaic of contemporary theatre. Formerly part of DRAMA 400. Not to be taken by students with credit in DRAMA 400.

#### **DRAMA 425 Theatre for Young Audiences**

★3 (*fi 6*) (either term, 0-6L-0). Theory and practice of theatre for young audiences including participatory techniques. Prerequisites: DRAMA 323 or 353, and consent of Department.

#### **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 436 Theatre Movement I**

★3 (*fi 6*) (first term, 0-8L-0). Study of, and practice in, styles of movement and dance, both period and contemporary. Prerequisite: DRAMA 338. Note: Restricted to BFA (Acting) students.

#### **DRAMA 438 Theatre Movement II**

★3 (*fi 6*) (second term, 0-8L-0). Projects in styles and choreography. Prerequisite: DRAMA 436. Note: Restricted to BFA (Acting) students.

#### **DRAMA 442 Studies in Oral Interpretation**

★3 (*fi 6*) (either term, 0-6L-0). Intensive work in the oral expression of poetry, prose and dramatic literature. Prerequisites: DRAMA 247 or DRAMA 342 and consent of Department.

#### **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 446 Advanced Voice and Speech I**

★3 (*fi 6*) (first term, 0-6.5L-0). Extension of the voice; vocal characterization; sight reading; singing. Prerequisite: DRAMA 348. Note: Restricted to BFA (Acting) students.

#### **DRAMA 448 Advanced Voice and Speech II**

★3 (*fi 6*) (second term, 0-6.5L-0). Oral interpretation of period dramatic forms; singing. Prerequisite: DRAMA 446. Note: Restricted to BFA (Acting) students.

#### **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 453 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 353 and 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. Prerequisite: DRAMA 453 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). Practice in the preparation and presentation of collective creation. Prerequisite: DRAMA 359, and/or consent of Department. DRAMA 327 recommended.

#### **DRAMA 460 Playwriting**

★6 (*fi 12*) (two term, 0-4L-0). The theory and practice of writing for dramatic media: stage, film, radio, and television. Prerequisite: DRAMA 360 and/or consent of Department.

#### **DRAMA 470 Theatre Design II**

★6 (*fi 12*) (two term, 0-6L-0). Further study and practice of design for the theatre. Prerequisite: DRAMA 370. Note: Restricted to BFA (Design) students.

#### **DRAMA 471 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 (Design) and BFA (Technical Theatre) students. Note: Not open to students with credit in DRAMA 270.

**DRAMA 472 Production Techniques: Costume**

★6 (*fi 12*) (two term, 0-6L-0). Theory and techniques of stage costuming. Prerequisite: consent of Department.

**DRAMA 473 Design Assistantship I**

★3 (*fi 6*) (two term, 0-0-6). Practical experience in assisting the designer. Corequisite: DRAMA 470. Note: Restricted to BFA (Design) students. Formerly DRAMA 493. Not to be taken by students with credit in DRAMA 493.

**DRAMA 476 Production Design I**

★3 (*fi 6*) (two term, 0-0-6). Practical experience in designing an element or elements of a production. Restricted to BFA (Design) students. Not open to students with credit in DRAMA 470.

**DRAMA 479 Stagecraft Methodology**

★3 (*fi 6*) (first term, 2-0-0). Studies in stagecraft methods. Note: Restricted to BFA (Design) and BFA (Technical Theatre) students.

**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 383 and consent of Department.

**DRAMA 490 Production Crew II**

★3 (*fi 6*) (either term, 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 491 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 (Design) and 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, 378, or 391 and/or consent of Department.

**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 496 Stage Management II**

★6 (*fi 12*) (two term, 0-6L-0). Study of stage management practice as it applies to different types of production (i.e., Children's Theatre, Legitimate Theatre, Collective, Musical Theatre, Opera, Ballet, etc.). Prerequisite: DRAMA 396. Note: Restricted to BFA (Technical Theatre: Stage Management) students. Repeatable (to be taken two years in succession).

**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 498 Costume Workshops**

★6 (*fi 12*) (two term, 0-10L-0). Costume production techniques and practice (i.e., health and safety, fabric dyeing and painting, distressing, millinery, body padding, leather work, corset construction, wigs, masks tailoring, decorative techniques, etc.). Prerequisite: DRAMA 398. Note: Restricted to BFA (Technical Theatre: Costume) 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 502 Seminar in Modern Canadian Theatre**

★3 (*fi 6*) (either term, 0-3s-0). Exploration of developments in Modern Canadian drama and theatre production.

**DRAMA 503 Fourth Year Honors Seminar**

★2 (*fi 4*) (two term, 0-1s-0). Note: Formerly part of DRAMA 505.

**DRAMA 505 Tutorial Fourth-Year Honors Essay**

★6 (*fi 12*) (two term, unassigned). Preparation of the Honors essay under the guidance of a member of the Department.

**DRAMA 507 Senior Projects**

★3 (*fi 6*) (either term, 0-5L-0). Prerequisite: consent of Department.

**DRAMA 508 Historical Approaches to Dramatic and Theatrical Critical Theory**

★3 (*fi 6*) (first term, 3-0-0). A survey of the major critical aesthetic theories as they relate to theatre and drama from Aristotle to Modernism. Prerequisite: consent of Department. Formerly part of DRAMA 500. Not to be taken by students with credit in DRAMA 500.

**DRAMA 509 Contemporary Approaches to Dramatic and Theatrical Critical Theory**

★3 (*fi 6*) (second term, 0-3s-0). Exploration of selected contemporary approaches

to dramatic and theatrical critical theory. Prerequisite: DRAMA 508 or consent of Department. Formerly part of DRAMA 500. Not to be taken by students with credit in DRAMA 500.

**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 576 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 (Design) and graduate 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 595 Professional and Critical Orientation**

★0 (*fi 4*) (two term, 2-0-0). A non-credit course required for graduation. Note: Restricted to BFA (Drama) students.

**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 570 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: DRAMA 470. Note: Restricted to BFA and qualifying graduate (Design) students.

**DRAMA 571 Portfolio**

★6 (*fi 12*) (two term, 0-4L-0). Presentation, audition, director/designer dialogue and the business nature of the design profession.

**DRAMA 572 Production Techniques: Scenery**

★6 (*fi 12*) (two term, 0-6L-0). Theory and techniques of the texturing and painting of scenery. Prerequisite: consent of Department. Note: Not to be taken by students with credit in DRAMA 575. Formerly DRAMA 575.

**DRAMA 573 Design Assistantship II**

★6 (*fi 12*) (two term, 0-0-6). Practical experience in assistant designing. Corequisite: DRAMA 570. Note: Restricted to BFA and qualifying graduate (Design) students. Not to be taken by students with credit in DRAMA 593. Formerly DRAMA 593.

**DRAMA 574 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. Prerequisites or corequisites: DRAMA 372, 472, or 572. This course may be taken more than once for credit.

**DRAMA 601 Methods and Tools of Research**

★0 (*fi 2*) (either term, 1-0-0).

**DRAMA 604 Research in Theatre History**

★3-6 (*variable*) (variable, 3-0-0). Research in aspects of physical theatre and production.

**DRAMA 605 Special Projects in Theatre**

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

**DRAMA 607 Dramaturgy I**

★3 (*fi 6*) (either term, 3-0-0).

**DRAMA 610 Applied Criticism**

★3 (*fi 6*) (either term, 3-0-0). Critical analysis of theatre practice.

**DRAMA 621 Research Seminar I**

★3 (*fi 6*) (first term, 0-3s-0). Selected topics in Theory and Criticism. Note: Not to be taken by students with credit in DRAMA 608.

**DRAMA 622 Research Seminar II**

★3 (*fi 6*) (second term, 0-3s-0). Selected topics in Theory and Criticism. Note: Not to be taken by students with credit in DRAMA 608.

**DRAMA 623 Research Seminar III**

★3 (*fi 6*) (first term, 0-3s-0). Selected topics in Theatre History and Theatrical Theory. Note: Not to be taken by students with credit in DRAMA 618.

**DRAMA 624 Research Seminar IV**

★3 (*fi 6*) (second term, 0-3s-0). Selected topics in Theatre History and Theatrical Theory. Note: Not to be taken by students with credit in DRAMA 618.

**DRAMA 625 Research in Canadian Drama I**

★3 (*fi 6*) (first term, 0-3s-0). Research in selected topics related to Canadian Drama. Note: Not to be taken by students with credit in DRAMA 616.

**DRAMA 626 Research in Canadian Drama II**

★3 (*fi 6*) (second term, 0-3s-0). Research in selected topics related to Canadian Drama. Note: Not to be taken by students with credit in DRAMA 616.

**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 660 Playwriting Projects**

★6 (*fi 12*) (two term, 0-0-3). Prerequisite: consent of Department.

**DRAMA 661 Advanced Playwriting Projects**

★6 (*fi 12*) (two term, 0-0-3).

**DRAMA 665 Special Projects in Dramatic Writing**

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

**DRAMA 670 Advanced Theatre Design I**

★6 (*fi 12*) (two term, 0-6L-0). Note: Restricted to MFA (Drama) students.

**DRAMA 671 Advanced Theatre Design II**

★6 (*fi 12*) (two term, 0-6L-0). Note: Restricted to MFA (Drama) students.

**DRAMA 672 Theatre Design III**

★3 (*fi 6*) (two term, 0-4L-0). Corequisites: DRAMA 660, 661, 680 or 681. Note: Restricted to MA (Drama) students (with consent of department) and MFA (Drama) students.

**DRAMA 673 Advanced Lighting Design**

★3 (*fi 6*) (two term, 0-6L-0). Restricted to MFA (Drama) students.

**DRAMA 674 Advanced Costume Techniques**

★3 (*fi 6*) (two term, 0-6L-0). Restricted to MFA (Drama) students.

**DRAMA 675 Advanced Scenepainting**

★3 (*fi 6*) (two term, 0-6L-0). Note: A single-term course offered over the full session. Restricted to MFA (Drama) Students.

**DRAMA 676 Production Design III**

★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 the full session. Restricted to MFA (Drama) Students. Repeatable.

**DRAMA 680 Styles of Directing**

★6 (*fi 12*) (two term, 0-3s-6). Note: Restricted to MFA (Drama) students.

**DRAMA 681 Advanced Projects in Directing**

★6 (*fi 12*) (two term, 0-3s-6). Note: Restricted to MFA (Drama) students.

**DRAMA 690 Topics in Applied Theatre Aesthetics**

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

The following table lists courses renumbered effective 1997/98:

Old	New	Old	New
GEOG 150	EAS 190	GEOG 322	EAS 392
GEOG 151	EAS 191	GEOG 359	EAS 292

**Q EAS 190 Spatial Organization of Human Activity**

★3 (*fi 6*) (either term, 3-0-0). Introduction to the concepts of relative location, spatial interaction and spatial organization of human activity in both rural and urban settings; geographical theories and techniques. Not available to students with credit in GEOG 150.

**Q EAS 191 Cultures, Landscapes and Societies**

★3 (*fi 6*) (either term, 3-0-0). The significance of human distribution on the earth. People's relationship to the physical environment and development of cultural landscapes. Population issues, settlements, cultural patterns, and processes. Not available to students with credit in GEOG 151.

**Q EAS 290 Human Impacts on the Environment**

★3 (*fi 6*) (either term, 3-0-0). Introduction to geographical concepts concerning global aspects of environmental impacts and problems affecting human-environmental relations. Prerequisite: One of EAS 101, 102, 190, 191, 201 or 210. Not available to students with credit in GEOG 264.

**Q EAS 291 Human Use of Resources**

★3 (*fi 6*) (either term, 3-0-0). Geographic perspective on components and characteristics of renewable and non-renewable natural resources, including their physical and spatial aspects, transportation, environmental impacts, use, conservation, and depletion. Prerequisite: One of EAS 101, 102, 190, 191, 201 or 210. Not available to students with credit in GEOG 262.

**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: EAS 190, 191 or one social science core course in the Faculty of Arts.

**Q EAS 391 Introduction to Environmental Planning**

★3 (*fi 6*) (either term, 3-0-0). Introduction to issues in policy making, planning and management related to human interaction with the physical environment. Prerequisite: Any EAS 29X course.

**Q 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 EAS 29X course and one of EAS 220, PSYCO 211, SOC 210 or STAT 141. Not available to students with credit in GEOG 322.

**EAS 394 Issues In Human Geography**

★3 (*fi 6*) (either term, 3-0-0). Theory and application of contemporary issues in human geography. Prerequisites: Any EAS 29X course.

**Q 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: Any EAS 39X course or consent of Instructor.

**Q EAS 492 Geographical Information Systems for Social Science**

★3 (*fi 6*) (either term, 3-0-0). 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. Not available to students with credit in GEOG 428.

**Q EAS 493 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. Prerequisite: Any EAS 3XX course or consent of Instructor.

**EAS 494 Environment and Health**

★3 (*fi 6*) (either term, 3-0-0). This courses addresses topics such as health effects of natural, built and social environments and health impacts of global change. Prerequisite: consent of Instructor. Offered in alternate years.

**EAS 497 Directed Study in Human Geography I**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: Any EAS 39X course.

**EAS 498 Directed Study in Human Geography II**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: EAS 497.

## 201.56 Earth and Atmospheric Sciences, EAS

Department of Earth and Atmospheric Sciences  
Faculty of Science

### Undergraduate Courses

#### 201.56.1 Faculty of Arts Courses

**Note:** See Also INT D 451 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.

## 201.56.2 Faculty of Science Courses

The following table lists courses renumbered effective 1997/98:

Old	New	Old	New
GEOG 130/102	EAS 101	GEOG 442	EAS 422
GEOG 131	EAS 102	GEOG 421	EAS 424
GEOG 103	EAS 103	GEOG 424	EAS 430
GEOG 119	EAS 110	GEOG 427	EAS 431
GEOG 200	EAS 200	GEOG 428	EAS 432
GEOG 201	EAS 201	GEOG 432	EAS 433
GEOG 204	EAS 203	GEOG 433	EAS 434
GEOG 236	EAS 204	GEOG 470	EAS 435
GEOG 207	EAS 205	GEOG 443	EAS 436
GEOG 208	EAS 206	GEOG 427	EAS 451
GEOG 209	EAS 207	GEOG 445	EAS 453
GEOG 205	EAS 209	GEOG 437	EAS 454
GEOG 290/292	EAS 210	GEOG 438	EAS 455
GEOG 220	EAS 220	METEO 430	EAS 470
GEOG 221	EAS 222	METEO 434	EAS 471
GEOG 230	EAS 224	GEOG 502/503	EAS 520
GEOG 330/ GEOG 282	EAS 225	GEOG 506	EAS 521
GEOG 210	EAS 230	GEOG 513	EAS 530
GEOG 220	EAS 231	GEOG 514	EAS 531
GEOG 231	EAS 232	GEOG 515	EAS 532
GEOG 262	EAS 233	GEOG 516	EAS 533
GEOG 219	EAS 234	GEOG 522	EAS 534
GEOG 331	EAS 250	GEOG 544	EAS 535
METEO 230	EAS 270	GEOG 549	EAS 536
GEOG 333	EAS 271	GEOG 550	EAS 537
GEOG 352	EAS 320	GEOG 551	EAS 538
GEOG 360	EAS 321	GEOG 554	EAS 539
GEOG 346	EAS 322	GEOG 555	EAS 540
GEOG 223	EAS 324	GEOG 560	EAS 541
GEOG 327	EAS 325	GEOG 583	EAS 542
GEOG 420	EAS 326	GEOG 585	EAS 543
METEO 220	EAS 327	GEOG 586	EAS 544
GEOG 323	EAS 330	GEOG 587	EAS 545
GEOG 345	EAS 331	GEOG 530	EAS 550
GEOG 347	EAS 332	GEOG 531	EAS 551
GEOG 319	EAS 333	GEOG 532	EAS 552
GEOG 430	EAS 352	GEOG 535	EAS 553
GEOG 221/465	EAS 354	GEOG 537	EAS 554
METEO 330	EAS 370	GEOG 540	EAS 555
METEO 331	EAS 371	GEOG 533	EAS 570
GEOG 454	EAS 420	METEO 530	EAS 571
GEOG 463	EAS 421	METEO 425	EAS 572

**Notes**

- (1) Students are responsible for their own accommodation and meal expenses on all Earth and Atmospheric Sciences field trips.
- (2) A list of paleontology courses and course descriptions may be found under Paleontology.

**EAS 101 Introduction to Physical Earth Science**

★3 (fi 6) (either term, 3-0-3). Introduction to the origin of the earth and solar system, minerals and rocks, geological time, plate tectonics, and structural geology. Geomorphic environments and surface processes, groundwater, and mineral and energy resources. Not available to students with credit in GEOG 102, 201, 290, 292, or GEOG 130.

**EAS 102 Introduction to Environmental Earth Science**

★3 (fi 6) (either term, 3-0-3). The global energy budget and major energy pathways; the earth's patterns of weather systems and their impact on temperature, precipitation, moisture, and winds; circulation systems of the atmosphere and oceans; the global environmental system (evolution of the atmosphere, the oceans, the hydrosphere, the cryosphere, and the biosphere [including soils]); climate change and the evolution of the earth's climate patterns. Not available to students with credit in GEOG 131.

**EAS 103 Earth and Life Through Time**

★3 (fi 6) (second term, 3-0-3). Geologic and biological facts, processes, and concepts relevant to historical geology; minerals, rocks, plate tectonics, dating of rocks, formation of fossils, origin and evolution of life. Historical geology from the Big Bang to today, including formation of major deposits of economic value (diamonds, gold, nickel, oil and gas, salt, coal) and events of global significance, such as development of the ozone layer, global warming, asteroid impacts, extinction of dinosaurs and other life forms. Prerequisite: EAS 101. Not available to students with credit in GEOG 103 or 204 or EAS 203.

**EAS 110 Earth Science Field School**

★3 (fi 6) (second term, 10 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. Prerequisite: EAS 101 or 201 or 210. Not available to students with credit in GEOG 119.

**EAS 200 Introductory Studies in Earth Science**

★1 (fi 2) (either term, 0-0-3). Laboratory study of topographic and geological maps, minerals, and rocks. EAS 200 together with EAS 201 is considered to be equivalent to EAS 101 for prerequisite purposes. Not available to students with credit in EAS 101 or EAS 210. Corequisite: EAS 201.

**EAS 201 Earth Science I**

★3 (fi 6) (either term, 3-0-0). Origin of the earth and solar system, minerals and igneous, metamorphic and sedimentary rocks, geological time, plate tectonics, the formation of ocean basins and mountain building. Surface processes and landforms, groundwater, and mineral and energy resources. Prerequisite: Any 100-level Science course. Not available to students with credit in EAS 101, GEOG 201, 290, or 292.

**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.

**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 101, 102, 201 or 210. Not available to students with credit in GEOG 236.

**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. Not available to students with credit in EAS 102 and GEOG 207.

**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: One of EAS 101, 201 or 210. Not available to students with credit in GEOG 208.

**EAS 207 Mass Extinctions: Dinosaurs, Mammoths and Man?**

★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. Not available to students with credit in GEOG 209.

**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: EAS 102.

**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 101, 103, 201, 203 or 210. Not available to students with credit in GEOG 205.

**EAS 210 Engineering Earth Science**

★3 (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, 201, GEOL 102, 290, or 292. Intended for students in Engineering programs.

### **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.

### **0 EAS 220 Introduction to Computational Techniques in Earth and Atmospheric Sciences**

★3 (fi 6) (either term, 3-0-3). Introduction to computational methods and software for earth scientists and human geographers. Lectures emphasize the application of conventional descriptive and inferential analytical methods to spatial problems and their extensions to spatial analysis. Labs provide a hands-on introduction to the department's computational resources. Prerequisite: EAS 101 or 102. Not available to students with credit in GEOG 220.

### **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. Not available to students with credit in GEOG 328.

### **0 EAS 222 Stratigraphy and Sedimentation**

★3 (fi 6) (either term, 3-0-3). Sedimentary processes, environments and facies; properties and classification of sedimentary rocks; stratigraphic nomenclature and the stratigraphic column; principles of stratigraphic paleontology. Prerequisite: One of EAS 101, 103 or 210. Not available to students with credit in EAS 231 or GEOL 221.

### **0 EAS 223 Introduction to Hydrogeology**

★3 (fi 6) (either term, 3-0-3). An introduction to groundwater in the hydrologic cycle, the principles of groundwater flow, hydraulic properties of geologic materials, flow net analyses, regional groundwater flow, and well hydraulics. Groundwater as a geologic agent and groundwater resource evaluation. Prerequisites: One of EAS 101, 102, 201 or 210 and MATH 113 or 114, PHYS 100 or 108, and one of PHYS 101, 102 or 109. Not available to students with credit in GEOL 488.

### **0 EAS 224 Mineralogy I**

★3 (fi 6) (first term, 3-0-3). Principles of crystallography, physical and chemical properties of minerals, determinative mineralogy. Prerequisite: EAS 101 or 210. Not available to students with credit in GEOL 230.

### **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 101, 102, 201 or 210. Not available to students with credit in GEOG 330 or GEOL 282.

### **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. Not available to students with credit in GEOL 210.

### **0 EAS 231 Principles of Sedimentation**

★3 (fi 6) (either term, 3-0-3). Properties and classification of siliciclastic and carbonate rocks; weathering; transportation; recognition of facies, depositional processes; depositional models; contrasts between the siliciclastic and carbonate depositional regimes. Prerequisites: One of EAS 101, 103, or 210. Not available to students with credit in EAS 222 or GEOL 220.

### **0 EAS 232 Mineralogy II**

★3 (fi 6) (second 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. Not available to students with credit in GEOL 231.

### **0 EAS 233 Geologic Maps and Cross-Sections**

★3 (fi 6) (either term, 3-0-3). The construction and analysis of geologic maps and cross-sections, from surface and subsurface data. Introduction to procedures for collecting basic field information, aerial photograph interpretation, and the principles of geologic mapping. Prerequisite: One of EAS 101, 103, 201 or 210. Not available to students with credit in GEOL 262.

### **EAS 234 Geology Field School**

★3 (fi 6) (second term, 12 days). 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. Prerequisites: EAS 231 and 233. Not available to students with credit in GEOL 219.

### **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. Prerequisite: EAS 102 or BIOL 108. Not available to students with credit in GEOG 331.

### **0 EAS 270 The Atmosphere**

★3 (fi 6) (either term, 3-0-0). An introduction to weather and climate, with emphasis on conceptual rather than mathematical treatment. Atmospheric composition, temperature, humidity, wind, clouds; air masses, fronts, storms; weather forecasting. Regular weather map discussions, optional weather office visit. Prerequisite: Any 100-level Science course or consent of Instructor. Not available to students with credit in METEO 230.

### **0 EAS 271 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: Any 100-level Science course or consent of Instructor. Not available to students with credit in GEOG 333.

### **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 sedimentary chemistry in the exogenic cycle. Prerequisite: EAS 224. Not available to students with credit in GEOL 352.

### **0 EAS 321 Structural Geology**

★3 (fi 6) (either term, 3-0-3). Fundamentals of stress and strain in rocks; geometric, kinematic, dynamic analysis; nature, orientation, measurement, representation, and description of planar and linear penetrative and discrete structures, and of faults, joints and folds; stereographic and other projections and their applications; regional structure and the study of orogens. Prerequisite: EAS 233. Not available to students with credit in GEOL 360.

### **0 EAS 322 Petrology of Sedimentary Rocks**

★3 (fi 6) (either term, 3-0-3). Methods for examining sedimentary rocks; composition and classification of siliciclastic and carbonate rocks; recognition and classification of textures in sedimentary rocks; analysis of original constituents; analysis of cements; recognition and understanding of diagenetic fabrics. Prerequisite: EAS 232 and 222 or 231. Not available to students with credit in GEOL 346.

### **0 EAS 324 Analysis of Aerial Photographs and Satellite Imagery**

★3 (fi 6) (either term, 1-0-3). The interpretation and mapping of topography, surficial geology and geomorphology from aerial photographs and satellite images. Some field work may be required. Prerequisite: EAS 221 or 225. Not available to students with credit in GEOG 223.

### **0 EAS 325 Digital Mapping and Terrain Modelling**

★3 (fi 6) (either term, 3-0-3). Introduction to computerized mapping using gridded databases. The production and analysis of digital terrain models. Methods for the display of data derived from digital terrain models and for overlaying environmental information on them. Introduction to graphic output devices and to techniques of photographic and cartographic reproduction. Prerequisite: EAS 221. Not available to students with credit in GEOG 327.

### **0 EAS 326 Multivariate Statistical Methods for the Earth and Atmospheric Sciences**

★3 (fi 6) (either term, 3-0-0). The application of multivariate statistical methods to geoprocessing. Prerequisite: EAS 220. Not available to students with credit in GEOG 420.

### **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 102 and MATH 113. Not available to students with credit in METEO 220.

### **0 EAS 330 Stratigraphy**

★3 (fi 6) (either term, 3-0-3). Principles of stratigraphy and stratigraphic paleontology, historical geology of North America from the Cambrian to the Cenozoic with emphasis on Western Canada. Prerequisite: EAS 222 or 231. Not available to students with credit in GEOL 323.

### **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. Prerequisite: EAS 232. Not available to students with credit in GEOL 345.

**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. Prerequisite: EAS 232. Not available to students with credit in GEOL 347.

**EAS 333 Advanced Geology Field School**

★3 (fi 6) (second term, 12 days). 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 234, 321, 322, 331 and 332. Not available to students with credit in GEOL 319.

**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 to the environmental sciences. Examples from resource management and the earth and biological sciences. Labs impart technical experience with commercial and in-house software. Prerequisites: EAS 220 and 221. Not available to students with credit in GEOG 328.

**EAS 352 Hydrology and Fluvial Landforms**

★3 (fi 6) (either term, 3-0-0). The generation of surface runoff and sediment yields in drainage basins. Flow in channels. Landforms and sedimentary sequences resulting from river erosion, sediment transport and deposition. Evolution of river valleys through time. Applied aspects of fluvial geomorphology. Fieldwork required. Prerequisite: EAS 225. Not available to students with credit in GEOG 430.

**EAS 354 Environmental Earth Science Field School**

★3 (fi 6) (either term, 12 days). Introduction to fieldwork in geomorphology, biogeography and microclimatology. Elementary field mapping, the use of electronic field instrumentation for hydrological, water quality and microclimatology 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 prior to Fall classes. Prerequisites: EAS 223, 225, 250 and 270 or 271. Not available to students with credit in GEOG 221 or GEOG 465.

**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, MATH 215. Not available to students with credit in METEO 330.

**EAS 371 Atmospheric Fluid Dynamics**

★3 (fi 6) (either term, 3-0-0). An introduction to fluid dynamics on the rotating earth with reference to current weather; equations of motion and their simplification; vorticity; the atmospheric boundary layer; waves in the atmosphere; synoptic-scale weather; baroclinic instability; the general circulation. Prerequisites: EAS 270, MATH 214. Not available to students with credit in METEO 331.

**EAS 400 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. Note: Restricted to fourth year Honors and Specialization students and fifth year Industrial Internship students in the Geology program of Earth and Atmospheric Sciences.

**EAS 401 Industrial Internship Practicum**

★3 (fi 6) (first 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 will be determined on the basis of the employer evaluation of the student's job performance and the performance on written assignments and oral presentations during the course. Prerequisites: WKEXP 401 and 402.

**EAS 420 Geochemistry II**

★3 (fi 6) (either term, 3-0-3). Applications of geochemistry to rock- and ore-forming processes. Geochronology. Significance and use of minor elements and isotopes as tracers of major geological processes. Prerequisite: EAS 320. Not available to students with credit in GEOL 454.

**EAS 421 Advanced Structural Geology**

★3 (fi 6) (either term, 3-0-3). Brittle and ductile deformation; stress; mechanics of natural fractures; strain and kinematic models for the formation of ductile structures; strain rate and rheology; structural associations; and the anatomy of orogenic belts. Lab exercises introduce techniques of manual or computer-assisted stress and strain analysis, cross-section balancing, structural map interpretation, the recognition of shear-sense indicators in hand specimen and in thin section,

and their applications in subsurface mineral and hydrocarbon exploration. Prerequisite: EAS 321. Not available to students with credit in GEOL 463.

**EAS 422 Basin Analysis**

★3 (fi 6) (either term, 3-0-3). Classification and evolution of sedimentary basins; tectonics and sedimentation; clastic and carbonate depositional systems in a sequence stratigraphic framework. Prerequisite: EAS 322. Not available to students with credit in GEOL 442.

**EAS 424 Subsurface Geological Methods**

★3 (fi 6) (first term, 3-0-3). Methods of acquiring geologic data from beneath the surface by remote means; drilling, sampling, coring, logging; significance of geophysical techniques; presentation of subsurface information. Prerequisite: EAS 222 or 231. Not available to students with credit in GEOL 421.

**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 223.

**EAS 426 Honors Thesis**

★3 (fi 6) (either term, 3-0-0). Required for Honors students in their final year. Restricted to honors students in EAS. Prerequisite: Any 300-level EAS course.

**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.

**EAS 428 Directed Study II**

★3 (fi 6) (either term, 3-0-0). Prerequisite: EAS 427.

**EAS 430 Petroleum Geology**

★3 (fi 6) (either term, 3-0-3). Origin, maturation, and degradation of petroleum; conventional and unconventional source rocks; principles of migration; reservoir rocks; traps. Exploration and development of hydrocarbon plays using seismic, core and wire line logging, thin section petrography, correlation, mapping, and geochemistry. Prerequisite: EAS 320 and 322. Not available to students with credit in GEOL 424.

**EAS 431 Regional and Petroleum Hydrogeology**

★3 (fi 6) (either term, 3-0-3). Principles of hydrogeology, subsurface hydrodynamics and basinal fluid flow; evaluation and interpretation of subsurface hydrodynamic data of extended regions; hydraulics and hydrodynamics of petroleum entrapment; review of migration and accumulation theories; hydrogeologic indicators of petroleum accumulations; field examples. Co-/prerequisite: EAS 430 or consent of Instructor. Not available to students with credit in GEOL 427.

**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. Not available to students with credit in GEOL 428.

**EAS 433 Metalliferous Mineral Deposits**

★3 (fi 6) (first term, 3-0-3). Geological characteristics of metallic ore deposits. Genetic relations to igneous, metamorphic and sedimentary processes, tectonics, and structure. Basic mineral economics and exploration strategies are also incorporated. Prerequisite: EAS 331. Not available to students with credit in GEOL 432.

**EAS 434 Geochemistry of Ore Deposits**

★3 (fi 6) (second term, 3-0-0). Geochemical processes involved in ore formation. Applications of thermodynamics, hydrothermal experiments, fluid inclusions, and stable and radiogenic isotopes, and modern geothermal analogs to the understanding of ore formation. Prerequisite: EAS 433. Not available to students with credit in GEOL 433.

**EAS 435 Geotectonics**

★3 (fi 6) (either term, 3-0-0). Fundamentals of plate tectonic theory and the evolution of the Earth. Application of plate tectonics to the theory of sedimentary basins and orogenic belts. Tectonics of western North America. Prerequisite: EAS 321. Not available to students with credit in GEOL 470.

**EAS 436 Petrogenesis of Igneous and Metamorphic Rocks**

★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. Prerequisite: EAS 331 and 332. Not available to students with credit in GEOL 443.

**EAS 437 Geology of Canada**

★3 (fi 6) (second term, 3-0-0). An overview of the bedrock geology of Canada; how it all fits together. Description and interpretation of the geologic divisions of the Canadian land mass, from the Canadian Shield, through the Appalachian, Cordilleran, and Inuitian orogens, to Phanerozoic basins and platforms. Using the entire database of Canadian geology, this course aims to provide the knowledge and tools to "read the rocks" anywhere in Canada by linking principal

events and structures in the rock record to their significance in Canada's evolution over 4 billion years. Similarities and contrasts with the regional geology of other areas of Earth will be outlined. Prerequisite: EAS 321, 322, 330, 331 and 332.

#### **01 EAS 451 Digital Remote Sensing**

★3 (fi 6) (either term, 3-0-3). Digital image processing of multispectral remotely sensed information with emphasis on image enhancement and image classification. Applications include land use mapping, urban change detection, resource exploration, and environmental monitoring. Prerequisite: EAS 220, 221 and one of EAS 324 or 325 or LDRES 410. Not available to students with credit in GEOG 427.

#### **01 EAS 453 Arctic Environments**

★3 (fi 6) (either term, 3-0-0). The course is designed to provide a better understanding of high latitude environments from an interdisciplinary perspective. Topics include: Quaternary glaciations, periglacial geo-morphology, regional climatology, the Arctic Ocean basin; sea ice dynamics, and northern ecosystems. These themes are also related to global climatic change and environmental issues. Prerequisite: EAS 225 or 250. Not available to students with credit in GEOG 445. Offered in alternate years with EAS 455.

#### **01 EAS 454 Arid and Semiarid Environments**

★3 (fi 6) (either term, 3-0-0). Study of the geomorphological processes and landforms in the dry zones of the low and the mid-latitudes including the effects of environmental change. Prerequisite: EAS 225 or 250. Not available to students with credit in GEOG 437.

#### **01 EAS 455 Alpine Environments**

★3 (fi 6) (either term, 3-0-3). A holistic approach to environments and environmental change in the world's high mountain areas, emphasizing interactions between climate, vegetation, surface processes and geology. Issues addressed include mountain building and its role in Cenozoic climate change; mountain climates and geoecology; snow and its role in alpine hydrology, surface water acidification and avalanche activity; rock slope stability, mass movements and associated hazards; glaciers and their impact on alpine hydrology and geomorphology; problems of resource utilization in high mountains. A field trip may be required. Prerequisite: EAS 225 or 250. Not available to students with credit in GEOG 438. Offered in alternate years with EAS 453.

#### **01 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, 223, 225 or 250.

#### **01 EAS 470 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. Prerequisite: EAS 371. Not available to students with credit in METEO 430.

#### **01 EAS 471 Atmospheric Modelling**

★3 (fi 6) (either term, 3-0-3). Numerical Weather Prediction: dynamics; physics (e.g. influence of unresolved motion); operational models. Atmospheric modelling on other scales. Computing assignments: Advection-diffusion problems; simple dynamical models of the atmosphere. Prerequisites: EAS 371, MATH 215. Not available to students with credit in METEO 434.

#### **01 EAS 472 Earth and Climate System Modelling**

★3 (fi 6) (either term, 3-0-3). An introduction to numerical analysis and prediction of climate. Radiative transfer and simple climate models, global climate models, coupled ocean-atmosphere-cryosphere models, land surface processes and biological influences, geo-cycling of climatically-active chemicals. Computing assignments: simple climate models, calculation of atmospheric radiative transfer. Prerequisites: EAS 371, MATH 215.

## Graduate Courses

### 201.56.3 Faculty of Arts Courses

#### **EAS 590 Human Geography Seminar**

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

### 201.56.4 Faculty of Science Courses

#### **Notes**

- (1) See also INT D 594 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.
- (2) The following undergraduate course may be taken for credit by graduate students: PALEO 318, 319.

#### **EAS 520 Reading and Seminar Course**

★3 (fi 6) (either term, 0-3s-0). Not available to students with credit in GEOG 502 or GEOG 503.

#### **EAS 521 Earth and Atmospheric Science Research**

★3 (fi 6) (either term, 0-0-8). Not available to students with credit in GEOL 506.

#### **01 EAS 530 Principles of Ichnology**

★3 (fi 6) (first term, 3-0-0). Introduction to animal-sediment relationships in both modern and ancient environments; principles of classification and taxonomy, environmental significance of trace fossils in facies analysis. Prerequisites EAS 230 and 422. Not available to students with credit in GEOL 513.

#### **01 EAS 531 Process Sedimentology**

★3 (fi 6) (second term, 3-0-0). Concepts and applications of process sedimentology with emphasis on shallow marine processes of sedimentation and facies relationships for modern and ancient continental margin depositional systems. Prerequisite: EAS 422 or equivalent or consent of Instructor. Not available to students with credit in GEOL 514.

#### **01 EAS 532 Advanced Carbonate Sedimentology**

★3 (fi 6) (either term, 3-0-0). Course will cover aspects of carbonate mineralogy, formation of carbonates, role of biological activity, classification of carbonates, depositional environments of carbonates, diagenesis (including dolomitization) and reefs. Practical part of course consists of a 10-day field trip in an area of modern carbonate deposition. Not available to students with credit in GEOL 515.

#### **01 EAS 533 Advanced Petroleum Geology**

★3 (fi 6) (first term, 1-2s-1). Selected topics of petroleum geology, such as origin of oil, gas, bitumen; thermal maturation and microbial alterations; migration and trapping; reservoir diagenesis; basin analysis. Prerequisite: EAS 430 or consent of Instructor. Not available to students with credit in GEOL 516.

#### **01 EAS 535 Selected Topics in Petrology**

★3 (fi 6) (either term, 0-3s-0). Not available to students with credit in GEOL 544.

#### **01 EAS 536 Mineralogy - Petrology - Geochemistry Seminar**

★3 (fi 6) (either term, 0-3s-0). Selected topics in mineralogy, petrology and geochemistry presented and discussed by students and staff.

#### **01 EAS 537 Low Temperature Geochemistry**

★3 (fi 6) (first term, 3-0-0). Theories of transport in geological systems with a description of the major physical, chemical and biological processes. Equilibrium and non-equilibrium fluid-rock interactions with emphasis on solubility relationships, carbonate equilibria, ion complexes, and clay-dominated systems. Characterization of low temperature environments. Eh-pH diagrams, and sampling and analyses of fluids. Prerequisite: EAS 320 or equivalent. Not available to students with credit in GEOL 550.

#### **01 EAS 538 High Temperature Geochemistry**

★3 (fi 6) (either term, 3-0-0). Geometrical, thermodynamical and kinetical treatment of solid-liquid-gas equilibria and their application to metamorphic and igneous processes. Properties of silicate melts, crystallization, element partitioning, solutions. Geothermometry and geobarometry. Isotopes as tracers in petrogenesis. Prerequisites: EAS 320 and 436 or equivalent. Not available to students with credit in GEOL 551.

#### **01 EAS 539 Isotope Geology: Radioactive Systems**

★3 (fi 6) (first term, 3-0-0). Theory and systematics of radioactive decay, geochronology using K-Ar, Rb-Sr, U-Pb, Pb-Pb, Fission track; carbon-14, U-series disequilibrium and Sm-Nd systems; applications of natural radioactive isotope variation to geologic problems such as basalt genesis, formation of the crust, calibration of the Phanerozoic time scale and the nature of meteorites. Prerequisite: EAS 320 or equivalent. Not available to students with credit in GEOL 554.

#### **01 EAS 540 Isotope Geology: Stable Isotope**

★3 (fi 6) (second term, 3-0-0). Theory of light isotope fractionation, D and <sup>18</sup>O fractionation in the hydrologic cycle; carbonate paleothermometry; δD and δ<sup>18</sup>O variations in igneous, metamorphic and sedimentary rocks; δ<sup>34</sup>S, δD and δ<sup>18</sup>O variations in ore deposits; Biogeochemistry. Prerequisite: EAS 320 or equivalent. Not available to students with credit in GEOL 555.

#### **01 EAS 541 Selected Topics in Structural Geology and Tectonics**

★3 (fi 6) (second term, 3-0-0). Current topics in structural geology and tectonics, from mesoscopic strain and vorticity indicators to orogenic belts; terrane 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. Prerequisite: consent of Department.

#### **01 EAS 542 Selected Topics in Quaternary Geology**

★3 (fi 6) (second term, 0-3s-0). Prerequisite: INT D 594.

#### **01 EAS 543 Advanced Contaminant Hydrogeology**

★3 (fi 6) (either term, 3-0-0). Selected topics in contaminant hydrogeology. Possible topics include flow and transport in fractured and dual-porosity media; multi-phase flow of non-aqueous phase liquids in the shallow subsurface; characterization of dispersion processes at various scales; density-induced flow; coupled, non-linear groundwater transport processes; evaluation of groundwater remediation options. Prerequisite: EAS 425 or equivalent. Not available to students with credit in GEOL 585.

**EAS 544 Quantitative Hydrogeology**

★3 (fi 6) (second term, 3-0-3). Detailed examination of the theory and application of computer simulation techniques. Finite difference and finite element techniques as applied to groundwater flow and transport. Familiarization with computer codes and problem solving. Prerequisites: EAS 223 and an introductory computer programming course, or consent of Instructor. Not available to students with credit in GEOL 586.

**EAS 545 The Geologic Agency of Groundwater Flow**

★3 (fi 6) (second term, 1-3s-0). A comprehensive review of the diverse geologic and environmental effects and manifestations of regional groundwater flow including genesis of ore deposits, petroleum migration, soil salination, wet land hydrology, slope stability, contaminant transport, and so on. Topics of special interest to individual participants will be researched individually and discussed collectively in the form of seminars. Prerequisite: EAS 223 or consent of Instructor. Not available to students with credit in GEOL 587.

**EAS 550 Advanced Fluvial Geomorphology**

★3 (fi 6) (either term, 3-0-0). The study of alluvial terrace development and alluvial stratigraphies in a variety of river and stream environments. Strong emphasis is placed on local fieldwork. Prerequisite: A 300-level EAS course. It is recommended that students audit EAS 352 if it, or equivalent, has not been taken. Not available to students with credit in GEOG 530.

**EAS 551 Advanced Glacial Geomorphology**

★3 (fi 6) (first term, 3-0-0). Selected aspects of alpine-glacier and ice-sheet landform developments. Strong emphasis is placed on fieldwork. Prerequisite: A 300-level EAS course. Not available to students with credit in GEOG 531.

**EAS 552 Periglacial Geomorphology**

★3 (fi 6) (either term, 3-0-0). A study of cold-climate landforms and their genesis. Contemporary theories and studies of periglacial phenomena will be critically evaluated. Prerequisite: A 300-level EAS course. Not available to students with credit in GEOG 532.

**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. Not available to students with credit in GEOG 535.

**EAS 554 Circumpolar Quaternary Environments**

★3 (fi 6) (either term, 3-0-0). Past activity of high latitude ice sheets with particular emphasis on the development of field research conducted on northern mainland Canada and the adjacent Arctic islands. Similar research in Greenland, Spitzbergen, Europe and Russia is also presented. The understanding of late Cenozoic environments is highly interdisciplinary and topics include: glacial and marine stratigraphy, glacio-isostasy, sea level fluctuations, biological refugia and theories of climatic change. The course is designed to provide a thorough understanding of environmental change in high latitudes and students from different disciplines are encouraged to participate. Prerequisite: EAS 225 or EAS 453. Not available to students with credit in GEOG 537.

**EAS 555 Advanced Topics in Geomorphology**

★3 (fi 6) (second term, 3-0-0). Prerequisite: A 300-level course in geomorphology. Not available to students with credit in GEOG 540.

**EAS 570 Advanced Climatology**

★3 (fi 6) (first 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. Prerequisite: EAS 472. Not available to students with credit in GEOG 533.

**EAS 571 Cloud and Precipitation Physics**

★3 (fi 6) (second term, 3-0-0). Research methods in atmospheric physics. Analysis of measurements of cloud microphysical data sampled by research aircraft. Dynamics of cumulus clouds and severe storms. Formation of precipitation. Numerical cloud modelling. Analysis of radar data. Not available to students with credit in METEO 530.

**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. Not available to students with credit in METEO 425.

**201.57 Economics, ECON**

Department of Economics  
Faculty of Arts

**Note:** 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.

**Undergraduate Courses****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.

**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.

**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. Formerly ECON 304.

**ECON 205 Introduction to Economic Ideas**

★3 (fi 6) (either term, 3-0-0). An introduction to the principles of economics which stresses the development of these ideas through time and their relevance to society. Note: A student may not receive credit in more than two of ECON 101, 102 (or the former ECON 306, 307), and 205, nor may ECON 205 be used to replace ECON 101 or 102 as a prerequisite to senior courses. Formerly ECON 305.

**ECON 210 Japanese Economic Development**

★3 (fi 6) (either term, 3-0-0). An analytical survey of economic factors leading to Japan's present position in world trade. Prerequisite: ECON 101 or equivalent. Formerly ECON 310.

**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. Formerly ECON 311.

**ECON 212 European Economic Development**

★3 (fi 6) (either term, 3-0-0). A survey of economic changes in Western Europe from the Industrial Revolution to the present. Note: Not to be taken by students with credit in HIST 337. Prerequisite: ECON 101 or equivalent. Formerly ECON 312.

**ECON 213 An Introduction to the Economics of Developing Countries**

★3 (fi 6) (first 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 or equivalent. Formerly ECON 313.

**ECON 218 The Canadian Economy to 1945**

★3 (fi 6) (first term, 3-0-0). Analysis of Canadian economic development to 1945 with particular emphasis on Confederation, the National Policy and western settlement, industrialization, and the Depression. Prerequisite: ECON 101 or equivalent. Formerly ECON 318.

**ECON 219 The Canadian Economy since 1945**

★3 (fi 6) (second term, 3-0-0). Analysis of Canadian economic development since 1945, with particular emphasis on recurrent policy issues such as macroeconomic performance, trade liberalization, industrial policies, intergovernmental fiscal arrangements, and regional development. Prerequisite: ECON 101 or equivalent. Formerly ECON 319.

**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. Formerly ECON 381. Not open to students with credit in MANEC 301 or ECON 383.

**ECON 282 Intermediate Macroeconomic Theory I**

★3 (fi 6) (either term, 3-0-0). An introduction to analytical macroeconomic modelling. Flexible and fixed wage models of price, interest rate, output, and employment determination with emphasis on the relationship between the labor market and aggregate supply; 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 101/102 or consent of Department. Note: Not open to students with credit in MANEC 333 or 402. Formerly ECON 382.

**ECON 291 Economic Institutions and Ideologies**

★3 (fi 6) (either term, 3-0-0). Pre-capitalist Europe; the rise of individualism and the individualistic ethic; industrial capitalism; economics of Marx and Socialism; the rise of corporate capitalism; the consolidation of monopoly power; economic imperialism; Keynesian economics and economic policies; contemporary capitalism and its critics. Prerequisite: ECON 101 or equivalent. Formerly ECON 391.

**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 or 255 or equivalent, and MATH 113. 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 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. The topics are foreign trade, foreign investment, and the balance of payments. Note: Not open to students with credit in ECON 421 or 422. Prerequisite: ECON 101 or 102 or equivalent.

#### **ECON 331 Labor Economics**

★3 (fi 6) (first term, 3-0-0). Theory and empirical evidence concerning the supply of and demand for labor services, wage differentials, and the impact of unions. Some of the policy issues to be discussed are income maintenance, unemployment insurance, and minimum wage legislation. Prerequisite: ECON 101 or equivalent.

#### **ECON 332 Labor Market Policy**

★3 (fi 6) (second term, 3-0-0). Analytical and policy issues relating to human resource development and manpower utilization with particular reference to Canadian contemporary issues. Prerequisite: ECON 331 or consent of Department.

#### **ECON 341 Money and Banking**

★3 (fi 6) (either term, 3-0-0). Analysis of money and credit in the exchange process. Financial intermediation, commercial banking, central banking, and regulation of the banking and financial sectors. The money supply process and elementary issues of monetary control. Prerequisites: ECON 101 and 102 or equivalent.

#### **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 101 or equivalent. Not open to students with credit in ECON 351.

#### **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.

#### **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 equivalent.

#### **ECON 363 Introduction to Regional Economics**

★3 (fi 6) (either term, 3-0-0). An appraisal of the historical and current pattern of regional income disparities in Canada, with analysis emphasizing the causes of regional variations in employment and economic growth levels. An assessment of present federal and provincial policies designed to alleviate regional disparities will be made, combined with new policy programs that may be relevant. Prerequisite: ECON 101 or equivalent.

#### **ECON 365 Resource Economics**

★3 (fi 6) (either term, 3-0-0). Problems of allocation and development of natural resources, including contemporary Canadian resource policy issues; nature and types of resources; the economics of conservation and resource scarcity; and the role of resources in growth. Not open to students with credit in INT D 365. Prerequisite: ECON 101 or equivalent.

#### **ECON 366 Energy Economics**

★3 (fi 6) (either term, 3-0-0). Types of energy resources, substitutability, conversion. The relevance of energy to economic growth. Energy as input and as a consumers' good. An overview of quantities available and used. The problems of measuring energy, the energy balance, the energy industries. The role of energy in Canadian economic development. World energy markets. Energy policy problems. Prerequisite: ECON 101 or equivalent.

#### **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. Prerequisite: ECON 101 or equivalent.

#### **ECON 378 Law and Economics**

★3 (fi 6) (either term, 3-0-0). Analysis of the economic implications of property, contract, tort, criminal, and corporate law; examination of economic logic underlying different areas of law, and illustrations of the law as an economic institution; analysis of externality, risk, deterrence, and other leading issues in economics and law. Prerequisite: ECON 101 or equivalent.

#### **ECON 383 Microeconomics for Canadian Business Management**

★3 (fi 6) (either term, 3-0-0). Theories of choice as applied to consumer behavior and business decisions; production and price determination in alternative market forms; interrelatedness of firm decisions and of market outcomes; the impact of uncertainty. Prerequisites: ECON 101/102, MATH 113 or equivalent. Note: For students enrolled in the Faculty of Business only. Students cannot receive credit

in both ECON 281 and ECON 383. ECON 383 may be used as a prerequisite to 400-level economics courses instead of ECON 281.

#### **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 with emphasis on general equilibrium analysis. The following topics are examined: intertemporal choice, risk, uncertainty and expected utility; oligopoly and game theory; Walrasian models and models with entry; welfare, externalities, public goods and social choice; adverse selection, moral hazard and asymmetric information. Prerequisites: ECON 281 and MATH 113 or equivalent.

#### **ECON 385 Intermediate Macroeconomic Theory II**

★3 (fi 6) (either term, 3-0-0). Designed for majors and Honors students in Economics. The impact of expectations on price, output, and employment determination; theories of stabilization policy; the government budget constraint; inflation and unemployment; business cycles and growth; theories of aggregate consumption, investment, money demand, and money supply. Prerequisites: ECON 281 and 282.

#### **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 281/282; MATH 113/120 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 281/282 and STAT 255 or STAT 141/ ECON 299 or equivalent. Note: Not open to students with credit in AG EC 416 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) (second 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 401 History of Economic Thought I**

★3 (fi 6) (either term, 3-0-0). A survey of economic opinion and theories from Mercantilism to the Marginal Revolution. Emphasis on both theoretical and socioeconomic structures at various epochs of economic thinking. Prerequisite: ECON 281.

#### **ECON 402 History of Economic Thought II**

★3 (fi 6) (either term, 3-0-0). A survey of the economic opinions and theories from the rise of Neoclassical Economics to contemporary Macroeconomics. Emphasis will be on both theoretical and socioeconomic structures at various epochs of economic thinking. Prerequisite: ECON 281/282.

#### **ECON 407 Econometric Methods I**

★3 (fi 6) (first term, 3-0-0). Statistical inference in economics. Topics in statistical theory with emphasis on estimation and tests of hypotheses. The general linear regression model. Prerequisites: ECON 299 or STAT 255 or equivalent, and ECON 386/387 or consent of Department. Corequisite: ECON 481/482 or consent of Department.

#### **ECON 408 Econometric Methods II**

★3 (fi 6) (second term, 3-0-0). Econometric problems and techniques with emphasis on regression methods. Single equation techniques and introduction to simultaneous equation systems. Prerequisite: ECON 407 or equivalent.

#### **ECON 410 Pacific Rim Economic Development**

★3 (fi 6) (either term, 3-0-0). This course uses economic theory to analyze the role of particular markets and institutions in selected Pacific Rim economies. Special emphasis will be 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 384 or consent of Department.

#### **ECON 412 European Economic Development**

★3 (fi 6) (either term, 3-0-0). The application of economic theory and research methodology to selected topics in European economic development. Prerequisite: ECON 281.

#### **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 Canadian Economic Development**

★3 (fi 6) (either term, 3-0-0). Introduction to 'new economic history,' emphasizing the methodology of quantitative economic history research. Prerequisite: ECON 281 or consent of Department.

**ECON 421 International Trade**

★3 (fi 6) (first 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 consent of Department.

**ECON 422 International Payments**

★3 (fi 6) (second 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 consent of Department.

**ECON 431 Labor Economics**

★3 (fi 6) (either term, 3-0-0). An advanced treatment of demand for labor, supply of labor, wage differentials, trade union behavior, and related topics. Prerequisites: ECON 331 and ECON 281 and MATH 113 or consent of Department.

**ECON 441 Monetary Theory and Policy**

★3 (fi 6) (either term, 3-0-0). The theory of the demand for money; money, inflation and economic activity; monetary policy. Prerequisites: MATH 113 and ECON 385 or consent of Department.

**ECON 442 The Economics of Financial Markets**

★3 (fi 6) (either term, 3-0-0). The meaning and measurement of risk; portfolio analysis (individual choice and market equilibrium); interest rates and the term structure; inter-temporal and macro-policy issues; debt management. Prerequisites: ECON 282, 384, and STAT 141 or equivalent, or consent of Department.

**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 384 or consent of Department. Not open to students with credit in ECON 352.

**ECON 455 Welfare Economics and Public Sector Policies**

★3 (fi 6) (either term, 3-0-0). Theoretical welfare economics applied to the analysis of public policies, including such topics as the measurement of economic inequality, cost-benefit analysis, and public sector pricing. Prerequisite: ECON 384 or consent of Department.

**ECON 461 Transportation Economics**

★3 (fi 6) (either term, 3-0-0). Economic analysis of alternative transportation systems (water, air, road, and rail, for both freight and passengers). Role of transportation in urban, regional, and national economic development. Public policy toward transportation. Prerequisite: ECON 384 or consent of Department.

**ECON 462 Urban Economics**

★3 (fi 6) (either term, 3-0-0). An examination and analysis of the economic aspects of urban spatial organization (e.g. residential land use, firm location strategy), housing, transportation, and urban public finance. Prerequisites: ECON 281 and MATH 113 or consent of Department.

**ECON 466 The Economics of Non-Renewable Natural Resources**

★3 (fi 6) (either term, 3-0-0). The economic theory of non-renewable natural resources, resource allocation and resource policies with a focus on petroleum and natural gas supply and demand. Prerequisites: ECON 365 or 366 or 384 and MATH 113 or consent of Department. Note: ECON 365 and/or 366 are recommended as additional prerequisites.

**ECON 471 Industrial Organization Theory and Evidence**

★3 (fi 6) (first term, 3-0-0). Theories of the firm. Determinants and measures of market structure. Oligopoly theory, cartel formation, horizontal product differentiation and advertising. Entry and strategic entry deterrence. Innovation and Research and Development. Prerequisites: ECON 281 and MATH 113 or consent of Department.

**ECON 472 Industrial Behavior and Regulation**

★3 (fi 6) (second term, 3-0-0). An economic analysis of firm behavior under alternative market structures and its implications for competitive policy, including: price discrimination, tie-in sales, horizontal pricing arrangements, mergers, predation, and vertical market restrictions. Economic analysis of public utility regulation and regulation of industries with competitive market structures. Prerequisites: ECON 281 and MATH 113 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). Advanced treatment of preference, utility, and consumer demand; of production, cost, and supply; of market structure and market equilibrium. Introduction to general equilibrium analysis and welfare economics. Prerequisites: ECON 384 and 386 or consent of Department.

**ECON 482 Advanced Macroeconomic Theory**

★3 (fi 6) (either term, 3-0-0). An advanced treatment of aggregate economic behavior. Topics include basic macroeconomic analysis using calculus, 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). A basic set of game theory techniques is developed, with examples of how these apply to various fields, and to some questions in other disciplines. Prerequisites: ECON 384 and 386 or consent of Department.

**ECON 485 Macroeconomic Policy**

★3 (fi 6) (either term, 3-0-0). Identification and evaluation of the objectives and instruments of macroeconomic policy, drawing upon contemporary macroeconomic theory as a basis for policy evaluation, and using examples from the policy experiences of Canada and other nations. Prerequisites: MATH 113 and ECON 385 or consent of Department.

**ECON 498 Directed Readings I**

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

**ECON 499 Directed Readings II**

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

**Graduate Courses**

**Note:** See also INT D 566 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.

**ECON 500 Applications of Economic Theory and Analysis**

★3 (fi 6) (either term, 0-3s-0). The application of economic theory and analysis to selected issues, institutions, and applied problems through the use of case studies and research exercises.

**ECON 501 History of Economic Thought**

★3 (fi 6) (either term, 3-0-0). A survey of economic thought from Adam Smith to modern times, with particular attention to the theories of economic development and growth.

**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 386/387, 481/482.

**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 506 Applied Econometrics**

★4 (fi 6) (two term, 2-0-1). The role of economic theory in the specification and estimation of models. Interpretation and critical evaluation of applied work by means of selected topics in econometric theory.

**ECON 507 Econometrics I**

★3 (fi 6) (first term, 3-0-0). Topics in statistical theory; distribution theory including transformation of random variables, the multivariate normal and associated quadratic forms, maximum likelihood estimation and associated asymptotic tests. Estimation and inference in the general linear model. Prerequisite: ECON 407/408 or equivalent.

**ECON 508 Econometrics II**

★3 (fi 6) (second term, 3-0-0). Single equation methods and problems. Estimation and inference in the simultaneous equations model. Prerequisite: ECON 507 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 Economic Development of North America**

★3 (fi 6) (either term, 3-0-0). A selective analysis of historical factors involved in the economic growth and development of North America. Particular attention is given to Canadian experience, and to the use of economic theory and statistical techniques in historical research.

**ECON 516 European Economic Development**

★3 (fi 6) (either term, 3-0-0). The application of economic theory and research methodology to selected topics in European economic development.

**ECON 521 International Economics I**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ECON 481/482, ECON 421/422 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 481/482.

**ECON 541 Monetary Economics II**

★3 (fi 6) (either term, 3-0-0). Activities of financial intermediaries; evaluation of the effectiveness and the impact of monetary policy in both closed and open systems.

**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 552 Urban Economics**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ECON 481/482.

**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 558 Finance in the Public Sector**

★3 (fi 6) (either term, 3-0-0). Note: Restricted to students in the MPM Program.

**ECON 561 Transportation Economics**

★3 (fi 6) (either term, 3-0-0). Economic analysis of alternative transportation systems.

**ECON 563 Regional Economics**

★3 (fi 6) (either term, 3-0-0). Methodology of regional analysis including structural studies, location theory, input-output application, aggregative models and impact studies; regional development policy issues within a context of senior government policy objectives.

**ECON 565 Resource Economics I: The Economics of Conservation and Resource Scarcity**

★3 (fi 6) (either term, 3-0-0). Economic analysis of quantitative aspects of natural resource use and development; the economics of conservation; the role of resources in growth; resource scarcity; quantitative tools (benefit-cost and input-output analysis) in resources management; selected Canadian resource management; selected Canadian resource issues.

**ECON 570 Industrial Economics I**

★3 (fi 6) (either term, 3-0-0). Contemporary industrial structure, conduct and performance (Canadian and foreign); related public policies.

**ECON 571 Industrial Economics II**

★3 (fi 6) (either term, 3-0-0). Government enterprise, public regulation of private enterprise, and specific public policies concerning particular market elements, such as advertising, delivered pricing and patents.

**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 481/482 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 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 econometric theory. Prerequisites: ECON 407/408 or equivalent, and ECON 481/482 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).

## 201.58 Economie, ECONE

Faculté Saint-Jean

### Cours de 1er cycle

**0 ECONE 101 Introduction à la micro-économie**

★3 (fi 6) (premier semestre, 3-0-0). Analyse économique, problèmes et politiques avec accent sur l'économie canadienne; le rôle des consommateurs et des compagnies dans les marchés à compétition et à monopole; le capital étranger dans l'économie canadienne; distribution des revenus, inégalité et pauvreté; utilisation du milieu; politiques économiques gouvernementales. Prerequisite: Mathématiques 30 ou l'accord du Vice-doyen aux affaires académiques. Anciennement ECONE 201.

**0 ECONE 102 Introduction à la macro-économie**

★3 (fi 6) (deuxième semestre, 3-0-0). Analyses, problèmes et politiques économiques avec accent sur l'économie canadienne; revenu national et théorie monétaire; problèmes du chômage et de l'inflation; politiques gouvernementales monétaires et fiscales: théorie du commerce international, problèmes et politiques gouvernementales. Prerequisite: Mathématiques 30 ou l'accord du Vice-doyen aux affaires académiques. Anciennement ECONE 202.

**0 ECONE 281 Théorie micro-économique intermédiaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Théorie du comportement des consommateurs; théorie de la production; coûts de production; équilibre en situation de concurrence parfaite, de concurrence monopolistique, de monopole pur et d'oligopole. Prerequisite: ECONE 101/102 ou l'accord du Vice-doyen aux affaires académiques. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour ECON 383, ou MANEC 301.

**0 ECONE 282 Théorie macro-économique intermédiaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Les thèmes majeurs de ce cours sont le revenu national (théorie et applications), la théorie de la consommation globale, la théorie de l'investissement, la théorie de l'emploi, la politique monétaire et fiscale. Prerequisite: ECONE 101/102 ou l'accord du Vice-doyen aux affaires académiques. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MANEC 333 ou MANEC 402. Anciennement ECONE 382.

**0 ECONE 318 Introduction au développement économique du Canada I**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Analyse du développement économique au Canada avant la première guerre mondiale. Ce cours met l'accent particulièrement sur la Confédération, la politique nationale et le peuplement de l'Ouest. Prerequisite: ECONE 101/102 ou l'accord du Vice-doyen aux affaires académiques. Remarque: un étudiant ne peut cumuler les crédits de ECONE 316 et ECONE 318.

**0 ECONE 319 Introduction au développement économique du Canada II**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Analyse du développement économique au Canada depuis la première guerre mondiale. Ce cours s'intéresse spécialement aux questions de politique qui réapparaissent périodiquement telles que la libération du commerce, l'investissement étranger, les disparités régionales et la performance macro-économique. Prerequisite: ECONE 318. Remarque: un étudiant ne peut cumuler les crédits de ECONE 317 et ECONE 319.

**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.

#### ECONE 341 Monnaie et Banque

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Dans ce cours l'accent est mis principalement sur l'offre de monnaie et le contrôle monétaire. Y seront abordées des questions telles le rôle de la monnaie et du crédit dans le processus de l'échange, les intermédiaires financiers, les banques commerciales et les banques centrales. Prérequis: ECONE 101/102 ou l'accord du Vice-doyen aux affaires académiques.

#### ECONE 399 Introduction à l'économétrie

★3 (fi 6) (l'un ou l'autre semestre, 3-0-1). Etude élémentaire des sujets majeurs de l'économétrie avec insistance sur les méthodes de régression appliquée. Prérequis: ECONE 281/282, ECON 395/396, ou STAT 255 ou l'équivalent. Remarque: ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en AG EC 416, ECON 408, MGTSC 413, 414, 417, 419, ou STAT 341. Les étudiants s'inscrivant au Certificat d'équivalence après avoir terminé un BA (Général) peuvent remplacer ECON 395/396 par STATQ 141 ou STAT 236 avec l'accord du Vice-doyen aux affaires académiques.

#### ECONE 401 Histoire de la pensée économique I

★3 (fi 6) (premier semestre, 3-0-0). Survol de la pensée et des théories économiques depuis le mercantilisme jusqu'à la révolution marginaliste. L'accent sera mis sur les structures tant théoriques que socio-économiques à diverses époques de la pensée économique. Prérequis: ECONE 281.

#### ECONE 402 Histoire de la pensée économique II

★3 (fi 6) (deuxième semestre, 3-0-0). Survol de la pensée et des théories économiques depuis l'avènement des théories économiques néo-classiques jusqu'aux théories macro-économiques contemporaines. L'accent sera mis sur les structures tant théoriques que socio-économiques à diverses époques de la pensée économique. Prérequis: ECONE 281/282.

## 201.59 Education, EDUC

Faculté Saint-Jean

### Cours de 1er cycle

#### EDUC 200 Introduction générale à l'éducation

★3 (fi 7) (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 le monde dans lequel nous vivons, le rôle de l'école, les élèves et les objectifs éducatifs. L'autre partie du cours est une expérience pratique d'observation participante vécue dans le milieu scolaire. Corequis: EDUC 201. Ce cours n'est pas accessible aux étudiants ayant des crédits en ENPRQ 200 ou ENPRQ 251. Note: Des frais de placement seront exigés pour ce cours. Veuillez consulter \$22.2.1 pour de plus amples détails.

#### EDUC 201 Stratégies générales d'enseignement

★3 (fi 6) (l'un ou l'autre semestre, 3-0-2). Cours pratique de stratégies d'enseignement qui vise à outiller l'apprenant dans les domaines tels que la planification, le questionnement, la participation active, la vérification de la compréhension, les directives, les explications, et le travail de groupe. Ateliers de micro-enseignement. Corequis: EDUC 200

#### EDUC 300 La communication et la gestion en salle de classe

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude et acquisition des habiletés nécessaires à la bonne communication et l'application de cette étude aux différents modèles de gestion en salle de classe. Ce cours n'est pas accessible aux étudiants ayant des crédits en PS ED 465, EDUC 303 ou leurs équivalents.

#### EDUC 302 Evaluation des apprentissages en milieu scolaire

★1.5 (fi 3) (l'un ou l'autre semestre, 1.5-0-0). Etudes des notions fondamentales de la mesure et de l'évaluation des apprentissages en milieu scolaire. Exploration de l'acte d'évaluation et de sa place dans le processus d'enseignement et d'apprentissage. Examen des pratiques évaluatives. Analyse et conception d'instruments de mesure du rendement scolaire. Grilles d'observation.

#### EDUC 303 La gestion de classe

★1.5 (fi 3) (l'un ou l'autre semestre, 1.5-0-0). Ce cours a pour objectif d'étudier différents modèles de gestion et de voir leurs applications en salle de classe.

## 201.60 Education, EDU

Faculté of Education

### Undergraduate Courses

#### EDU 102 Special Topics in Elementary Education

★1-12 (variable) (variable, variable). This course is designed to address timely topics in Education. Note: Not available for credit for students registered in the BEd, BEd/BSc, or BPE/BEEd program.

#### EDU 103 Special Topics in Secondary Education

★1-12 (variable) (variable, variable). This course is designed to address timely topics in Education. Note: Not available for credit for students registered in the BEd, BEd/BSc, or BPE/BEEd program.

#### EDU 104 Special Topics in Educational Psychology

★1-12 (variable) (variable, variable). This course is designed to address timely topics in Education. Note: Not available for credit for students registered in the BEd, BEd/BSc, or BPE/BEEd program.

#### EDU 105 Special Topics in Educational Policy Studies

★1-12 (variable) (variable, variable). This course is designed to address timely topics in Education. Note: Not available for credit for students registered in the BEd, BEd/BSc, or BPE/BEEd program.

## 201.61 Education - Administration and Leadership, EDAL

Department of Educational Policy Studies  
Faculty of Education

Note: the course prefix for Education Administration has changed from EDADM to EDAL.

### Graduate Courses

#### EDAL 501 Evolving Concepts in Educational Administration and Leadership

★3 (fi 6) (either term, 3-0-0).

#### EDAL 502 Administrative and Leadership Processes in Education

★3 (fi 6) (either term, 3-0-0). Prerequisite: EDAL 501

#### EDAL 521 Supervision of Educational Personnel

★3 (fi 6) (either term, 3-0-0).

#### EDAL 522 Selected Topics in Educational Supervision

★3 (fi 6) (either term, 3-0-0).

#### EDAL 527 Orientations to Administrator-Student Relationships

★3 (fi 6) (either term, 3-0-0).

#### EDAL 528 Administration of Postsecondary Student Personnel Services

★3 (fi 6) (either term, 3-0-0).

#### EDAL 531 Administration of Schools

★3 (fi 6) (either term, 3-0-1).

#### EDAL 532 Administration of School Jurisdictions

★3 (fi 6) (either term, 3-0-0).

#### EDAL 533 Principalship Practicum I

★3 (fi 6) (first term, 3-0-1). This practicum course in the principalship specialization provides opportunities to examine issues of educational leadership in a variety of school settings. Students are engaged in exploring these issues through readings, seminars, and school-based activities. Students will develop skills in observation, shadowing, interviewing, group facilitation, and reflection through data gathering at specific school sites. Pre-/corequisites: EDAL 501 and 502.

#### EDAL 534 Principalship Practicum II

★3 (fi 6) (second term, 3-0-1). Normally, students take this course in the term following their enrolment in EDAL 533. This course is designed to continue the exploration, begun in EDAL 533, of issues in educational leadership. As in EDAL 533, students are engaged in exploring these issues through readings, seminars, and school-based activities. Corequisites or prerequisites: EDAL 501 and 502.

#### EDAL 535 Mentorship in the Principalship

★3-6 (variable) (variable, variable). This practicum course in the principalship specialization provides opportunities to examine personal leadership qualities and styles as well as issues in educational leadership. Students participate in school-based mentorship activities, seminars, scholarly reading, and reflective journaling.

#### EDAL 541 Planned Change in Educational Organizations

★3 (fi 6) (either term, 3-0-0).

#### EDAL 546 Educational Planning Processes

★3 (fi 6) (either term, 3-0-0).

#### EDAL 547 Administrative Applications of Computing

★3 (fi 6) (either term, 3-0-0).

#### EDAL 548 Management of Information Systems

★3 (fi 6) (either term, 3-0-0).

#### EDAL 551 Governance and Administration of Education in Canada

★3 (fi 6) (either term, 3-0-0).

**EDAL 553 Legal Aspects of Educational Administration**

★3 (fi 6) (either term, 3-0-0).

**EDAL 557 Administration of Education Across Cultures**

★3 (fi 6) (either term, 3-0-0).

**EDAL 565 Educational Finance**

★3 (fi 6) (either term, 3-0-0).

**EDAL 571 The Organization of Postsecondary Education**

★3 (fi 6) (either term, 3-0-0).

**EDAL 572 Administration of Postsecondary Institutions**

★3 (fi 6) (either term, 3-0-0). Prerequisite: EDAL 571 or consent of Department.

**EDAL 594 Seminar and Practicum in Administrative Behavior II**

★3 (fi 6) (either term, 3-0-1). Prerequisite: consent of Department.

**EDAL 595 The School Principalship: Seminars and Simulations**

★3 (fi 6) (either term, 3-0-1). Applied activities and academic studies which enable the student to learn skills and knowledge pertinent to the responsibilities of the principal, by disciplined reflection on their performance in simulated administrative situations. Prerequisites: EDAL 501 and 502 or consent of department.

**EDAL 605 Selected Topics in Educational Administration I**

★3 (fi 6) (either term, 3-0-0).

**EDAL 606 Problems in Educational Administration II**

★3 (fi 6) (either term, 3-0-0).

**EDAL 611 Research Methods I**

★3 (fi 6) (either term, 3-0-0).

**EDAL 612 Research Methods II**

★3 (fi 6) (either term, 3-0-0).

**EDAL 625 Administrative Behavior I**

★3 (fi 6) (either term, 3-0-0).

**EDAL 626 Administrative Behavior II**

★3 (fi 6) (either term, 3-0-0).

**EDAL 635 Organization Theory I**

★3 (fi 6) (either term, 3-0-0).

**EDAL 645 Policy Analysis in Education I**

★3 (fi 6) (either term, 3-0-0).

**EDAL 655 Politics of Education I**

★3 (fi 6) (either term, 3-0-0).

**EDAL 656 Politics of Education II**

★3 (fi 6) (either term, 3-0-0).

**EDAL 665 Economic Environment of Education I**

★3 (fi 6) (either term, 3-0-0).

**EDAL 671 Issues in Administration of Postsecondary Education I**

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

**EDAL 672 Issues in Administration of Postsecondary Education II**

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

## 201.62 Education - Adult, EDAE

Department of Educational Policy Studies  
Faculty of Education**Note:** the course prefix for Education (Adult) has changed from EDADU to EDAE.

### Undergraduate Courses

**EDAE 223 Adult Education Major**

★3 (fi 6) (either term, 3-0-0).

**EDAE 243 Adult Education Major**

★3 (fi 6) (either term, 3-0-0).

**EDAE 323 Adult Education Major**

★3 (fi 6) (either term, 3-0-0).

**EDAE 343 Adult Education Major**

★3 (fi 6) (either term, 3-0-0).

**EDAE 345 Introduction to Adult Education**

★3 (fi 6) (either term, 3-0-0). This course includes selected aspects of the nature and scope of adult education important to instructors of adults who specialize in various fields of adult education. Various aspects of the broad field of adult education are considered.

**EDAE 390 Introduction to Adult Curriculum and Instruction**

★3 (fi 6) (either term, 3-0-0). This course focuses on the following topics as they relate to adult education: mastery learning, program goals, and objectives, long

range curriculum planning, content analysis processes, and writing performance objectives.

**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 423 Adult Education Major**

★3 (fi 6) (either term, 3-0-0).

**EDAE 443 Adult Education Major**

★3 (fi 6) (either term, 3-0-0).

**EDAE 460 Planning for Adult Education**

★3 (fi 6) (either term, 3-0-0). This course includes selected aspects of planning important to instructors of adults who specialize in various fields of adult education. Various aspects of planning for adult instruction are considered. The course provides instructors of adults with advanced information about program goals and objectives, instructional objectives, unit planning, lesson planning, modular planning, planning and integrating higher level thinking skills, and planning for the use of instructional technology. Principles and techniques of planning are considered from the perspective of an instructor of adults. Prerequisite: EDAE 345.

**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.

**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.

**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.

### Graduate Courses

**EDAE 511 Instructional Design in Postsecondary Education**

★3 (fi 6) (either term, 3-0-0).

**EDAE 521 Psychology of Learning and Teaching at the Adult Level**

★3 (fi 6) (either term, 3-0-0).

**EDAE 523 Administration of Further Education**

★3 (fi 6) (either term, 3-0-0).

**EDAE 530 Literacy in Adult Education**

★3 (fi 6) (either term, 3-0-0). Coordinated by the Department of Elementary Education.

**EDAE 537 Issues in the Teaching of English as a Second or Other Language**

★3 (fi 6) (either term, 3-0-0). Prerequisite: EDPY 416.

**EDAE 540 Introduction to Human Resource Development**

★3 (fi 6) (either term, 3-0-0). This course focuses on concepts and strategies for the development of human resources within organizational contexts.

**EDAE 541 Topics in Adult Basic Education**

★3 (fi 6) (either term, 3-0-0). This course examines the policies and philosophies which characterize a variety of ABE programs. Characteristics of learners and approaches to curriculum are emphasized.

**EDAE 545 Adult Education in the Workplace**

★3 (fi 6) (either term, 3-0-0). Designed for trainers and developers, community-based adult educators, counsellors and planners, this course will focus on informal learning and critical analysis of issues in the workplace.

**EDAE 560 Instructional Methods in Adult and Higher Education**

★3 (fi 6) (either term, 3-0-0).

**EDAE 561 Curriculum Planning in Adult and Higher Education**

★3 (fi 6) (either term, 3-0-0).

**EDAE 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.

**EDAE 585 Needs Assessment and Program Evaluation**

★3 (fi 6) (either term, 3-0-0).

## 201.63 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: Typing 20 or the equivalent.

#### EDBU 355 Business Computer Processing

★3 (fi 6) (either term, 0-4L-0). Commercial applications, and the teaching of computer processing in the secondary school.

#### EDBU 357 Teaching of Accounting in Automated Data Processing and Accounting

★3 (fi 6) (either term, 3-0-0). Prerequisite: ACCTG 311.

## 201.64 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 220 Career Studies

★15 (fi 30) (variable, unassigned).

#### EDCT 221 Career Studies

★15 (fi 30) (variable, unassigned).

#### EDCT 222 Career Studies

★9 (fi 18) (variable, unassigned).

#### EDCT 400 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.

### 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.

## 201.65 Education - Elementary, EDEL

(Curriculum and Instruction)  
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: EDPS 310 and EDFX 325. Students may not receive credit for both EDEL 300 and 370.

#### 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. Prerequisite: Introductory Professional Term.

#### EDEL 305 Communication Through Language Arts

★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. Prerequisite: Introductory Professional Term.

#### 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. Prerequisite: Introductory Professional Term.

#### 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. Prerequisite: Introductory Professional Term.

#### EDEL 328 Music Literacy: The Child

★3 (fi 6) (either term, 3-0-0). An introduction to theory and practice of teaching music literacy in the elementary classroom. Special emphasis on strategies employed in the Kodály approach. Prerequisites: Music 151 and 156; or consent of Department. 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. Prerequisite: Introductory Professional Term. Students may not receive credit for both EDEL 330 and EDEL 372.

#### 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 355 Program Environments in Early Childhood Education

★3 (fi 6) (either term, 3-0-3). 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 390 Supervised Independent Study 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 405 Theoretical Perspectives of Language Learning

★3 (fi 6) (either term, 3-0-0). This course provides a theoretical basis for understanding how children acquire and process oral and written language. It also focuses on the implications of social context for language learning. Prerequisite: An introductory curriculum and instruction course in language learning; or consent of Department.

#### 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 410 Language Learning in the Elementary School**

★6 (*fi 12*) (either term, 6-0-2). Prerequisite: An introductory curriculum and instruction course in language learning; or consent of Department.

**EDEL 411 Drama in the Elementary School**

★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 413 Diagnostic Teaching of Speech and Oral Language**

★3 (*fi 6*) (either term, 3-0-0). This course considers normal development of speech and oral language in the elementary grades. Theories of normal development, usage and pragmatics of skills, and the impact on academics are considered. An overview of some common disorders encountered by the elementary teacher in the classroom are discussed with practical management techniques being highlighted. Prerequisite: An introductory curriculum and instruction course in language learning; or consent of Department.

**EDEL 415 Teaching Mathematics in the Elementary School**

★3 (*fi 6*) (either term, 3-0-0). A major focus in this course will be the use of calculators and computers in the elementary mathematics classroom. Students will have the opportunity to view and assess current software. 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. Pre- or corequisite: 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. Prerequisites: MUSIC 151 and 156. Pre-/corequisite: MUSIC 207. Note: Priority given to students in the Music Education Minor.

**EDEL 428 Music in the Elementary School II**

★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 may require scheduled visits to elementary classrooms. Prerequisite: MUSIC 101; 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; light and shadows; 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; flight; weather watch; rocks and minerals; and classroom chemistry. 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). Prerequisite: 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. [Coordinated by Department of Educational Policy Studies]

**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 456 Integrating Theory and Practice in Early Childhood Education**

★3 (*fi 6*) (either term, 3-0-3). 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 460 The Teacher's Role in Curriculum Development**

★3 (*fi 6*) (either term, 3-0-0).

**EDEL 461 Individualizing Curriculum in the Elementary School**

★3 (*fi 6*) (either term, 0-3L-0).

**EDEL 470 Reflective Practice in the Elementary School**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisites: EDEL 370 and completion of ★15 of introductory EDEL courses. Must be taken in conjunction with EDPY 420. Note: last offered in 1997/98. Restricted to students in Year 4 of the old program.

**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 Theories of Language Processing**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: Equivalent to ★3 in language arts education, or consent of Department.

**EDEL 506 Theories of Language Development: The Elementary School Child**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: Equivalent to ★3 in language arts education, or consent of Department.

**EDEL 507 Issues in Developmental Literacy**

★3 (*fi 6*) (either term, 3-0-0). 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). Prerequisite or corequisite: EDEL 505 or equivalent.

**EDEL 509 Diagnosis and Remediation of Reading and Writing Problems II**

★3 (*fi 6*) (either term, 3-0-3). Prerequisite EDEL 508.

**EDEL 510 Curriculum and Instruction in Children's Literature for Elementary Schools**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: Equivalent to ★3 in language arts education, or consent of Department.

**EDEL 511 Elementary Language Arts Programs: Development and Supervision**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: Equivalent to ★3 in language arts education, or consent of Department.

**EDEL 512 Oral Language: Content and Context of the Classroom**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★3 in language education or consent of Department.

**EDEL 513 Speech and Oral Language Disorders: Implications in the Elementary Classroom**

★3 (*fi 6*) (either term, 3-0-0).

**EDEL 517 Research in Mathematics Education I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: EDEL 415 or consent of Department.

**EDEL 530 Research in Elementary School Science**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: EDEL 430 or 431 or consent of Department.

**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 558 Curriculum and Instruction in Early Childhood Education**

★6 (fi 12) (two term, 3-0-3; 3-0-0). A basic course on programming in early childhood classrooms for teachers requiring a background in this field of study.

**EDEL 560 Foundations of Curriculum Development**

★3 (fi 6) (either term, 3-0-0). A study of educators' views of knowledge, society, and the learner and the effect of those views on curriculum development.

**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). Prerequisite: consent of Department.

**EDEL 568 Introduction to Qualitative Research Methods in Education**

★3 (fi 6) (either term, 3-0-0).

**EDEL 570 Instructional Practices in the Elementary Classroom**

★3 (fi 6) (either term, 3-0-0).

**EDEL 571 Models of Teaching**

★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 591 Directed Individual Study in Elementary Education**

★6 (fi 12) (two term, variable). Prerequisite: consent of Department.

**EDEL 595 Seminar in Elementary Education: Selected Topics**

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

**EDEL 596 Special Seminars in Elementary Education**

★1-12 (variable) (either term, variable). Prerequisite: consent of Department.

**EDEL 605 Theories and Models of Language**

★3 (fi 6) (either term, 3-0-0). Prerequisite: EDEL 500 or consent of Department.

**EDEL 607 Symposium in Language Learning Research**

★3 (fi 6) (either term, 3-0-0). Exploration of recent research in language learning at the local, national, and international levels. Prerequisite: EDEL 505 or 506, or consent of Department.

**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 696 Conference Course in Elementary Education**

★6 (fi 12) (two term, variable). Note: May be offered in a single term.

**EDEL 697 Symposium in Elementary Education**

★6 (fi 12) (two term, 0-3s-0). Research reports by staff and students. Compulsory for all doctoral students.

**EDEL 900 Directed Research Project**

★3 (fi 6) (variable, unassigned).

## 201.66 Education - Elementary and Secondary, EDES

(Common Curriculum and Instruction Courses)

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 146 Education Handbell Choir**

★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 handbell choir. Note: This is a credit/no credit course.

**EDES 147 Education Pep Band**

★0 (fi 1) (either term, 0-0-2). A music ensemble designed to provide education students with practical experience in the organization, administration and literature of the pep band. Note: This is a credit/no credit course that may be offered over the full session.

**EDES 148 Education Chamber Music Ensemble**

★0 (fi 1) (either term, 0-0-2). A music ensemble designed to provide education students with practical experience in the organization, administration and literature of a chamber ensemble. Note: This is a credit/no credit course that may be offered over the full session.

**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 401 Conference Seminar**

★1-12 (variable) (variable, variable).

**EDES 445 Canadian Literature for Young People in Schools and Libraries**

★3 (fi 6) (either term, 3-0-0). A survey of Canadian literature written for young people from preschool through junior high years. Emphasis on contemporary works, and consideration of current issues and trends in the field.

### Graduate Courses

**EDES 501 Conference Seminar**

★1-12 (variable) (variable, variable).

**EDES 540 School Librarianship**

★3 (fi 6) (first term, 3-0-0). Introduction to the philosophy and administration of school library programs in elementary and secondary schools.

**EDES 541 School Library Collection Development**

★3 (fi 6) (either term, 3-0-0).

**EDES 543 School Library Programs**

★3 (fi 6) (second term, 3-0-0). Focus on cooperative planning and implementation of school library programs.

**EDES 546 School Library Information Materials**

★3 (fi 6) (either term, 3-0-0).

**EDES 547 Organization of School Library Materials**

★3 (fi 6) (either term, 3-0-0).

**EDES 548 Directed Study in School Library Research**

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

**EDES 649 Curriculum Evaluation**

★3 (fi 6) (first term, 3-0-0). An interdepartmental seminar devoted to an examination of evaluation in the broad perspective of its place in education.

**EDES 690 Doctoral Seminar in Teacher Education**

★3 (fi 6) (either term, 0-3s-0).

## 201.67 Education - Field Experience, EDFX

Division of Field Experiences

Faculty of Education

**Notes**

- (1) Field Experience courses other than EDFX 475 and 476 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 §22.2.1 for details.
- (3) The course prefix for Education (Field Experience) courses has changed from EDFXP to EDFX.

### Undergraduate Courses

**EDFX 200 Introduction to the Profession of Teaching**

★3 (fi 7) (either term, 2-0-4). This course explores the complex roles of teachers as professionals in contemporary schools. Through a combination of field-based and classroom experiences students will become familiar with the scope and expectations of the role of the teacher and the framework within which teachers work. Students may not receive credit for both EDFX 200 and EDFXP 151.

**EDFX 325 Elementary Route Field Experience for the Introductory Professional Term**

★3 (fi 7) (either term, 4 weeks full-time in schools). Prerequisites: EDFX 200 and EDPY 200. Note: These prerequisites do not apply to After Degree students. Corequisites: EDPS 310 and EDEL 300.



**EDFX 350 Secondary Route Field Experience for the Introductory Professional Term**

★3 (*fi 7*) (either term, 4 weeks full-time in schools). Prerequisites: EDFX 200 and EDPY 200. Note: These prerequisites do not apply to After Degree students. Corequisites: EDPS 310 and Education Minor.

**EDFX 375 Field Experience in Adult Education**

★3 (*fi 6*) (either term, 5 weeks). An initial field experience in Adult Education.

**EDFX 420 Student Teaching in the Elementary School**

★12 (*fi 25*) (either term, 12 weeks). Prerequisite: Completion of ★18 of EDEL courses. Note: last offered 1997/98. Restricted to students in Year 4 of old program.

**EDFX 425 Elementary Route: Generalist Field Experience for the Advanced Professional Term**

★9 (*fi 19*) (either term, 9 weeks full-time in schools). Prerequisites: Introductory Professional Term and ★15 of EDEL courses.

**EDFX 426 Elementary Route: Special Education Field Experience for the Advanced Professional Term**

★9 (*fi 19*) (either term, 9 weeks full-time in school)s. Prerequisites: Introductory Professional Term ★15 of EDEL courses, and completion of all courses in the Special Education Minor.

**EDFX 430 Student Teaching in the Elementary School (Special Education)**

★6 (*fi 13*) (either term, 6 weeks). Special Education focus area only. Prerequisite: Completion of ★18 of EDEL courses. Corequisite: EDPSY 461. Note: Last offered in 1997/98. Restricted to students in Year 4 of the old program.

**EDFX 440 Student Teaching in Special Education Programs in the Elementary School**

★6 (*fi 12*) (either term, 6 weeks). Special Education focus area only. Prerequisites: EDFX 430, EDPY 461, and completion of ★18 of EDEL courses. Note: last offered in 1997/98. Restricted to students in Year 4 or the old program.

**EDFX 450 Secondary Route Field Experience for the Advanced Professional Term**

★6 (*fi 13*) (either term, 9 weeks full-time in schools). Prerequisites: Introductory Professional Term and ★24 in the Major. Corequisite: EDFX 451.

**EDFX 451 Integrating Theory and Classroom Practice in the Advanced Professional Term**

★3 (*fi 6*) (either term, 3-0-1). Prerequisites: Introductory Professional Term and ★24 in the Major subject area. Corequisites: EDFX 450 and EDSE (Major) courses. (Offered by the Department of Secondary Education.)

**EDFX 475 Field Experience at the Postsecondary Level I**

★3 (*fi 6*) (either term, 3 weeks full-time in schools).

**EDFX 476 Field Experience at the Postsecondary Level II**

★3 (*fi 7*) (either term, 3 weeks full-time in schools).

**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.

## 201.68 Education - Foundations, EDFN

Department of Educational Policy Studies  
Faculty of Education

**Note:** The course prefix for Education (Foundations) courses has changed from EDFDN to EDFN.

### Undergraduate Courses

**EDFN 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.

**EDFN 361 Sociology of Learning and Achievement**

★3 (*fi 6*) (either term, 3-0-0).

**EDFN 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.

**EDFN 461 School and Community**

★3 (*fi 6*) (either term, 3-0-0). The school in the context of community culture and structure.

### Graduate Courses

**EDFN 510 Education from an Anthropological Perspective**

★3 (*fi 6*) (either term, 3-0-0).

**EDFN 522 Functions of Education in the Development of Emerging Nations**

★3 (*fi 6*) (either term, 3-0-0). This course focuses on the development of and the current problems in education in developing countries.

**EDFN 523 Development Theory and Education**

★3 (*fi 6*) (either term, 3-0-0). The meaning of the concept Societal Development. Theories of development put forward by selected writers, and an analysis of the role of education in the development process, with particular attention to the Third World. Prerequisite: consent of Department.

**EDFN 524 Strategies of Educational Reform and National Development in Socialist and Non-Socialist Third World Society**

★3 (*fi 6*) (either term, 3-0-0). A critical examination of strategies of educational reform and development in selected socialist and non-socialist societies in the Third World. Prerequisite: EDFN 523 or consent of Instructor.

**EDFN 525 Global Education: Theory and Practice**

★3 (*fi 6*) (either term, 3-0-0). Includes critical reflections on theoretical, curriculum, and research themes in global education, peace education, development education, and other related fields. Global literacy in South and North contexts will be studied and implications drawn for creative curriculum and pedagogical strategies. The state of research on issues and problems of global education will be examined and students encouraged to develop possible proposals for assessing how teaching and learning global issues for peaceful features may be enhanced. Prerequisite: consent of Department.

**EDFN 530 History of Education in Canada**

★3 (*fi 6*) (either term, 3-0-0). A survey of studies in the history of formal and informal educational institutions in Canada, and their interrelationship with Canadian society.

**EDFN 536 Women's Education and Historiography**

★3 (*fi 6*) (either term, 3-0-0). A feminist critique of the discourse on women's education, female culture and experience, using a historiographical approach as an analytical tool. Gender-based arguments will be analyzed in appropriate social and ideological settings. These will include ideas on domesticity, woman's role, the ideal of the educated woman. Higher education, formal education, and girls' schooling will be studied.

**EDFN 537 Education, Feminism, and Social Policy**

★3 (*fi 6*) (either term, 3-0-0). Post World War II social policy and women's participation in postsecondary education, the workforce, and politics.

**EDFN 541 History of Higher Education**

★3 (*fi 6*) (either term, 3-0-0).

**EDFN 543 Research Methods and Theory in the History of Education**

★3 (*fi 6*) (either term, 3-0-0).

**EDFN 546 Childhood and Childrearing in Western Culture: An Historical Perspective**

★3 (*fi 6*) (either term, 3-0-0).

**EDFN 547 History of English Education Since the Industrial Revolution**

★3 (*fi 6*) (either term, 3-0-0).

**EDFN 550 Philosophical Analysis and Education**

★3 (*fi 6*) (either term, 3-0-0).

**EDFN 553 Philosophical Analysis of Teaching**

★3 (*fi 6*) (either term, 3-0-0).

**EDFN 554 Philosophical Foundations of Educational Research**

★3 (*fi 6*) (either term, 3-0-0).

**EDFN 555 Moral Education: A Philosophical Perspective**

★3 (*fi 6*) (either term, 3-0-0). An introduction to current philosophical research on moral education and the implications of that research for contemporary schooling.

**EDFN 557 Learning and the Philosophy of Knowledge**

★3 (*fi 6*) (either term, 3-0-0).

**EDFN 558 Religious Education: A Philosophical Perspective**

★3 (*fi 6*) (either term, 3-0-0). Rival philosophical views on the aims and limits of religious education will be examined, with particular emphasis on the implications of such views for pedagogy and curricula in denominational and nondenominational schools.

**EDFN 559 Schooling and Social Justice**

★3 (*fi 6*) (either term, 3-0-0). An examination of how educational practices may be assessed, and where necessary, changed, according to the standards of justice and respect for human rights.

**EDFN 560 Education from a Sociological Perspective**

★3 (*fi 6*) (either term, 3-0-0).

**EDFN 561 Community Education: A Sociological Perspective**

★3 (fi 6) (either term, 3-0-0). The organization and processes of community education at the local, provincial and national levels of social interaction as seen from the theory and research of contemporary sociology.

**EDFN 562 Development and Theory of Sociology of Education**

★3 (fi 6) (either term, 3-0-0).

**EDFN 563 Research Methods in Sociology of Education**

★3 (fi 6) (either term, 3-0-0).

**EDFN 564 Education and Social Change**

★3 (fi 6) (either term, 3-0-0).

**EDFN 565 Sociology of Higher Education**

★3 (fi 6) (either term, 3-0-0).

**EDFN 566 Sociology of Women, Education and Work**

★3 (fi 6) (either term, 3-0-0). This course explores the complex pattern of gender stratification, education, and employment in Canada, with a focus on education and the experience of women. The course will draw on current empirical literature and sociological and feminist theory. Discussion will include consideration of formal education (certification), nonformal education, informal education, activity in a market economy, and unpaid labor. The course focus will be Canada, but consideration will be given to research related to women and development in other countries. Prerequisite: consent of Department.

**EDFN 574 Current Developments in Native Education: A Social Science Perspective**

★3 (fi 6) (either term, 3-0-0). A discussion of theoretical and methodological issues relating to Native education in Alberta together with an examination of relevant data-based studies. Prerequisite: EDPS 432 or EDPS 474 or consent of Instructor.

**EDFN 611 Research Methods in Anthropology and Education**

★6 (fi 12) (either term, 0-3s-0).

**EDFN 620 International/Intercultural Education: Disciplinary Geographic/Cultural Focus**

★6 (fi 12) (either term, 0-3s-0).

**EDFN 621 International/Intercultural Education: Methods and Substantive Research Paper**

★6 (fi 12) (either term, 0-3s-0).

**EDFN 640 History of Education**

★6 (fi 12) (either term, 0-3s-0).

**EDFN 641 History of Education: Historiography**

★6 (fi 12) (either term, 0-3s-0).

**EDFN 642 History of Education: Selected Areas**

★6 (fi 12) (either term, 0-3s-0).

**EDFN 650 The Nature of Philosophy in Education**

★6 (fi 12) (either term, 0-3s-0).

**EDFN 651 Traditional Philosophies of Education**

★6 (fi 12) (either term, 0-3s-0).

**EDFN 652 Recent Philosophy of Education**

★6 (fi 12) (either term, 0-3s-0). Prerequisite: consent of Department.

**EDFN 660 Sociology of Education**

★6 (fi 12) (either term, 0-3s-0).

**EDFN 661 Sociological Theory in Education**

★6 (fi 12) (either term, 0-3s-0).

**EDFN 662 Sociology of Education: Research Methodology**

★6 (fi 12) (either term, 0-3s-0).

## 201.69 Education - Instructional Technology, EDIT

Department of Educational Psychology  
Faculty of Education

### 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 537 Internet/Intranet Server Management**

★3 (fi 6) (either term, 3-0-3). Managing the school/organization network. Prerequisites: EDPY 497/597 The Internet: Communicating, Accessing, and

Providing Information or EDCTS 477/500 Computer Networking in Education or equivalent experience or consent of the instructor. Access to an NT 4.0 server, Internet or an Intranet and working knowledge of TCP/IP networking and basic HTML.

**EDIT 568 Exploring Computer Based Instruction**

★3 (fi 6) (either term, 3-0-3). An introduction to the principles, foundations, and techniques of all types of computer-based instruction including multimedia development with Authorware; web-based instruction; computer mediated communication; and others.

**EDIT 571 Instructional Technology and Communication**

★3 (fi 6) (either term, 3-0-0). Instructional technology extends the ability of the instructor and students to communicate. Multimedia elements of computer-based instruction possess strengths and limitations as communication tools. This course examines various theories of communication and their application to the multimedia world of instructional technology to traditional and non-traditional learning settings. Research in the field as it applies to various learning outcomes is emphasized.

**EDIT 572 Topics in Computer-Based Instruction**

★3 (fi 6) (either term, 3-0-3). Prerequisite: EDIT 568 or consent of Department.

**EDIT 573 Designing Technology-Based Instruction**

★3 (fi 6) (second term, 3-0-0). This course 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. The course also deals with newer alternatives to conventional ISD especially constructivist approaches.

**EDIT 574 Planning the Technology Program**

★3 (fi 6) (either term, 3-3s-0).

**EDIT 575 Advanced Computer-Based Instruction**

★3 (fi 6) (either term, 3-0-3). Prerequisites: EDIT 568 and 572 or consent of Department.

**EDIT 576 Current Trends in Instructional Technology**

★3 (fi 6) (either term, 3-0-0).

**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). Prerequisites: EDIT 568 and 572, consent of Department.

**EDIT 585 Introduction to Educational Programming Environments**

★3 (fi 6) (either term, 3-0-3). A course in computer programming for education graduate students in instructional technology, career technology studies, measurement and evaluation, and curriculum. Prerequisite: EDIT 568 or equivalent, or consent of Department.

**EDIT 587 Programming Environments for Developing Interactive Learning Materials**

★3 (fi 6) (either term, 3-0-3). A second course in computer programming specifically for the development of interactive learning materials. Prerequisite: EDIT 585 or equivalent.

## 201.70 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 and EDPY 200 except for After Degree students. Corequisite: EDEL 300 and EDPY 325 (Elementary), Education Minor and EDPY 350 (Secondary). Students may not receive credit for both EDPS 310 and EDSEC 200.

**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 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 403 Development Course 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: EDPS 310. Students may not receive credit for both EDPS 410 and EDADM 401.

**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: A Study of Education in Selected Areas in Asia, Africa and Latin America**

★3 (fi 6) (either term, 3-0-0). 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, Metis, 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 435 Child Abuse and Advocacy Since 1800**

★3 (fi 6) (either term, 3-0-0). History of the social claims marketplace with regard to the rearing, socialization, care, and protection of children since 1800. Students may not receive credit for both EDPS 435 and EDFDN 435.

**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, Metis 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 502 Conference Course on Selected Topics**

★6 (fi 12) (two term, 3-0-0). Prerequisite: consent of Department.

**EDPS 503 Research Projects I**

★3 (fi 6) (either term, 3-0-2). Prerequisite: consent of Department.

**EDPS 504 Research Projects II**

★3 (fi 6) (either term, 3-0-2). Prerequisite: consent of Department.

**EDPS 505 Individual Directed Laboratory Study**

★1-12 (variable) (either term, 0-6L-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 508 Research Design**

★3 (fi 6) (either term, 3-0-0). The purpose of this course is to introduce students to the concepts of social science research. The purpose of the course is not to provide total operational competence in any one method of research but rather to provide an understanding of the nature of the various approaches to research that may be used in studying educational phenomena.

**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 601 Selected Topics in Educational Policy Studies**

★3 (fi 6) (either term, 3-0-0).

**EDPS 602 Selected Topics in Educational Policy Studies**

★6 (fi 12) (two 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 900 Directed Research Project**

★6 (fi 12) (variable, unassigned).

**201.71 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****0 EDPY 200 Educational Psychology for Teaching**

★3 (fi 6) (either term, 2-1s-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.

**1 EDPY 202 Technology Tools for Teaching and Learning**

★3 (fi 6) (either term, 3-0-3). EDPY 202 will provide 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 EDPY 202 and EDPY 302 or EDPY 485. Students are encouraged to register in this course as early in their program as possible.

**EDPY 301 Inclusive Education: Adapting Instruction for Students with Special Needs**

★3 (fi 6) (either term, 3-0-0). This course reviews educationally relevant characteristics of students exhibiting mild, moderate, and severe disabilities, and exceptional educational gifts and talents. In addition, the needs of students with diverse educational, cultural, and linguistic backgrounds will be discussed. The major focus is on planning Individual Program Plans and adapting regular classroom instruction and management to the diversity of individual needs. More specialized techniques are reviewed as needed. Note: This course is part of the Introductory Professional Term. Prerequisites: EDPY 200 and EDFX 200, except for After Degree students. Corequisite: EDFX 325 or 350 and EDPS 310. Students may not receive credit for both EDPY 301 and EDPY 151 or EDPY 341.

**EDPY 303 Educational Assessment**

★3 (fi 6) (either term, 3-0-0). 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. Note: This course is part of the Introductory Professional Term.

**0 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.

**0 EDPY 412 Language and Cognition in the Education of the Child**

★3 (fi 6) (either term, 3-0-0). Prerequisite: EDPY 200. Students may not receive credit for both EDPY 412 and EDPY 473.

**EDPY 414 Bilingualism and Cognition in the Education of the Child**

★3 (fi 6) (either term, 3-0-0). Prerequisite: EDPY 200. Students may not receive credit for both EDPY 414 and EDPY 471.

**EDPY 416 Introduction to the Teaching of English as a Second Language**

★3 (fi 6) (either term, 3-0-0). This course focuses on principles of language learning, language learners, and learning contexts. Prerequisite: Successful completion of practicum requirements or teaching experience; or consent of Department. Prerequisite/Corequisite: An approved introductory course in Linguistics. Students may not receive credit for both EDPY 416 and EDPY 430.

**EDPY 418 Methods and Programs in the Teaching of English as a Second Language to Adults**

★3 (fi 6) (either term, 3-0-0). Prerequisite: EDPY 416. Students may not receive credit for both EDPY 418 and EDPY 439.

**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 436 Applied Health Psychology and Education**

★3 (fi 6) (either term, 3-0-3). Students may not receive credit for both EDPY 436 and EDPY 436.

**EDPY 442 Introduction to Counselling**

★3 (fi 6) (either term, 1.5-1.5s-0). Prerequisite: EDPY 200. Students may not receive credit for both EDPY 442 and EDPY 413.

**EDPY 446 Educational and Vocational Guidance in the Classroom**

★3 (fi 6) (either term, 3-0-0). Prerequisite: EDPY 200. Students may not receive credit for both EDPY 446 and EDPY 419.

**EDPY 452 Assessment and Instruction of Exceptional Learners**

★3 (fi 6) (either term, 3-0-1). Note: Special Education Minor-Elementary and Secondary Routes only. Prerequisite: Introductory Professional Term. Students may not receive credit for both EDPY 452 and EDPY 355 or EDPY 307.

**EDPY 454 Behavioral Management of Severely Disruptive Children**

★3 (fi 6) (either term, 3-0-1). Note: Special Education Minor-Elementary Route and Secondary Route only. Prerequisite: Introductory Professional Term. Students may not receive credit for both EDPY 454 and EDPY 307 or EDPY 357.

**EDPY 456 Consultation and Collaboration in Special Education**

★3 (fi 6) (either term, 3-0-1). Note: Special Education Minor-Elementary Route only. Prerequisite: Introductory Professional Term.

**EDPY 458 Advanced Assessment and Instruction of Exceptional Learners**

★3 (fi 6) (either term, 3-0-0). Note: Restricted to Special Education Minors in the Elementary Route only. Prerequisite: EDPY 452. Students may not receive credit for both EDPY 458 and EDPY 359.

**EDPY 468 Individualizing Instruction for Adolescents with Special Needs**

★3 (fi 6) (either term, 3-0-1). Note: Special Education Minors-Secondary Route only. Corequisite: Introductory Professional Term. Students may not receive credit for both EDPY 468 and EDPY 309.

**EDPY 470 Deafness: An Introduction and Survey**

★3 (fi 6) (either term, 3-0-2). A basic survey of the field of education of the hearing impaired. Covers theory and practice from an historical and a current perspective. A desirable prerequisite for uninitiated students entering the hearing impaired program. Students may not receive credit for both EDPY 470 and EDPY 449.

**EDPY 472 Introduction to Language Development**

★3 (fi 6) (either term, 3-0-1). The course content includes cognitive and social basis for language, as well as an overview of recent developments in semantic, syntactic, pragmatic and phonological development. The course focuses specifically on the impact of hearing loss on language development. Students may not receive credit for both EDPY 472 and EDPY 450.

**EDPY 474 Basic Manual Communication**

★3 (fi 6) (either term, 2-1s-1). This is a practical course to develop basic skills in manual communication. Students may not receive credit for both EDPY 474 and EDPY 451.

**EDPY 478 Psychology and Education of Gifted Children**

★3 (fi 6) (either term, 3-0-3). Prerequisite: EDPY 200.

**EDPY 480 Introduction to Computer-Based Instruction**

★3 (fi 6) (either term, 3-0-3). Prerequisite: EDPY 202 or EDPY 485 or an introductory course in computing science. Students may not receive credit for both EDPY 480 and EDPY 479.

**EDPY 485 Technology Tools for Teaching and Learning**

★3 (fi 6) (either term, 3-0-3). EDPY 485 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, and tools such as those for editing digital video

and sound, and those for desktop publishing. Students may not receive credit for both EDPY 485 and EDPY 202 or EDPY 302.

**EDPY 486 Interactive Multimedia**

★3 (fi 6) (either term, 3-0-3). This lab course emphasizes the design and development of instructional lessons which incorporate learning with multimedia. Students create lessons to meet a defined instructional need or goal for a specified population of learners. The lessons employ principles of interactive design plus the multimedia elements of static and dynamic visual displays, audio, and color. They are synthesized into a coherent and tested lesson using one of several multimedia authoring systems. Final projects are distributed on CD-ROM. Prerequisite: EDPY 202 or EDPY 485 or an introductory course in computing science. Credit will not be granted for both EDPY 486 and EDPY 568.

**EDPY 487 Curricular Integration of Learning Technology**

★3 (fi 6) (either term, 3-0-0). Note: Instructional technology minors - Secondary Route only. Corequisite: EDPY 310 and EDPY 350. Prerequisite: EDPY 202 or 485 or an introductory course in computing science.

**EDPY 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. Students have flexibility with respect to choice of specific topics as this course is taught using an alternative delivery format. Prerequisite: EDPY 202 or 485 or an introductory course in computing science.

**EDPY 489 Designing Technology Based Instruction**

★3 (fi 6) (either term, 3-0-0). 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: EDPY 485 or consent of Department. Students may not receive credit for both EDPY 489 and EDPY 473.

**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: consent of Department is required for all 500- and 600-level courses.

**EDPY 500 Introduction to Data Analysis in Educational Research**

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

**EDPY 501 Introduction to Methods of Educational Research**

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

**EDPY 502 Single Subject Research Design**

★3 (fi 6) (first term, 3-0-0). Relates to profoundly or severely mentally retarded, multiply handicapped persons. Offered alternate years. Prerequisite: consent of Department.

**EDPY 503 Qualitative Methods of Education Research**

★3 (fi 6) (either term, 3-0-3). Prerequisite: EDPY 501 or equivalent or consent of Department.

**EDPY 504 Non-parametric Statistical Inference in Educational Research**

★3 (fi 6) (either term, 3-0-0). Prerequisites: EDPY 500 or equivalent and 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 Seminar and Research in Educational Measurement**

★3 (fi 6) (second term, 3-0-0). Prerequisites: EDPY 507 or equivalent and consent of Department.

**EDPY 509 Human Development Education**

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

**EDPY 510 Learning, Cognition and Education**

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

**EDPY 511 Theories of Personality**

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

**EDPY 513 Language, Cognition, and Bilingualism: An Interdisciplinary Approach**

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

**EDPY 516 Education and Psychology in Developing Countries**

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

**EDPY 517 Adolescent Behavior: Theories and Issues**

★3 (*fi 6*) (either term, 3-0-0). The emphasis in this course is on the theories and issues related to adolescent behavior.

**EDPY 528 Patterns of Interpersonal Relating**

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

**EDPY 532 Systems of Counselling**

★3 (*fi 6*) (either term, 3-0-0). This course will introduce students, with interests in counselling, to the major theories utilized in the counselling/psychotherapy area. Prerequisites or corequisites: EDPY 511 or equivalent and consent of Department.

**EDPY 533 Basic Skills, Issues, and Attitudes in Counselling I**

★3 (*fi 6*) (either term, 3-3s-4). This course will focus on generic counselling skills and the enhancement of counsellor self-awareness. Prerequisites or corequisites: EDPY 511 or equivalent and consent of Department.

**EDPY 534 Basic Skills, Issues and Attitudes in Counselling II**

★3 (*fi 6*) (either term, 3-3s-4). Prerequisites: EDPY 533 or equivalent and consent of Department.

**EDPY 535 Family Counselling: Advanced Practicum**

★3 (*fi 6*) (either term, 3-0-3). Prerequisites: EDPY 533 or equivalent and consent of Department.

**EDPY 536 Principles of Professional Practice in Educational Psychology**

★3 (*fi 6*) (either term, 3-1.5s-0). 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). Prerequisite: consent of Department.

**EDPY 549 Advanced Course in 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. Prerequisites: EDPY 452 and consent of Department.

**EDPY 553 Practicum and Capping Exercise: General Special Education**

★3 (*fi 6*) (either term, 0-1s-3). Supervised practicum in a variety of special education settings. Normally taken near the end of the course-based Master's program; capping exercise will be a paper or other product prepared in conjunction with the practicum. Prerequisite: consent of Department.

**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 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 558 Development and Learning of Exceptional Children and Adults**

★3 (*fi 6*) (either term, 3-0-0). A consideration of the value of current theories in learning and development for understanding exceptional children. Prerequisites or corequisites: EDPY 509, 548 and 510 or equivalent and 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 562 Research Project in Special Education**

★3 (*fi 6*) (either term, 0-3s-0). Following the prerequisite course on research on exceptionalities (EDPY 560), participants develop, pilot and report upon a research

plan of their own in the field of exceptionalities. This project is often the precursor to master's thesis projects. Prerequisites: EDPY 560 or equivalent and consent of Department.

**EDPY 564 Oral Communication in the Instruction of Hearing Impaired Students**

★3 (*fi 6*) (either term, 2-1s-2). A practical course to develop speech teaching skills in intending teachers of hearing impaired students. Focuses on analytical and synthetical approaches to teaching speech and speech reading. Note: Limited to Special Education students in the Hearing Impaired Program or practising teachers of the hearing impaired. Prerequisite: consent of Department.

**EDPY 565 Manual Communication in the Instruction of Hearing Impaired Students**

★3 (*fi 6*) (either term, 2-1s-1). Develops skills in expressive and receptive manual communication in intending teachers of hearing impaired students. Focuses on the use of these skills in a classroom setting, rather than on the training of interpreters. Limited to Special Education students in the Hearing Impaired Program or practising teachers of the hearing impaired. Prerequisite: consent of Department.

**EDPY 566 Curriculum Design and Instructional Strategies for Hearing Impaired Students**

★3 (*fi 6*) (either term, 2-1s-1). Explores the need for an integrated approach in planning and adapting existing curricula to meet the needs of hearing impaired students. The course will also explore the use of different instructional techniques with hearing impaired students. Prerequisite: consent of Department.

**EDPY 567 Social Psychology of Hearing Impairment**

★3 (*fi 6*) (either term, 2-0-2). A course designed to develop an understanding of basic psychological social processes associated with deafness. It will emphasize preventative techniques in mental health and will foster empathy with the personal and social needs of deaf students. Prerequisite: consent of Department.

**EDPY 569 Language Development and Remediation with Hearing Impaired Students**

★3 (*fi 6*) (either term, 1-1s-3). Application and development of the skills acquired in the two first level communication courses. Focuses on evaluation and analytical skills and on a diagnostic/prescriptive approach. Prerequisites: A basic course in communication processes and consent of Department.

**EDPY 570 Practicum in Education of Hearing Impaired Students**

★1-12 (*variable*) (variable, variable). Supervised placement in a classroom for hearing impaired students. Prerequisite: consent of Department.

**EDPY 571 Internship and Capping Exercise: Hearing Impaired Students**

★1-12 (*variable*) (variable, variable). Supervised placement with hearing impaired students. Normally taken near the end of the course-based Master's program; capping exercise will be a paper or other product prepared in conjunction with the practicum. Prerequisite: consent of Department.

**EDPY 574 Oral/Auditory Rehabilitation in the Instruction of Hearing Impaired Students**

★3 (*fi 6*) (either term, 2-1s-2). A practical course to develop speech teaching skills for teachers of hearing impaired students. This course incorporates auditory training techniques and is intended for students specializing in working with students who have impaired hearing. Prerequisites: EDPY 564 or equivalent, and consent of Department.

**EDPY 578 Severe Disabilities: Behavior Management**

★3 (*fi 6*) (either term, 3-0-0). Relates to profoundly or severely mentally/multiply handicapped persons. Prerequisite: consent of Department.

**EDPY 580 Severe Disabilities: Assessment and Instruction**

★3 (*fi 6*) (either term, 3-0-0). Relates to profoundly or severely mentally/multiply handicapped persons. Prerequisite: consent of Department.

**EDPY 582 Severe Disabilities: Assessment and Communications**

★3 (*fi 6*) (second term, 3-0-0). Relates to profoundly or severely mentally/multiply handicapped persons. Alternates between second and spring term. Prerequisite: consent of Department.

**EDPY 584 Severe Disabilities: Physical Aspects**

★3 (*fi 6*) (either term, 3-0-0). Relates to profoundly or severely mentally/multiply handicapped persons. Prerequisite: consent of Department.

**EDPY 589 Early Intervention Programs**

★3 (*fi 6*) (either term, 0-0-4). An in-depth review and analysis of early intervention programs with at-risk and established-risk infants and young preschool children with a special emphasis upon family-based programs. Prerequisite: 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 592 Psychology and Education of Gifted Children**

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

**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 ESL in Canada**

★3 (fi 6) (either term, 3-0-0). This course focuses on political, curricular, social, and cultural factors that have an impact on the ESL classroom.

**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 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) (two term, 0-1.5s-0). Prerequisite: consent of Department.

**EDPY 608 Selected Topics in Educational Measurement**

★3 (fi 6) (either term, 3-0-0). Prerequisites: EDPY 507 or equivalent and consent of Department.

**EDPY 609 Selected Topics in Human Development**

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

**EDPY 610 Selected Topics in Learning, Cognition and Instruction**

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

**EDPY 630 Doctoral Internship**

★6 (fi 12) (two term, 0-6L-3). Prerequisites: EDPY 633 or 640/641 and completion of candidacy examination and consent of Department.

**EDPY 632 History and Systems**

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

**EDPY 633 Generic Orientation to Counselling Practice**

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

**EDPY 634 Advanced Counselling Practicum**

★3 (fi 6) (either term, 3-3s-3).

**EDPY 635 Counselling Speciality: Theory and Practice**

★3 (fi 6) (either term, 3-3s-3).

**EDPY 640 Advanced Psychological Assessment: Theories and Models**

★3 (fi 6) (either term, 3-0-0). Prerequisites: EDPY 545 or equivalent, and consent of Department.

**EDPY 641 Advanced Personality Assessment: Objectives and Projective Testing**

★3 (fi 6) (either term, 3-0-3). Prerequisites: EDPY 545 or equivalent, and consent of Department.

**EDPY 642 Applied Neuropsychological Assessment: Clinical Counselling and School**

★3 (fi 6) (either term, 3-0-3). Prerequisites: EDPY 545 and one of EDPY 640 or 641, or equivalent, and consent of Department.

**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 Project**

★3 (fi 6) (variable).

**Undergraduate Courses****EDSE 245 Education Band I**

★3 (fi 6) (either term, 3-0-0). This course examines school band literature, rehearsal techniques, instrumental techniques, conducting and school music program administration through a process of practical application. Prerequisite: successful completion of an audition on a band instrument during the first week of classes, and MUSIC 140 or 141.

**EDSE 312 Curriculum and Teaching for Secondary School Art Minors**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★9 in the Minor subject area. Corequisite: EDPS 310 and EDFX 350. Students may not receive credit for both EDSE 312 and EDSEC 214.

**EDSE 317 Curriculum and Teaching for Secondary School Career and Technology Studies: Business and Technology Minors**

★3 (fi 6) (either term, 3-0-0). Prerequisites: ★9 in the Minor subject area, and Typing 20 and ACCTG 311; or consent of Department. Corequisite: EDPS 310 and EDFX 350. Students may not receive credit for both EDSE 317 and EDSEC 219.

**EDSE 322 Curriculum and Teaching for Secondary School Drama Minors**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★9 in the Minor subject area. Corequisite: EDPS 310 and EDFX 350. Students may not receive credit for both EDSE 322 and EDSEC 224.

**EDSE 327 Curriculum and Teaching for Secondary School English Language Arts Minors**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★9 in the Minor subject area. Corequisite: EDPS 310 and EDFX 350. Students may not receive credit for both EDSE 327 and EDSEC 229.

**EDSE 332 Curriculum and Teaching for Secondary School Career and Technology Studies: Human Ecology Minors**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★9 in the Minor subject area. Corequisite: EDPS 310 and EDFX 350. Students may not receive credit for both EDSE 332 and EDSEC 234.

**EDSE 337 Curriculum and Teaching for Secondary School Mathematics Minors**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★9 in the Minor subject area. Corequisite: EDPS 310 and EDFX 350. Students may not receive credit for both EDSE 337 and EDSEC 239.

**EDSE 343 Curriculum and Teaching for Secondary School Music Minors**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★9 in the Minor subject area. Corequisite: EDPS 310 and EDFX 350. Students may not receive credit for both EDSE 343 and EDSEC 244.

**EDSE 345 Education Band II**

★3 (fi 6) (either term, 3-0-0). This course examines school band literature, rehearsal techniques, instrumental techniques, conducting and school music program administration through a process of practical application. Prerequisite: EDSE 245.

**EDSE 347 Curriculum and Teaching for Secondary School Physical Education Minors**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★9 in the Minor subject area. Corequisite: EDPS 310 and EDFX 350. Students may not receive credit for both EDSE 347 and EDSEC 249.

**EDSE 352 Curriculum and Teaching for Secondary School Biological Sciences Minors**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★9 in the Minor subject area. Corequisite: EDPS 310 and EDFX 350. Students may not receive credit for both EDSE 352 and EDSEC 254.

**EDSE 360 Curriculum and Teaching for Secondary School General Sciences Minors**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★9 in the Minor subject area. Corequisite: EDPS 310 and EDFX 350.

**EDSE 364 Curriculum and Teaching for Secondary School Physical Sciences Minors**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★9 in the Minor subject area. Corequisite: EDPS 310 and EDFX 350. Students may not receive credit for both EDSE 364 and EDSEC 266.

**EDSE 365 Curriculum and Teaching for Secondary School Environment Education Minors**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★9 in the Minor subject area. Corequisite: EDPS 310 and EDFX 350. Students may not receive credit for both EDSE 463 and EDSE 365.

**EDSE 368 Curriculum and Teaching for Secondary School Second Language Minors**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★9 in the Minor subject area. Corequisite: EDPS 310 and EDFX 350. Students may not receive credit for both EDSE 368 and EDSEC 270.

**201.72 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.

**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. Corequisite: EDPS 310 and EDFX 350. Students may not receive credit for both EDSE 369 and EDSEC 271.

**EDSE 373 Curriculum and Teaching for Secondary School Social Studies Minors**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★9 in the Minor subject area. Corequisite: EDPS 310 and EDFX 350. Students may not receive credit for both EDSE 373 and EDSEC 275.

**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. Corequisite: EDPS 310 and EDFX 350. Students may not receive credit for both EDSE 378 and EDSEC 280.

**EDSE 388 Curriculum and Teaching for Secondary School Career and Technology Studies: Technology Education and Instructional Technology Minors**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★9 in the Minor subject area. Corequisite: EDPS 310 and EDFX 350.

**EDSE 393 Curriculum and Teaching for Secondary School Career and Technology Studies: Resources Minors**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ★9 in the Minor subject area. Corequisite: EDPS 310 and EDFX 350.

**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 the full session. Prerequisites: consent of instructor and Department.

**EDSE 412 Curriculum and Teaching in Secondary School Art I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: Introductory Professional Term and ★24 in the Major Subject area. Students may not receive credit for both EDSE 412 and EDSEC 314.

**EDSE 413 Curriculum and Teaching in Secondary School Art II**

★3 (*fi 6*) (either term, 3-0-0). Pre-/corequisite: EDSE 412. Students may not receive credit for both EDSE 413 and EDSEC 315.

**EDSE 417 Curriculum and Teaching in Secondary School Career and Technology Studies: Business and Technology I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: EDBU 341, Introductory Professional Term, and ★21 in the Major subject area. Students may not receive credit for both EDSE 417 and EDSEC 319.

**EDSE 418 Curriculum and Teaching in Secondary School Career and Technology Studies: Business and Technology II**

★3 (*fi 6*) (either term, 3-0-0). Pre-/corequisite: EDSE 417. Students may not receive credit for both EDSE 418 and EDSEC 320.

**EDSE 422 Curriculum and Teaching in Secondary School Drama I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: Introductory Professional Term, DRAMA 383 and ★21 in the Major subject area. Students may not receive credit for both EDSE 422 and EDSEC 324.

**EDSE 423 Curriculum and Teaching Secondary School Drama II**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite or corequisite: EDSE 422. Students may not receive credit for both EDSE 423 and EDSEC 325.

**EDSE 424 Theory and Practice of Drama/Theatre in Education**

★3 (*fi 6*) (either term, 3-0-3). This course is 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. The course will emphasize 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 359.

**EDSE 427 Curriculum and Teaching in Secondary School English Language Arts I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: Introductory Professional Term, and ★24 in the Major subject area. Students may not receive credit for both EDSE 427 and EDSEC 329.

**EDSE 428 Curriculum and Teaching in Secondary School English Language Arts II**

★3 (*fi 6*) (either term, 3-0-0). Pre-/corequisite: EDSE 427. Students may not receive credit for both EDSE 428 and EDSEC 330.

**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 432 Curriculum and Teaching in Secondary School Career and Technology Studies: Human Ecology I**

★3 (*fi 6*) (either term, 3-0-1). Prerequisites: Introductory Professional term, and ★24 in the Major subject area. Students may not receive credit for both EDSE 432 and EDSEC 334.

**EDSE 433 Curriculum and Teaching in Secondary School Career and Technology Studies: Human Ecology II**

★3 (*fi 6*) (either term, 3-0-1). Prerequisite or corequisite: EDSE 432. Students may not receive credit for both EDSE 433 and EDSEC 335.

**EDSE 437 Curriculum and Teaching in Secondary School Mathematics I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: Introductory Professional Term, and ★24 in the Major subject area. Students may not receive credit for both EDSE 437 and EDSEC 339.

**EDSE 438 Curriculum and Teaching in Secondary School Mathematics II**

★3 (*fi 6*) (either term, 3-0-0). Pre-/corequisite: EDSE 437. Students may not receive credit for both EDSE 438 and EDSEC 340.

**EDSE 439 Specialized Methods in Secondary School Mathematics Teaching**

★3 (*fi 6*) (either term, 3-0-0).

**EDSE 442 The Use of Computers in the Teaching and Learning of Mathematics**

★3 (*fi 6*) (either term, 3-0-1).

**EDSE 443 Curriculum and Teaching in Secondary School Music I**

★3 (*fi 6*) (second term, 3-0-0). Prerequisites: Introductory Professional term, and ★24 in the Major subject area. Students may not receive credit for both EDSE 443 and EDSEC 344.

**EDSE 444 Curriculum and Teaching in Secondary School Music II**

★3 (*fi 6*) (either term, 3-0-0). Pre-/corequisite: EDSE 443. Students may not receive credit for both EDSE 444 and EDSEC 345.

**EDSE 445 Education Band III**

★3 (*fi 6*) (either term, 3-0-0). This course examines school band literature, rehearsal techniques, instrumental techniques, conducting and school music program administration through a process of practical application. Prerequisites: EDSE 345.

**EDSE 447 Curriculum and Teaching in Secondary School Physical Education I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: PESS 294, Introductory Professional Term, and ★21 in the Major subject area. Students may not receive credit for both EDSE 447 and EDSEC 349.

**EDSE 448 Curriculum and Teaching in Secondary School Physical Education II**

★3 (*fi 6*) (either term, 3-0-0). Pre-/corequisite: EDSE 447. Students may not receive credit for both EDSE 448 and EDSEC 350.

**EDSE 452 Curriculum and Teaching in Secondary School Biological Sciences I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: Introductory Professional Term, and ★24 in the Major subject area. Students may not receive credit for both EDSE 452 and EDSEC 354.

**EDSE 453 Curriculum and Teaching in Secondary School Biological Sciences II**

★3 (*fi 6*) (either term, 3-0-0). Pre-/corequisite: EDSE 452. Students may not receive credit for both EDSE 453 and EDSEC 355.

**EDSE 456 Curriculum and Teaching in Secondary School General Sciences I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: Introductory Professional Term, and ★24 in the Major subject area. Students may not receive credit for both EDSE 456 and EDSEC 338.

**EDSE 457 Curriculum and Teaching in Secondary School General Sciences II**

★3 (*fi 6*) (either term, 3-0-0). Pre-/corequisite: EDSE 456. Students may not receive credit for both EDSE 457 and EDSEC 359.

**EDSE 460 Curriculum and Teaching in Junior Secondary School Physical Sciences**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: Introductory Professional Term, and ★24 in Major subject area. Students may not receive credit for both EDSE 460 and EDSEC 362.

**EDSE 461 Curriculum and Teaching in Senior Secondary School Physical Sciences**

★3 (fi 6) (either term, 3-0-0). Pre-/corequisite: EDSE 460. Students may not receive credit for both EDSE 461 and EDSEC 363.

**EDSE 466 Teaching Science in Its Social Context**

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

**EDSE 468 Curriculum and Teaching in Secondary School Second Language I**

★3 (fi 6) (either term, 3-0-0). Prerequisites: Introductory Professional Term, and ★24 in the Major subject area. Students may not receive credit for both EDSE 468 and EDSEC 370.

**EDSE 469 Curriculum and Teaching in Secondary School Second Language II**

★3 (fi 6) (either term, 3-0-0). Pre-/corequisite: EDSE 468. Students may not receive credit for both EDSE 469 and EDSEC 371.

**EDSE 470 Advanced Curriculum and Teaching in Second Language Education**

★3 (fi 6) (either term, 3-0-0).

**EDSE 473 Curriculum and Teaching in Secondary School Social Studies I**

★3 (fi 6) (either term, 3-0-0). Introductory Professional Term, and ★24 in the Major subject area. Students may not receive credit for both EDSE 473 and EDSEC 375.

**EDSE 474 Curriculum and Teaching in Secondary School Social Studies II**

★3 (fi 6) (either term, 3-0-0). Pre-/corequisite: EDSE 473. Students may not receive credit for both EDSE 474 and EDSEC 376.

**EDSE 475 New Approaches in Secondary School Social Studies**

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

**EDSE 478 Computer Technology Integrated into the Curriculum**

★3 (fi 6) (either term, 3-0-3). This course examines ways in which the computer can be used to encourage critical thinking in the classroom. The Internet, spreadsheets, databases and other computer technologies are used to develop classroom activities. Prerequisite: Students must be able to use the Internet to find resources and be familiar with spreadsheets and databases.

**EDSE 488 Curriculum and Teaching in Secondary School Career and Technology Studies: Technology Education I**

★3 (fi 6) (either term, 3-0-0). Prerequisites: EDSE 388, Introductory Professional Term, and ★21 in the Major subject area. Students may not receive credit for both EDSE 488 and EDSEC 390.

**EDSE 489 Curriculum and Teaching in Secondary School Career and Technology Studies: Technology Education II**

★3 (fi 6) (either term, 3-0-0). Pre-/corequisite: EDSE 488. Students may not receive credit for both EDSE 489 and EDSEC 391.

**EDSE 493 Curriculum and Teaching in Secondary School Career and Technology Studies: Resources I**

★3 (fi 6) (either term, 3-0-0). Prerequisites: EDSE 393, Introductory Professional Term, and ★21 in the Major subject area.

**EDSE 494 Curriculum and Teaching in Secondary School Career and Technology Studies: Resources II**

★3 (fi 6) (either term, 3-0-0). Prerequisite or corequisite: EDSE 493.

**EDSE 495 Curriculum and Teaching in Secondary School Career Education**

★3 (fi 6) (either term, 3-0-3). Prerequisite or corequisite: EDPS 310 and EDFX 350.

**Graduate Courses****EDSE 501 Conference Seminar in Secondary Education I**

★1-3 (variable) (variable, variable). Prerequisites: consent of instructor and Department.

**EDSE 502 Advanced Level Guided Individual Study in Secondary Education**

★1-3 (variable) (either term, variable). May be offered over the full session. 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.

**EDSE 504 Curriculum Inquiry**

★3 (fi 6) (second term, 3-0-0). This course focuses on curriculum perspectives and possibilities. Prerequisite: EDSE 503.

**EDSE 506 Searching Issues of Pedagogy in Practice: Race, Gender and Culture**

★3 (fi 6) (either term, 0-3s-0). This course will draw upon a wide range of

conceptual frameworks to consider issues of race, gender and culture within a variety of locations. Based on the work of feminist, postcolonial and critical theorists, and the analyses of various contemporary curriculum theorists, we will explore research issues relevant to questions of race, gender and culture and consider how such research and theory can contribute to the practice of a pluralistic and inclusive pedagogy. In particular, we will consider dilemmas of feminist theory and pedagogy and intersections of gender with race, class and culture, questions of identity, subjectivity and representation, and practical strategies for developing a pluralistic pedagogy in a number of sites of practice.

**EDSE 507 Postmodernism and Curriculum: Issues in Culture, Gender and Difference**

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

**EDSE 508 Media and Popular Culture in the Curriculum**

★3 (fi 6) (second 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). A course that examines the sexual politics of the pedagogical relationship.

**EDSE 510 Research Methods in Secondary Education**

★3 (fi 6) (first term, 3-0-0).

**EDSE 511 Research Design in Secondary Education**

★3 (fi 6) (second term, 3-0-0).

**EDSE 512 Research Project in Secondary Education**

★3 (fi 6) (either term, 3-0-0).

**EDSE 513 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 Department.

**EDSE 514 Arts Based Educational Research Practicum**

★3 (fi 6) (either term, 3-0-0). Prerequisites: EDSE 510 and EDSE 513 or consent of Department. Working in research teams, students design and conduct arts-based educational research in the examination of research topics of their own choosing.

**EDSE 515 Special Topics in Art Education**

★3 (fi 6) (either term, 3-0-0). This course examines special topics in art education.

**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.

**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.

**EDSE 539 Secondary Mathematics Education Research Seminar**

★3 (fi 6) (first term, 3-0-0).

**EDSE 540 Secondary Mathematics Education Teaching and Program Analysis**

★3 (fi 6) (second term, 3-0-0).

**EDSE 544 Music Learning and Pedagogy I**

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

**EDSE 545 Music Learning and Pedagogy II**

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

**EDSE 566 Science and Society: Implications for Teaching**

★3 (fi 6) (either term, 0-3s-0). A seminar course on the nature of science and social aspects of science, and implications for science teaching. Emphasis is placed on the understanding of the scientific components of current social problems, and techniques and curricula for dealing with the nature and social context of science.

**EDSE 567 Instructional Strategies in Science Teaching**

★3 (fi 6) (either term, 0-3s-0). A seminar course in which an in-depth study is made of the major techniques in science instruction. Heavy emphasis is given to research in science education and its implication for instruction.



**EDSE 568 A 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.

**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 578 Computer Technology Integrated into the Curriculum**

★3 (fi 6) (either term, 3-0-3). This course will examine ways in which the computer can be used to encourage critical thinking in the classroom. Students will use research findings, the Internet, spreadsheets, databases and other computer technologies to guide the development of classroom activities. Prerequisite skills: Students must be able to use the Internet to find resources and be familiar with spreadsheets and databases.

**EDSE 579 Integrating Technology into the Classroom: A Research Project**

★3 (fi 6) (either term, 0-3s-0). Students will develop and implement a technology related action research project. Students will focus on technology activities that may lead to gains in learning and/or lead to changes in teaching and learning. Prerequisites: EDSE 578 or consent of the Department and the student must be in a position to implement technology activities in a classroom.

**EDSE 580 Curriculum and Teaching for Religious and Moral Education**

★3 (fi 6) (either term, 3-0-0).

**EDSE 591 Evaluation of Industrial Education Programs**

★3 (fi 6) (either term, 3-0-0).

**EDSE 592 Problems and Trends in Industrial and Vocational Education**

★3 (fi 6) (either term, 3-0-0).

**EDSE 600 Secondary Education**

★6 (fi 12) (two term, 3-0-0). Reading and discussion of research, curriculum, and teaching procedures in secondary schools.

**EDSE 601 Conference Seminar in Secondary Education II**

★1-3 (variable) (variable, variable). Prerequisites: consent of instructor and Department.

**EDSE 605 Studies in Pedagogy**

★3 (fi 6) (either term, 0-3s-0). This is a course on the reflective and prereflective process in teaching, childcare or pedagogy. The focus will be on the nature of the pedagogical moment, forms of pedagogic understanding, pedagogic thoughtfulness and tact, and other selected concerns pertaining to everyday pedagogic thinking and acting. To a certain extent this course will draw on historical and modern continental thought and scholarly sources.

**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.

**EDSE 607 Action Research Practicum**

★3 (fi 6) (second term, 3-0-0). Prerequisites: EDSE 503, 504, and 606 or consent of Department.

**EDSE 608 Cognition and Curriculum**

★3 (fi 6) (either term, 3-0-0). Theories of cognition will be studied and used to interpret curriculum. Prerequisites: EDSE 503/504 or consent of the Department.

**EDSE 610 Advanced Research Topics in Secondary Education**

★3 (fi 6) (either term, 0-3s-0).

**EDSE 611 Human Science Research in Pedagogy**

★6 (fi 12) (two term, 0-3s-0). An introduction to a qualitative approach to pedagogical research and theorizing that is based on phenomenology, hermeneutics, and aspects of semiotics, critical ethnography and related human sciences.

**EDSE 614 Current Issues in Art Education**

★3 (fi 6) (first term, 3-0-0). Prerequisite: Undergraduate major in art or consent of Instructor.

**EDSE 615 Directed Study in Art Education**

★3 (fi 6) (second term, 3-0-0). Prerequisite: EDSE 614 or consent of Department.

**EDSE 629 Reading and Teaching Print and Media Texts with Adolescents**

★3 (fi 6) (either term, 0-3s-0). This course examines current theory and research on literary texts, their reading and teaching, and consider implications for classroom practice. Processes involved in reading literary texts, reader-response theories, and approaches for teaching, assessing, and researching are explored.

The implications for the secondary school curriculum or trends and developments in literary theory are considered.

**EDSE 630 Theory and Research in Secondary English Language Arts Education**

★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 667 Current Issues and Trends in Science Education**

★3 (fi 6) (either term, 0-3s-0). A seminar course in which an examination and synthesis is made of current thinking and research in science education. Topics are selected from major areas of interest including curriculum development, scientific literacy, science concept acquisition, instruction and evaluation. Emphasis is given to classroom applications of major ideas.

**EDSE 668 Issues in Second and Foreign Language Teacher Education**

★3 (fi 6) (either term, 0-3s-0). This course will address contemporary issues locally and on an international scale.

**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 900 Directed Research Project**

★3 (fi 6) (variable, unassigned).

## 201.73 Electrical and Computer Engineering/Biomedical Engineering, EE BE

Departments of Biomedical Engineering and Electrical and Computer Engineering  
Faculties of Medicine and Dentistry and Engineering

### 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 Instructor.

**EE BE 540 Digital Computer Processing of Images**

★3 (fi 6) (second 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 438 or consent of Instructor.

## 201.74 Electrical Engineering, E E

Department of Electrical and Computer Engineering  
Faculty of Engineering

**Notes**

- (1) A course listed for either term will be offered in the first term or in the second term.
- (2) In some cases prerequisite requirements may be waived with the consent of Department.

The following table lists renumbered courses:

Old	New	Old	New
E E 379	E E 280	E E 482	E E 582
E E 421	E E 521	E E 498	E E 598
E E 440	E E 570	E E 499	E E 599

## Undergraduate Courses

### E E 231 C Programming and Numerical Methods for Electrical Engineering

□3.5 (fi 6) (second term, 3-1s-0). C language programming applied to numerical techniques for solving electrical engineering problems; numerical differentiation and integration, roots of linear and nonlinear simultaneous equations, interpolation and curve-fitting, ordinary differential equations. Prerequisite: ENCMP 100 or CMPUT 114. Corequisite: E E 250. (★3)

### E E 239 Fundamentals of Electrical Engineering

□3.8 (fi 6) (either term, 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. (★3)

### E E 240 Electrical Circuits I

□4.3 (fi 6) (first term, 3-1s-3/2). Circuit element definitions. Circuit laws: KVL, KCL, Ohm's. Resistive voltage and current dividers. Basic loop and nodal analysis. Dependent sources. Circuit theorems: superposition, maximum power transfer, Thevenin, Norton. Time domain behavior of inductance and capacitance, energy storage. Sinusoidal signals, complex numbers, phasor and impedance concepts, complex power, RMS power. Resonant circuits, Three-phase power, wye and delta connections, wattmeters. Prerequisites: MATH 101, 102. (★3)

### E E 250 Electrical Circuits II

□4.3 (fi 6) (second term, 3-1s-3/2). Forced and natural time response of RL, RC, and RLC circuits using the differential equation approach. The s-plane and poles and zeroes. Forced and natural response of circuits using complex frequency analysis. Mutual inductance and the ideal transformer. Two-port networks and the y, z, h and ABCD parameters. Reciprocal networks. Introduction to the ideal operational amplifier. Prerequisites: MATH 102, 201 and E E 240. (★3)

### E E 280 Introduction to Digital Electronics

□3.8 (fi 6) (either term, 3-0-3/2). Boolean algebra including truth tables and 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. (★3)

### E E 305 Fundamentals of Electrical Engineering

□3.8 (fi 6) (second term, 3-0-3/2). Magnetic fields, forces on conductors, induced voltage. Transformers, DC motors. Synchronous machines, the induction motor, torque - speed characteristics, applications. Transistors, biasing, basic amplifiers, operational amplifiers and circuits. Silicon controlled rectifiers and applications. Prerequisite: E E 239 or equivalent. (★3)

### 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. (★3)

### E E 316 Engineering Electromagnetics II

□3 (fi 6) (either term, 3-0-0). Transient and time harmonic signals in transmission lines, including impedance matching and the Smith Chart. Rectangular wave guides. Introduction to radiation and antennas. Prerequisite: E E 315. (★3)

### E E 317 Electromagnetics for Computer Engineers

□3 (fi 6) (second term, 3-0-0). Review of electrostatics, magnetostatics and vector theorems. Introduction to Maxwell's equations. Ideal transmission line, wave equation, travelling waves. Characteristic impedance, reflection coefficient, power flow, multiple reflections and transient response of a transmission line. AC steady-state and lossy transmission lines. Smith chart, plane wave propagation, reflection and transmission coefficients. Implications on transmission rates of digital data. Local area networks, instrumentation buses. Prerequisite: PHYS 230 or equivalent. (★3)

### E E 323 Analytical Methods of Electrical Engineering

□3.5 (fi 6) (either term, 3-1s-0). Applications of the theory of partial differential equations to Maxwell's equations, heat flow problems, the transmission line equation and Laplace's equation. Transform methods and special functions. Prerequisites: E E 335 and MATH 309. (★3)

### E E 330 Introduction to Power Engineering

□3 (fi 6) (first term, 3-0-0). DC and AC magnetic circuit analysis. Ideal and non-ideal transformers. Ideal and non-ideal autotransformers. Three phase transformers. Mechanical forces and magnetic devices. Modelling and analysis of transducers. Prerequisite: E E 240. (★3)

### E E 332 Electric Machines

□3.8 (fi 6) (either term, 3-0-3/2). Theory, basic concepts and characteristics of DC machines; generators and motors. Induction motor theory. Synchronous machine theory. Fractional HP motor theory. Prerequisite: E E 330. (★3)

### E E 335 Signals and Transform Methods

□3.5 (fi 6) (first term, 3-1s-0). Classes of signals and systems; impulse functions, impulse response and convolution; Fourier and Laplace transforms and applications; discrete time signals and Z-transform. Prerequisites: E E 250; MATH 102 and 201 or equivalent; MATH 309. (★3)

### E E 340 Electronics: Active Devices

□4.3 (fi 6) (first term, 3-1s-3/2). PN junction semiconductor basics, charge flow and diode equation. Diodes: clipping and clamping circuits, bridge rectifier, capacitive filtering, and zener regulator. Power supply design. Bipolar junction transistor (BJT): operation and its small-signal hybrid- $\pi$  model. BJT amplifier basics: biasing, DC/AC load line viewpoint, gain. Rin and Rout properties, analysis and design. JFET and MOSFET Field Effect device operation with application to amplifiers. Prerequisite: E E 250. (★3)

### E E 350 Electronics: Analog Circuits

□4.3 (fi 6) (either term, 3-1s-3/2). Op-amp as ideal 3-terminal device, virtual ground concept, linear versus nonlinear (switched) operation, design and applications. Differential amplifiers (BJT and MOSFET). Biasing with current mirrors. Common-mode (noise) rejection, I and V offsets. Frequency response of amplifiers: basic high frequency model, dominant pole calculation and design. Frequency performance comparison of design topologies. Common op-amp circuit design. Feedback application in amplifier circuits (VCVS). Prerequisite: E E 340. (★3)

### E E 358 Introduction to Linear Systems

□3 (fi 6) (either term, 3-0-0). Transfer functions and linear models of physical systems. Block diagrams and signal flow graphs. Control system characteristics and feedback compensators. System time responses. System stability and Routh stability criterion. Root locus method. Compensator design in time-domain. Prerequisites: E E 250, 335. (★3)

### E E 365 Technical Communications

□3 (fi 6) (either term, 3-0-0). Technical approach to writing, pyramid technique, technical correspondence, references, critiques of written assignments. Time management, engineering professionalism, brainstorming, IEEE paper contest, changing engineering profession, working in groups and group dynamics. Extemporaneous oral presentations, semi-formal and formal oral presentations, moderating oral presentations. (★3)

### E E 380 Introduction to Microprocessors

□3.8 (fi 6) (either term, 3-0-3/2). Microcomputer architecture, assembly language programming, sub-routine handling, memory and input/output system and interrupt concepts. Prerequisite: E E 280. (★3)

### E E 387 Statistical Methods in Electrical Engineering

□3.5 (fi 6) (either term, 3-1s-0). Introduction to descriptive statistics; measures of central tendency. Probability theory: discrete sample spaces, Bayes' rule, random variables. Discrete and continuous distributions (binomial, hypergeometric, Poisson, normal, standardized normal, exponential and chi-square). Estimation and sampling theory. Hypothesis testing. Application of techniques to electrical engineering measurements, to communications, reliability, queuing, modelling and simulation studies of electrical and computer engineering systems and other areas of signal analysis. Note: This course may not be taken for credit if credit has already been obtained in STAT 235. (★3)

### E E 390 Introduction to Communication Systems

□3.4 (fi 6) (either term, 3-0-0). 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 335. (★3)

### E E 401 Engineering Design Project

□4 (fi 6) (either term, 1-0-6). Design of practical engineering system or device that involves going from concept to working prototype requiring student teams to exercise creative ability, to make assumptions and decisions based on technical knowledge. Design project requirements and selection are defined during the 3rd year Winter Term. Formal interim and final reports are required from each group. In addition, lectures once a week will develop expertise in various areas related to design. Restricted to fourth-year students only. (★3)

### E E 438 Introduction to Signal Theory and Processing

□3.4 (fi 6) (either term, 3-0-3/4). Discrete-time signals and systems; sampled signals and sampling theorem; the z-transform; design of digital filters; discrete Fourier transform, the periodogram. Fast Fourier transform, algorithms, aliasing, leakage; spectral analysis, applications. Prerequisite: E E 335. (★3)

### E E 445 C/C++ Programming for Engineers

□4.5 (fi 6) (either term, 3-0-3). Applications of C/C++ programming language for solving practical engineering problems. Special attention to programming methodology for engineers, communication with external devices. Modular programming in C-exchange of variables, header files, and project files. Introduction to engineering graphics using C. Engineering data handling and acquisition, on-line visualization and processing. Modular programming in C++. Classes and objects. Data abstraction, inheritance, and polymorphism. Prerequisite: E E 231 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in CMPUT 201. (★3)

**E E 458 Control Systems I**

□3.8 (fi 6) (either term, 3-0-3/2). Review of time-domain analysis and design methods. Frequency response methods. Body plots and Nyquist diagrams. Nyquist stability criterion. Phase and gain margins. Compensator design in frequency-domain. Nichols chart. Discrete-time systems. Digital system responses. Stability and Jury's stability criterion. Z-plane and root locus method. W-transform and frequent method. Deadbeat design and digital design. Introduction to industrial PLC control design. Prerequisites: E E 358 and MATH 309. Prerequisite or corequisite: E E 438. Note: This course may not be taken for credit if credit has already been obtained in either E E 462 or 469. (★3)

**E E 462 Control Systems for Computer Engineers**

□3.8 (fi 6) (second term, 3-0-3/2). Linear models of control systems. PID controller transient response and tuning. Stability analysis. Root locus method. Bode plots and frequency domain analysis and design. State space techniques. Discrete-time system modelling and digital controller design. Prerequisites: E E 335 and 438. Note: This course may not be taken for credit if credit has already been obtained in either E E 458 or 469. (★3)

**E E 469 Feedback Control Systems for Mechanical Engineers**

□3.8 (fi 6) (second term, 3-0-3/2). Laplace transforms. Linear models of physical systems. Transient response and system performance. Stability and Routh criterion. PID regulator transient response and tuning methods. Root locus. Bode plots and frequency response analysis and design. Prerequisite: MATH 201. Note: This course may not be taken for credit if credit has already been obtained in either E E 458 or 462. (★3)

**E E 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. Prerequisite: E E 280. (★3)

**E E 494 Research Project Seminar**

□0.5 (fi 2) (either term, 0-1s-0). Organizational seminars for the research project in the following term. (★1)

**E E 495 Research Project**

□3 (fi 6) (either term, 0-0-6). Engineering Physics student research projects. (★3)

**E E 513 Variable Speed Drives Lab**

□3.5 (fi 6) (second term, 0-1s-6). Laboratory testing of industrial drive systems: 3-phase diode rectifiers and harmonics; 3-phase full-wave SCR phase-controlled rectifier; DC drive; 3-phase phase-controlled semiconductor rectifier; variable-voltage square-wave inverter drive; PWM voltage source inverter drive; soft-start; 12-pulse diode rectifier with delta-delta and delta-Y transformer. Prerequisite or corequisite: E E 531. (★3)

**E E 514 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. (★3)

**E E 521 Power Systems I**

□3 (fi 6) (either term, 3-0-0). Power system components and performance; per unit analysis of power systems; characteristics of transposed and untransposed transmission lines; transmission line models, load flow methods and Z bus building. Prerequisites: E E 250 and MATH 102. (★3)

**E E 524 Switchmode Power Supplies**

□3.4 (fi 6) (first term, 3-0-3/4). Power semiconductors: MOSFETS, IGBT, DC/DC converters; buck, boost, buck-boost, cuk. Converter operation in continuous and discontinuous conduction modes. Power supplies with high frequency isolation: flyback, push-pull, full-bridge and half-bridge. Resonant mode converters, soft-switching, resonant DC-link, parallel/series topologies. Applications and design examples. Prerequisite: E E 350. (★3)

**E E 525 Power Systems II**

□3.8 (fi 6) (either term, 3-0-3/2). Faults and unbalanced operation of power systems; symmetrical components; sequence networks; stability and control; circuit breakers; overvoltages; voltage sags; lightning and switching surges. Prerequisite: E E 521 or consent of Instructor. (★3)

**E E 527 Industrial Power Distribution**

□3 (fi 6) (either term, 3-0-0). Fundamentals of engineering design of electrical distribution systems for buildings and electrical plants. Current design practices and engineering methods. Prerequisite: E E 332. (★3)

**E E 528 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. Case studies. Prerequisite: E E 387 or equivalent. (★3)

**E E 529 Power Quality**

□3 (fi 6) (either term, 3-0-0). Introduction to power quality. Definition of power system disturbances and mathematical modelling of 80 power quality factors found in the Canadian Power Quality Measurement Protocol. Defining power system disturbance profiles and electronic and electrical equipment susceptibility characteristics. Designing mitigating equipment for the protection of electronic equipment (e.g. surge suppressors). Power system harmonic fundamentals (e.g. IEEE 519) and designing mitigating strategies. Prerequisite: E E 350. (★3)

**E E 530 Power Electronics**

□3.4 (fi 6) (first term, 3-0-3/4). Diode rectifiers. Overview of power semiconductor device technology: switching characteristics, gate drives and switching aid circuitry. Circuit topologies: Phase-controlled and diode rectifiers, DC choppers, DC drive systems, inverters, AC controllers, DC/DC converters, Switchmode power supplies. PWM control techniques. Applications and design examples. Prerequisite: E E 350. (★3)

**E E 531 Variable Speed AC Drives**

□3 (fi 6) (second term, 3-0-0). Variable speed control of induction motors. Variable frequency drives: square wave variable-voltage inverter drive, pulsewidth modulated voltage source inverter drive, current source inverter drive. Cycloconverters, slip-energy recovery drives. Specialty motor drives: permanent magnet motors, stepper motors and switched reluctance motors. Prerequisites: E E 350 and 332. (★3)

**E E 539 Digital Filter Design and Implementation**

□3.8 (fi 6) (either term, 3-0-3/2). Digital filters, digital filter structures and properties. Time-domain analysis of digital filter, frequency-domain analysis using z transforms. Digital filter realization techniques, low-sensitivity digital filters. Approximation techniques for the design of recursive digital filters. Design of nonrecursive digital filters using windowing techniques. Design of recursive and nonrecursive digital filters using numerical optimization. Finite-wordlength arithmetic effects in the design of digital filters, coefficient quantization, signal quantization, roundoff noise, overflow oscillations, scaling. Allocation of coefficient and signal wordlengths. Hardware implementation of digital filters using fixed-point or floating-point arithmetic. Practical applications in digital multimedia and digital telephony. Prerequisites: E E 380 and 438. (★3)

**E E 545 Power System Protection**

□3 (fi 6) (either term, 3-0-0). Review of power systems, relays and current transformers, per unit phasors, polarity, fundamental units, transformers. Site visit to actual power system installations, systems faults and relay coordination. (★3)

**E E 550 Design with Operational Amplifiers**

□3 (fi 6) (either term, 3-0-0). Operational amplifier fundamentals. Ideal opamp circuit analysis. Circuits with resistive feedback. Current-to-voltage and voltage-to-current converters. Instrumentation amplifiers. Transducer bridge amplifiers. Active filters. Standard second order responses. State-variable and biquad filters. Switched capacitor filters. Static opamp limitations. Bias and offset currents, input offset voltage. Input offset-error compensation. Dynamic opamp limitations. Transient response. Current feedback amplifiers. Stability. Noise properties of opamps. Opamp specifications. Prerequisite: E E 350 and E E 358 or E E 462. (★3)

**E E 552 High Level Digital ASIC Design Using CAD**

□3.5 (fi 6) (either term, 2-0-3). In this lecture and project-orientated course, students acquire and apply skills in the design of digital application-specific integrated circuit (ASIC) 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. Prerequisite: E E 480. (★3)

**E E 561 Control Systems II**

□3.8 (fi 6) (either term, 3-0-3/2). State space analysis: state space models, transfer function matrix, state space responses, eigenpair and modes, stability, controllability, observability, and stabilizability, modal decomposition, discrete-time state space analysis techniques. State space design: state feedback control design for pole-placement and optimal control, state observer design, state space design techniques for digital control systems. Nonlinear control systems: nonlinearities and nonlinear behaviors, describing function method and limit cycle stability, phase plane method, Lyapunov stability, nonlinear control system design examples. Introduction to advanced topics in control systems. Industrial control system design case studies. Prerequisite: E E 458. (★3)

**E E 562 Industrial Automation**

□3.8 (fi 6) (either term, 3-0-3/2). Review of the industrial environment, motor controls, control instrumentation and devices. PLC (Programmable Logic Controllers): architecture, real-time control, I/O layout, I/O types, interprocessor communications programming. Industrial applications, interlocking, safety, risks, justification. Loop tuning, communications, applications. Operator interfaces: simple operators, terminals, HMI (Human Machine Interfaces) package software, business system connectivity (SQL), data structures. (★3)

**E E 563 Neural Networks and Fuzzy Systems**

□3 (fi 6) (either term, 3-0-0). Introduction to neural networks and fuzzy systems. Neural dynamics. Activation and signals. Unsupervised and supervised learning algorithms. The back propagation algorithm. Neural network architecture, convergence and stability. Fuzzy sets and systems. Fuzzy associated memories. Applications of fuzzy systems and neural networks. Prerequisite: E E 240. Note: This course is offered every second year alternating with E E 565. (★3)

**E E 565 Introduction to Robotics**

□3.4 (fi 6) (either term, 3-0-3/4). Description of positions and orientations in 3-D space. Geometry of robot manipulators. Motion of robot manipulators. Control of robot manipulators. Prerequisites: MEC E 250 and E E 240. Note: This course is offered every second year alternating with E E 563. (★3)

**E E 570 Large Signal and Pulse Circuits**

□4.5 (fi 6) (either term, 3-0-3). Pulse circuit basics: sweep and Schmitt trigger circuits. Large signal BJT models. Monostable and astable multivibrator and timing circuit analysis. Digital logic gate circuits: NMOS, CMOS, TTL, ECL. Sampling circuits. D/A circuit principles, inverted R-2R ladder design. A/D circuit principles and converter types. Prerequisite: E E 350. (★3)

**E E 571 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 458 or E E 462. (★3)

**E E 572 Physical Electronics**

□3 (fi 6) (either term, 3-0-0). Crystal structures; Semiconductor quantum mechanics and band model; carrier conduction and recombination/generation, light absorption, and emission; pn junctions, Schottky junctions, heterojunctions; FET and MOSFET operation. (★3)

**E E 582 Design of Microprocessor-based Systems**

□4 (fi 6) (second 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. Prerequisites: E E 350, 380 and 480. (★3)

**E E 583 Introduction to Plasmas and Discharges**

□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. (★3)

**E E 586 Introduction to Optical Fibre Communications**

□3 (fi 6) (either term, 3-0-0). Properties of optical communication systems; dispersion, attenuation and physical properties of single mode and multimode fibres; LED and laser diode sources; photodetectors; optical coupling; system design; latest developments. Prerequisites: E E 316 or 317 and E E 350 and 390 or consent of Department. (★3)

**E E 588 Communication in Noise**

□3 (fi 6) (either term, 3-0-0). Description and analysis of random processes, characterization of noise in electric circuits, evaluation of the output signal-to-noise ratio in analog communication systems (amplitude and angle modulated), performance of digital communication systems (linear and companded pulse code modulation, binary and multilevel baseband and carrier systems) in white Gaussian noise. Prerequisites: E E 387 and 390. (★3)

**E E 589 Telecommunication Systems Engineering**

□3 (fi 6) (second term, 3-0-0). Telephony basics, subscriber loop plant, traffic theories: Poisson, Erlang B, Engset, Erlang C, efficiency of large groups. Optimum alternate route design, network architecture, 2 Wire-4 Wire conversion, loss plan for echo-loss-delay, volume, stability assurance, call routing, multi-stage circuit switch design, central office functions, time-space-time, space-time-space switching, data communication basics, system concepts: ISDN, ATM, Internet, Cellular. Prerequisites: E E 387, E E 390, E E 315 or E E 317. (★3)

**E E 591 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 250 and 316. (★3)

**E E 596 Introduction to Principles and Physics of Lasers**

□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 316 or equivalent. (★3)

**E E 597 Microwave Engineering**

□3.8 (fi 6) (either term, 3-0-3/2). Introduction to microwave engineering and wave equation review. Wave propagation and cutoff considerations. Transmission line power and mode limits. Planar and microstrip lines. Obstacles in transmission lines. Impedance matching and tuning. Quarter-wave transformer design. Microstrip transitions. Transmission line and cavity resonators. Scattering parameters and applications. Microwave transistor amplifier gain and stability design. Microwave filter design by insertion loss method. Prerequisite: E E 315. (★3)

**E E 598 Special Problems I**

□3 (fi 6) (first term, 3-0-0). (★3)

**E E 599 Special Problems II**

□3 (fi 6) (second term, 3-0-0). Courses E E 598 and 599 are 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 Faculty. (★3)

**Graduate Courses**

The following undergraduate courses may be taken for credit by graduate students: E E 514, 521, 524, 525, 527, 528, 529, 530, 531, 539, 545, 550, 552, 561, 563, 565, 570, 571, 572, 582, 583, 586, 588, 589, 591, 596, 597, 598, 599, EE BE 512, EE BE 540, BME 513.

The following courses will be offered on a regular basis, subject to demand. If no prerequisite is specified for a graduate course, permission of the instructor must be obtained before registering.

**E E 600 MSc Research Project Definition**

□0.5 (fi 1) (second term, 0-1s-0). Preparation of a report defining the proposed MSc thesis research. (★0.5)

**E E 601 Special Topics in Electrical Engineering I**

□3 (fi 6) (first term, 3-0-0). Intended to enable individual students to study special topics under the supervision of a member of the faculty. (★3)

**E E 602 Special Topics in Electrical Engineering II**

□3 (fi 6) (second term, 3-0-0). Same as E E 601, except this course number is to be used during the Winter Term. (★3)

**E E 609 PhD Research Project Definition**

□0.5 (fi 1) (either term, 0-1s-0). Preparation of a report defining the proposed PhD thesis research. (★0.5)

**E E 619 Microelectronics Process Technology**

□3 (fi 6) (either term, 3-0-0). The VLSI integrated circuit fabrication process. Overview of processing steps. Basic semiconductor physics. Silicon wafer material. Oxidation. Photolithography. Diffusion. Ion implantation. Chemical vapour deposition. Metallization. Process model. Yield, packaging, and assembly. (★3)

**E E 622 Power System Problems I**

□3 (fi 6) (first term, 3-0-0). Selected power system topics, such as stability, circuitbreaking, economic scheduling of generation, overvoltages, digital and analogue approaches to analysis. (★3)

**E E 623 Power System Problems II**

□3 (fi 6) (second term, 3-0-0). A continuation of E E 622, considering topics such as tie line control, excitation and its effect on the system. The application of control systems is emphasized. (★3)

**E E 624 Power Electronics and Motor Drives Lab**

□3.5 (fi 6) (second term, 0-1s-6). Laboratory testing of industrial drive systems; 3-phase diode rectifiers and harmonics, commutation overlap in 3-phase rectifiers, 3-phase full-wave SCR phase-controlled rectifier. DC drive variable-voltage square-wave inverter drive (VVI drive). PWM voltage source inverter drive (VSI PWM drive), soft-start, 12 pulse rectifier with delta-delta and delta-Y transformer. LabView data acquisition techniques, simulation of induction motor speed control. Pre/Corequisite: E E 531. This course is not open to students who have taken E E 513. (★3).

**E E 627 Advanced Power Quality**

□3 (fi 6) (either term, 3-0-0). Advanced power system harmonic fundamentals. Modelling transmission lines and cable systems, three phase transformers, synchronous generators, and motors, switched mode power supplies, variable speed drives, power system loads for harmonic studies. Designing and modelling utility and industrial power system network configurations. Impact of standards on design and design of mitigating actions to minimize harmonic distortion of voltage and current waveforms. Prerequisites: E E 521, 525, 529, 531, or consent of Department. (★3)

**E E 628 Radio Astronomy Techniques**

□3 (fi 6) (first term, 3-0-0). Radiometry; galactic background and sources; antennas and arrays as spatial frequency filters; aperture synthesis; earth-rotation synthesis; interferometry; correlation receivers. (★3)

**E E 631 Analogue Integrated Circuit Design**

□3.0 (fi 6) (either term, 3-0-0). Models for bipolar, JFET and MOS transistors; basic single transistor stages, cascode stage; differential stage with bipolar, JFET, MOS transistors, device mismatch, offset and drift; current sources for biasing; current sources as active loads; supply independent bias, voltage sources and voltage references; level shifters; input stages of operational amplifiers; output stages and protection circuits; monolithic operational amplifier, tutorial study and design example. (★3)

**E E 632 Design with Analogue Integrated Circuits**

□3.0 (fi 6) (second term, 3-0-0). Basic application of integrated operational amplifiers, inverting and noninverting modes, errors; difference and AC amplifiers, current sources; integration, differentiator, dynamic errors; sample and hold amplifiers; frequency compensation of operational amplifiers; comparators, limiters, waveform generators; multipliers, phaselock loops, design and applications; wideband amplifiers; noise in integrated circuits. (★3)

**E E 633 Design of CMOS Analog Integrated Circuits**

□3.0 (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. Prerequisite: E E 350. Corequisite: E E 458 or E E 462. (★3)

**E E 635 Advanced Digital Logic Design with Project**

□3.8 (fi 6) (either term, 3-0-3/2). Design and realization of synchronous and asynchronous sequential circuits, using VLSI devices. Note: this course may not be taken for credit if credit has already been obtained in E E 480. (★3)

**E E 641 High Vacuum Technology**

□3.8 (fi 6) (either term, 3-0-3/2). Gas kinetics; gas flow; pumping speed theory; pumping methods; pressure, measurement; vacuum system design; leak detection techniques; residual gas analysis; sorption processes. (★3)

**E E 642 Thin Film Technology**

□3 (fi 6) (second term, 3-0-0). Vacuum principles; thin film growth by sputtering, evaporation, and chemical techniques; characterization and classification of optical, electrical and mechanical properties; applications of thin films. (★3)

**E E 645 Laser Materials Processing**

□3 (fi 6) (either term, 3-0-0). An examination of common and widely used types of lasers, both low and high power, including Nd:YAG, carbon dioxide and excimer. Basic parameters, such as excitation, and optical extraction techniques utilized in the design and construction of practical laser devices will also be investigated. (★3)

**E E 651 Digital System Testing and Design for Testability**

□3 (fi 6) (second 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, built-in self-test, error detecting, and correcting codes in digital design and testing; CAD tools for design testability. (★3)

**E E 652 Semiconductor Memory Circuits and Architectures**

□3.5 (fi 6) (either term, 2-0-3). This course covers memory circuits and architectures of several families of semiconductor memories with emphasis on DRAM, and include SRAM, flash, and ferroelectric memories. Topics include SRAM, DRAM, flash, ferroelectric memories, sensing, decoding, speed-area-power trade-offs, redundancy, interfaces and novel applications. Coursework includes a focused literature review and a design project. Prerequisite: E E 653 or consent of Instructor. (★3)

**E E 653 Integrated Circuit Design**

□3 (fi 6) (either term, 3-0-0). Electrical characteristics of MOSFET devices and circuits. Simulation of MOSFET circuits. Integrated circuit fabrication. Design and layout of CMOS digital integrated circuits. Use of a computer layout system. Architecture of LSI and VLSI systems. Digital system timing and timing simulation. Computer aids for integrated circuit design. (★3)

**E E 654 SIMD Parallel Processor Architectures and Applications**

□3.5 (fi 6) (either term, 2-0-3). Several examples of Single Instruction stream, Multiple Data stream (SIMD) parallel processor architectures are described and analyzed in this course. Applications are examined. Course work includes a focused literature review and a parallel programming project. Prerequisite: consent of Instructor (background in computer architecture, and concurrent programming or operating systems recommended). (★3)

**E E 656 Statistical Communications**

□3 (fi 6) (either term, 3-0-0). Probability and stochastic processes; source coding for discrete and analog sources; representations and spectral analysis of digitally modulated signals; optimum receivers for the additive white Gaussian noise channel and their performance with different digital modulations; channel capacity and fundamentals of channel coding; multichannel and multicarrier systems. (★3)

**E E 660 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. Separation principle. The linear-quadratic control problem. (★3)

**E E 661 Adaptive Control Systems**

□3 (fi 6) (either term, 3-0-0). Review of necessary mathematical background. Identification structures and algorithms. Persistent excitation and parameter convergence. Adaptive control structures and algorithms. Stability and robustness issues in adaptive control. Applications of identification and adaptive control systems. (★3)

**E E 662 Digital Control Systems**

□3 (fi 6) (either term, 3-0-0). Analysis and design of digital 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. (★3)

**E E 663 Introduction to Robust Control**

□3 (fi 6) (either term, 3-0-0). Norms for signals and systems. Stability of feedback systems. Model uncertainty. Robust stability and robust performance. Coprime factorization and controller parameterization. Design constraints. The model matching problem. The Nevalinna-Pick interpolation. 2-norm minimization. (★3)

**E E 666 Nonlinear Control Systems**

□3 (fi 6) (either term, 3-0-0). Phase plane analysis. Lyapunov functions and stability in the sense of Lyapunov. Input-output stability. Passivity and small gain theorems. Robust control. Feedback linearization. Backstepping. (★3)

**E E 667 Selected Topics in Digital Signal Processing**

□3 (fi 6) (either term, 3-0-0). Intended to enable individual students to study special selected topics in digital signal processing under the supervision of a member of the Faculty. (★3)

**E E 668 Selected Topics in Robotics**

□3 (fi 6) (either term, 3-0-0). Intended to enable individual students to study special selected topics in robotics under the supervision of a member of the Faculty. (★3)

**E E 671 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. Pre/Corequisite: E E 571. (★3)

**E E 681 Survivable Networks**

□3 (fi 6) (either term, 2-2s-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. Prerequisites: E E 589 and 686. (★3)

**E E 682 Photonic Devices**

□3 (fi 6) (second term, 3-0-0). Overview of modern photonic devices for informatics. Photon emitters and detectors, optical waveguide devices; nonlinear optics in waveguides; electro- and acousto-optic devices; photonic integrated circuits; applications to switching signal processing, computing and sensing. Prerequisite: E E 586 or permission of Instructor. (★3)

**E E 683 Optical Fibre Communications**

□3 (fi 6) (first term, 3-0-0). Semiconductor laser structures; analysis of spectra, modulation characteristics and coupling. Fibre wave analysis, attenuation, dispersion, taps. Detector noise considerations and receiver circuit design. System options and design, coding. Heterodyning, electro-optical switching and recent developments. (★3)

**E E 685 Data Communication and Computer Networks**

□3 (fi 6) (second term, 3-0-0). Layered models for protocols. Point-to-point protocols. Delay models. Multiaccess systems. Routing. Flow control. (★3)

**E E 686 Digital Transmission Networks**

□3 (fi 6) (first term, 3-0-0). Plesiochronous (near synchronous) digital multiplexing, waiting time jitter, jitter tolerance, jitter accumulation, coherent and random regenerator jitter, lumped-word and distributed framing systems, misframe time,

SONET, network overhead functions, payload mapping, payload pointer concepts, network synchronization, TVAR calculation, wander and slips, protection switching, ring, mesh and selfhealing survivable networks, restorability and availability, asynchronous transfer mode, studies of specialized circuits, equipment design and recent research. Prerequisites: E E 588 and E E 589, or consent of Instructor. (★3)

#### E E 687 Transmission Media and Systems

□3 (fi 6) (either term, 3-0-0). Type of transmission media from twisted pairs, coaxial cables to free space propagation and loss. Types of fading and multipath fading analysis in communications systems, reliability and protection methods. Digital radio link analysis. Satellite communications, uplink and downlink analysis and multiple access techniques. Mobile and cellular radio systems from AMPS to Time Division Multiple Access and Code Division Multiple Access Systems. Calculations of cellular radio systems capacities and interferences. Coaxial cable TV systems from power feed to amplifiers, analysis and design. Field trips. Prerequisites: E E 390 or consent of Instructor. (★3)

#### E E 690 Concurrent Systems Engineering

□3 (fi 6) (either term, 3-0-0). Classification of concurrent systems. Modelling the system environment. Design methods. Concurrent programming environment and concepts. Petri nets. Concurrent software (Modula-2, Oberon, Occam, Ada). Timing requirements and scheduling algorithms. (★3)

#### E E 695 Plasma Devices and Diagnostics

□3 (fi 6) (second term, 3-0-0). Methods of obtaining plasmas: discharges, laser heating, shock tubes, etc. Plasma diagnostics including electric, magnetic and optical probing of plasmas. Prerequisite: consent of Instructor. (★3)

#### E E 900 Directed Research Project

★6 (fi 12) (variable, unassigned).

## 201.75 Emergency Medicine, EMER

Faculty of Medicine and Dentistry

### Undergraduate Courses

#### EMER 431 Emergency Medicine

★1 (fi 2) (first term, 19 hours). A general introduction to Emergency Medicine. For third year medical students only.

## 201.76 Engineering, Computer, ENCMP

Department of Computing Science  
Faculty of Engineering  
Faculty of Science

### Undergraduate Courses

#### ENCMP 100 Computer Programming for Engineers

□3.8 (fi 6) (either term, 3-0-1.5). Computer programming for solving engineering problems. Structured programming in Pascal. Use of subprogram libraries. Use of UNIX operating system on a computer workstation. (★3)

## 201.77 Engineering, General, ENGG

Faculty of Engineering

The following table lists renumbered courses effective 1993/94:

Old	New	Old	New
ENGG 200	ENGG 100	ENGG 500	ENGG 400
ENGG 201	ENGG 101	ENGG 502	ENGG 402
ENGG 230	ENGG 130	ENGG 504	ENGG 404
ENGG 300	ENGG 299	ENGG 505	ENGG 405
ENGG 308	ENGG 208	ENGG 506	ENGG 406

### Undergraduate Courses

#### ENGG 100 Orientation to the Engineering Profession I

□1 (fi 2) (first term, 1-0-0). A introduction to the Faculty and the engineering profession: the engineering disciplines, study skills, cooperative education, work opportunities, engineering, and society. Several written assignments will be required to assist in developing the student's communication skills. (★1)

#### ENGG 101 Orientation to the Engineering Profession II

□1 (fi 2) (second term, 1-0-0). An introduction to the engineering profession and its challenges; career fields, professional responsibilities of the engineer, ethics, the history and development of the engineering profession. Several written

assignments will be required to assist in developing the student's communication skills. (★1)

#### ENGG 130 Engineering Mechanics

□4 (fi 6) (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. (★3)

#### ENGG 208 Introductory Computer Aided Design

□3 (fi 6) (either term, 2-0-2). Introduction to microcomputers and microcomputer-aided drafting and design. Introduction to technical sketching for a variety of applications. Students registered in Business, Bachelor of Design, Bachelor of Fine Arts, or Bachelor of Arts with a major in Industrial Design or Visual Communications Design should enroll in ENGG 209. This course is not open to students registered in Engineering or Science. (★3)

#### ENGG 209 Intermediate Computer Aided Design

□3 (fi 6) (first term, 2-0-2). Introduction to microcomputers and microcomputer-aided drafting and design, with emphasis on advanced applications. Introduction to technical sketching for a variety of applications. This course is open to students registered in Business, Bachelor of Design, Bachelor of Fine Arts, and Bachelor of Design, Bachelor of Fine Arts, and Bachelor of Arts with a major in Industrial Design or Visual Communication Design, or with the Instructor's approval. This course is not open to students registered in Engineering or Science. (★3)

#### 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 Studies Program; self-assessment of transferable skills and work values; preparation of the resumé; practice of job interview skills; goal setting on the job; ethics, safety and human rights. 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. (★1)

#### 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. Note: Restricted to fourth-year regular and fifth-year co-op engineering students. (★1)

#### ENGG 402 Project Management and Entrepreneurship

□3 (fi 6) (either term, 3-0-0). The theory and practice of project management applied to the creation of new business activities and ventures. Intended to provide engineering and business students with an awareness of specific planning, budgeting and scheduling techniques which can be used to implement and monitor new business activities, especially those which require high ratios of capital investment per employee. Emphasis is placed on the importance of individual behavior and performance in starting new activities and attaining non-routine objectives. Comparisons of sole proprietorships and partnerships versus corporations, matrix versus line organizations, leadership and entrepreneurship versus administration. Introduction to finance, marketing and tax principles. Preparation of memos, letters, reports and management presentations to help communicate ideas to others. Prerequisites: consent of Instructor and completion of the second year of studies in an Engineering, Business, or Science program. (★3)

#### ENGG 404 Industrial 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. This course requires the payment of additional miscellaneous fees. See §22.2.3 for details. Prerequisite: Completion of at least two years of study in Engineering or Business or by consent of the Instructor. (★3)

#### ENGG 405 Engineering, Business and Society

□3 (fi 6) (either term, 3-0-0). An interpretative course on the art and science of engineering. The evolution of engineering. Examples and discussions of engineers' varied roles throughout business and society. Emphasis on engineers as 'problem solvers' who apply scientific principles and judgement to the creation and optimization of safe systems, and to the identification of those special systems which offer the best return on an investment of money, time and other resources. Attention is directed to major current and long-term business and societal problems in such areas as energy supply, population growth, man's impact on the environment, and Canada's technology and business status. Note: This course is intended for Business and Engineering students registered in their third or fourth year. Students from other faculties may be admitted on a space-available basis. (★3)

**ENGG 406 Industrial 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. This course requires the payment of additional miscellaneous fees. See §22.2.3 for details. Prerequisite: Completion of at least two years of study in Engineering or Business or by consent of the instructor. (★3)

**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 be granted for only one of ENGG 420 and B LAW 301. (★3)

**201.78 Engineering Management, ENG M**

Department of Mechanical Engineering  
Faculty of Engineering

The following table lists renumbered courses effective 1994/95:

Old	New	Old	New
MEC E 610	ENG M 620	MEC E 613	ENG M 650
MEC E 611	ENG M 630		

**Graduate Courses****ENG M 601 Graduate Seminar**

□0.5 (fi 2) (either term, 0-1s-0). Presentations by graduate students, staff, and visitors of issues and topics in Engineering Management. (★1)

**ENG M 620 Engineering Economic Analysis**

□3 (fi 6) (either term, 3-0-0). Advanced topics in engineering economics including: operating and capital budgets, financial statement use by managers, replacement analysis, cost of capital and leasing. Prerequisite: MEC E 310 or equivalent. (★3)

**ENG M 621 Engineering Economics Analysis I**

□1.5 (fi 3) (either term, 18 hours). Financial statements and their use. Review of basic financial analysis techniques, review of project evaluation, equivalence and rate of return analysis. Effects of depreciation. Capital Cost Allowance (CCA) and income tax on project evaluation. Prerequisite: MEC E 310. (★1.5)

**ENG M 622 Engineering Economics Analysis II**

□1.5 (fi 3) (either term, 18 hours). Estimating and costing, capital budgeting and cost of capital multiple investment alternative, risk assessment and risk management, inflation and its effects on cash flows, alternative methods of project finance (venture capital, long term debt, initial public offerings, etc.), and cost-benefit analysis. Prerequisite: ENG M 621. (★1.5)

**ENG M 630 Project Management Techniques**

□3 (fi 6) (either term, 3-0-0). This course involves study of the management techniques that are particularly relevant to the design, development and control of engineering projects. Special attention will be given to network (CPM, PERT) systems and the use of computers for time and cost control. (★3)

**ENG M 650 Managing in a Technical Environment**

□3 (fi 6) (either term, 3-0-0). Design concepts for management systems, philosophy of engineering management, the management function, matrix management, management by objectives. (★3)

**ENG M 670 Advanced Topics in Engineering Management I**

□3 (fi 6) (either term, 3-0-0). (★3)

**ENG M 680 Advanced Topics in Engineering Management II**

□3 (fi 6) (either term, 3-0-0). (★3)

**201.79 Engineering Physics, EN PH**

Department of Physics  
Faculties of 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. (★3)

**201.80 English, ENGL**

Department of English  
Faculty of Arts

**Note:** Courses in the Department of English teach the English language and its several literatures; some works may be taught in translation as necessary to fulfil the primary goal of understanding English literature.

See also WRITE (§201.241).

**Undergraduate Courses****Notes**

- (1) Most students will take ENGL 100 or 101, two term courses, either of which will serve as the prerequisite to all senior English courses. Students with credit in ENGL 100 or 101 or equivalent should not take current ENGL 100 or 101 and may proceed to senior English courses. Transfer students to the Faculty of Arts who have received credit in ★3 in junior-level English are permitted to take either ENGL 104 or 105 in lieu of the ENGL 100/101 requirement.
- (2) Normally, no more than one two term, junior English course, or equivalent, maybe offered for credit in an undergraduate program.
- (3) Junior English courses require a substantial amount of writing in essays and tests to afford practice in setting down ideas in good English.
- (4) All senior courses have as prerequisite ENGL 100, 101 or equivalent; prerequisites for 400-level courses are ★12 of senior English, ★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) Not all senior courses are offered in any given year.

**ENGL 100 Literature in English, Beginnings to the Present**

★6 (fi 12) (two term, 3-0-0). A close study of historically representative works which demonstrate the development, enlargement, and experimentalism of literature in English, with a minimum 20% of class time devoted to writing instruction. Not to be taken by students with credit in former ENGL 100 or 101 or 110 or 104/105.

**ENGL 101 Critical Reading and Writing**

★6 (fi 12) (two term, 3-0-0). A critical study of literature in English, concentrating on works written since 1800, with a minimum 30% of class time devoted to writing instruction. Note: Not to be taken by students with credit in ENGL 100 or 110 or in 104/105.

**ENGL 104 Readings in Poetry**

★3 (fi 6) (either term, 3-0-0). A close study of selected modern and traditional works to introduce the student to ways of approaching and critically evaluating poetry. Note: Not for degree credit to students enrolled in the BA degree program.

**ENGL 105 Readings in Prose**

★3 (fi 6) (either term, 3-0-0). A close study of novels, short stories, essays, and other forms, both modern and traditional, to introduce the student to ways of approaching prose, and to assist the student in reading critically. Note: Not for degree credit to students enrolled in the BA degree program.

**ENGL 108 Introduction to Language and Literature**

★3 (fi 6) (first term, 3-0-0). This course combines formal instruction in writing with the 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 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.

**Note:** All senior courses have as a prerequisite ENGL 100, 101 or equivalent.

**ENGL 201 Literature in English, Beginnings to 1800**

★6 (fi 12) (two term, 3-0-0). A close study of representative works which demonstrate the development of the English literary tradition to 1800. Prerequisite: ENGL 101. Not to be taken by students with credit in ENGL 100.

**ENGL 204 Traditions in English Poetry**

★6 (fi 12) (two term, 3-0-0). The traditions, forms, and techniques of English poetry.

**ENGL 205 The English Novel**

★6 (fi 12) (two term, 3-0-0). Representative works by Defoe, Richardson, Fielding, Smollett, Sterne, Austen, Scott, Dickens, Thackeray, Brontë, Hardy, and others. Not to be taken by students with credit in former ENGL 305.

**ENGL 206 The Short Story**

★3 (fi 6) (either term, 3-0-0). Representative works of writers illustrating the tradition of the short story in English.

**ENGL 207 Native Literatures**

★3 (*fi 6*) (either term, 3-0-0). Introduction to Native North American Literatures, which may include fiction, drama, poetry and non-fiction in Canada and the USA.

**ENGL 212 Introduction to the English Language**

★3 (*fi 6*) (either term, 3-0-0). This course introduces the grammar of English sounds, words, and sentences as a basis for further studies in language and literature. Note: Not to be taken by students with credit in former ENGL 288 or 313, or in LING 101 or 203.

**ENGL 216 Literary Theory**

★6 (*fi 12*) (two term, 3-0-0). An introduction to a variety of primarily 20th-century theoretical practices in the context of their history and development, with the aim of enhancing an understanding of literature and literary culture.

**ENGL 239 Shakespeare**

★3 (*fi 6*) (either term, 3-0-0). A reading of nine plays, representing the range of Shakespeare's work. Note: Not to be taken by students with credit in ENGL 338.

**ENGL 271 Canadian Literature: Major Writers and Movements**

★6 (*fi 12*) (two term, 3-0-0). A study of the growth of English-Canadian literature in its cultural context from the colonial period to the present, with an emphasis on major writers and movements. Note: Not open to students with credit in ENGL 371, Canadian Literature to 1925, or ENGL 372 Canadian Literature from 1925.

**ENGL 281 Post-Colonial Literature**

★6 (*fi 12*) (two term, 3-0-0). Representative works of writers from various areas of the Commonwealth. Note: Not to be taken by students with credit in former ENGL 380.

**ENGL 283 An Introduction to the Literature of Popular Culture in English**

★3 (*fi 6*) (either term, 3-0-0). A study of the varieties of literature, written and spoken, of popular culture in English.

**ENGL 285 The King James Bible in English Literature**

★6 (*fi 12*) (two term, 3-0-0). A literary study of selections from the Hebrew Bible (Old Testament) and New Testament of the King James Bible, and of the influence of the King James Bible in English literature. Not to be taken by students with credit in former ENGL 385.

**ENGL 287 Children's Literature in English**

★6 (*fi 12*) (two term, 3-0-0). An historical and critical study of children's literature in English. It includes books written especially for children and books annexed from English literature by children.

**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, will emphasize the study of grammar, punctuation, and sentence and paragraph structure. The study of models of prose style will be 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 ENGL 298.

**ENGL 310 Introduction to Bibliography and Methods of Research**

★3 (*fi 6*) (either term, 3-0-0). An examination of the development of printing, textual problems, library organization, bibliography compilation, and manuscript styles and methods.

**ENGL 311 History of the Language**

★3 (*fi 6*) (either term, 3-0-0). An analysis of the historical development of the English language, with some study in the prose tradition.

**ENGL 320 Old English Language and Literature**

★6 (*fi 12*) (two term, 3-0-0). An introduction to the language and literature of Anglo-Saxon England.

**ENGL 321 The Earlier Middle Ages**

★3 (*fi 6*) (either term, 3-0-0). The literature of England from its beginnings to the end of the 13th century.

**ENGL 322 The Later Middle Ages**

★3 (*fi 6*) (either term, 3-0-0). The literature of 14th- and 15th-century England, including Chaucer.

**ENGL 323 Middle English Literature**

★6 (*fi 12*) (two term, 3-0-0). Middle English literature excluding Chaucer. Works will be read in the original language. Note: Not to be taken by students with credit in ENGL 321 or 322.

**ENGL 324 Chaucer**

★6 (*fi 12*) (two term, 3-0-0). Major works of Chaucer and of selected poets of the 15th century.

**ENGL 327 Medieval and Tudor Drama**

★3 (*fi 6*) (either term, 3-0-0). English drama to the death of Marlowe.

**ENGL 330 The Short Poem in the Renaissance**

★3 (*fi 6*) (either term, 3-0-0). This course will include a study of lyrics and the sonnet.

**ENGL 331 The Romance Tradition in Renaissance Literature**

★3 (*fi 6*) (either term, 3-0-0). To include Utopia, Arcadia, and The Faerie Queene.

**ENGL 337 Elizabethan and Jacobean Drama**

★3 (*fi 6*) (either term, 3-0-0). English drama from 1590 to 1642.

**ENGL 338 Shakespeare**

★6 (*fi 12*) (two term, 3-0-0). A study of representative plays. Note: Not to be taken by students with credit in ENGL 239 or 339.

**ENGL 339 Further Studies in Shakespeare**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ENGL 239 or consent of Department. Note: Not to be taken by students with credit in ENGL 338.

**ENGL 340 Milton and the 17th Century**

★6 (*fi 12*) (two term, 3-0-0). Note: Not to be taken by students with credit in ENGL 344.

**ENGL 341 The Augustan Age**

★3 (*fi 6*) (either term, 3-0-0). Representative works by writers from the Restoration and early 18th century.

**ENGL 343 The Age of Sensibility**

★3 (*fi 6*) (either term, 3-0-0). Works of representative writers of the later 18th-century, including the precursors of Romanticism.

**ENGL 344 Milton**

★3 (*fi 6*) (either term, 3-0-0). A study of representative poems. Note: Not to be taken by students with credit in ENGL 340.

**ENGL 345 English Prose 1660-1800**

★3 (*fi 6*) (either term, 3-0-0). Representative non-fiction works by various men and women writers, including letters, essays, historiography, science and philosophy, biography and autobiography, and political controversy.

**ENGL 346 Jonson, Donne, and their Successors**

★3 (*fi 6*) (either term, 3-0-0). Formerly ENGL 332.

**ENGL 347 Restoration and 18th-Century Drama**

★3 (*fi 6*) (either term, 3-0-0). English drama from 1660 to 1780. Note: Not to be taken by students with credit in former ENGL 355, Drama from the Restoration to 1870.

**ENGL 350 British Romantic Poetry**

★3 (*fi 6*) (either term, 3-0-0). Representative poems of the Romantic period. Note: Not to be taken by students with credit in ENGL 351.

**ENGL 351 Poetry and Prose of the Romantic Period**

★6 (*fi 12*) (two term, 3-0-0). Readings in representative Romantic texts. Note: Not to be taken by students with credit in ENGL 350.

**ENGL 352 The Earlier Victorian Age**

★6 (*fi 12*) (two term, 3-0-0). Representative works of the earlier Victorians.

**ENGL 353 The Later Victorian Age**

★3 (*fi 6*) (either term, 3-0-0). Representative works of the later Victorians.

**ENGL 357 19th-Century Drama**

★3 (*fi 6*) (either term, 3-0-0). Drama in English from Romanticism to Naturalism. Note: Not to be taken by students with credit in former ENGL 355, Drama from the Restoration to 1870.

**ENGL 358 American Literature to 1900**

★6 (*fi 12*) (two term, 3-0-0). A selection of representative major writers. Emphasis on the writers of the 'American Renaissance,' especially Poe, Hawthorne, Emerson, Thoreau, Melville, Whitman, Mark Twain, and Henry James. Note: Not to be taken by students with credit in former ENGL 358 or ENGL 359.

**ENGL 359 American Prose to 1900**

★3 (*fi 6*) (either term, 3-0-0). Representative works. Note: Not to be taken by students with credit in ENGL 358.

**ENGL 360 Twentieth-Century American Literature**

★6 (*fi 12*) (two term, 3-0-0). A selection of representative major writers. Note: Not to be taken by students with credit in ENGL 361 or 363.

**ENGL 361 American Literature from 1900-1945**

★3 (*fi 6*) (either term, 3-0-0). Representative works of 20th-century American writers to mid-century. Note: Not to be taken by students with credit in ENGL 360.

**ENGL 362 American Literature from 1945**

★3 (*fi 6*) (either term, 3-0-0). Representative works of 20th-century American writers from mid-century to the present. Note: Not to be taken by students with credit in ENGL 360.

**ENGL 363 Early 20th-Century Poetry**

★3 (*fi 6*) (either term, 3-0-0). Representative works of British and American poets to mid-century. Note: Not to be taken by students with credit in ENGL 360 or 370.

**ENGL 364 Later 20th-Century Poetry**

★3 (*fi 6*) (either term, 3-0-0). Representative works of British and American poetry from mid-century to the present.



**ENGL 365 Early 20th-Century British Novel**

★3 (fi 6) (either term, 3-0-0). Representative works of 20th-Century British novelists to mid-century. Note: Not to be taken by students with credit in ENGL 370.

**ENGL 366 British Literature from 1945**

★3 (fi 6) (either term, 3-0-0). Representative works of 20th-century British writers from mid-century to the present.

**ENGL 368 Early 20th-Century Drama**

★3 (fi 6) (either term, 3-0-0). Selected British and American plays, from Naturalism to the Theatre of the Absurd. Note: Not to be taken by students with credit in ENGL 367.

**ENGL 369 Later 20th-Century Drama**

★3 (fi 6) (either term, 3-0-0). Selected plays of British and American dramatists from mid-century to the present. Formerly ENGL 468.

**ENGL 370 The Age of Modernism**

★6 (fi 12) (two term, 3-0-0). Note: Not to be taken by students with credit in ENGL 363 or 365. Formerly ENGL 369.

**ENGL 371 Canadian Literature to 1925**

★6 (fi 12) (two term, 3-0-0). A critical and historical study of the literature of English-speaking Canada to 1925. Not to be taken by students with credit in former ENGL 384, in ENGL 373, 375, or in both former ENGL 386 and 387.

**ENGL 372 Canadian Literature from 1925**

★6 (fi 12) (two term, 3-0-0). A critical and historical study of the literature of English-speaking Canada from 1925 to the present. Not to be taken by students with credit in former ENGL 384, in ENGL 374, 376, or in both former ENGL 386 and 387.

**ENGL 373 Canadian Literature to 1925**

★3 (fi 6) (either term, 3-0-0). A critical and historical study of the literature of English-speaking Canada to 1925. Not to be taken by students with credit in ENGL 371, or former 375, 384, 387.

**ENGL 374 Canadian Literature 1925-1960**

★3 (fi 6) (either term, 3-0-0). A critical and historical study of representative Canadian writing in English. Not to be taken by students with credit in ENGL 372, or former ENGL 384, or former ENGL 387.

**ENGL 376 Canadian Literature from 1960**

★3 (fi 6) (either term, 3-0-0). A critical and historical study of representative Canadian writing in English from 1960. Not to be taken by students with credit in ENGL 372, or former ENGL 384, or former ENGL 386.

**ENGL 377 Modern Canadian Drama**

★3 (fi 6) (either term, 3-0-0). Selected plays by dramatists of English-speaking Canada.

**ENGL 381 Post-Colonial Literature: National Literatures**

★3 (fi 6) (either term, 3-0-0). Note: Not to be taken by students with credit in former ENGL 480.

**ENGL 383 History of the Literature of Popular Culture in English**

★3 (fi 6) (either term, 3-0-0). An historical survey of representative works in the literature, written and spoken, of popular culture in English.

**ENGL 388 Folklore in Children's Literature in English**

★3 (fi 6) (either term, 3-0-0). An examination of the related fields of folklore and fantasy in children's literature in English. It deals with those elements of folklore, mythology and legend that have become a traditional part of children's literature and also includes certain modern adaptations and fantasies which have their origins in myth and folklore.

**ENGL 389 Classics of Children's Literature in English**

★3 (fi 6) (either term, 3-0-0). A representative sampling of classics of children's literature in English. As an historical survey it will examine prevailing and changing attitudes towards children to provide a critical assessment of the ways in which various authors have succeeded in understanding and pleasing a particular audience.

**ENGL 390 Writing by Women I**

★6 (fi 12) (two term, 3-0-0). A survey of women's writing in English from the earliest period to the mid-19th century. Note: Not to be taken by students with credit in former ENGL 390/395 Women's Literary Tradition.

**ENGL 391 Writing by Women II**

★6 (fi 12) (two term, 3-0-0). A survey of women's writing in English from the mid-19th century to the present. Note: Not to be taken by students with credit in former ENGL 390/395 Women's Literary Tradition.

**ENGL 401 Studies in Authors**

★3 (fi 6) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 402 Studies in Genres**

★3 (fi 6) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 403 Studies in Literary Themes**

★3 (fi 6) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 404 Studies in Literary History**

★3 (fi 6) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 413 Studies in English Language**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ENGL 311, or consent of Department. Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 417 Literary Theory: Studies in Rhetorical Modes**

★3 (fi 6) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 420 Studies in Old English Literature and Language**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ENGL 320, or consent of Department. Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 423 Studies in Middle English Literature**

★3 (fi 6) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 434 Studies in 16th- and Early 17th-Century Poetry**

★3 (fi 6) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 435 Studies in 16th- and Early 17th-Century Prose**

★3 (fi 6) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 437 Studies in Renaissance Drama**

★3 (fi 6) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 444 Studies in Restoration and 18th-Century Poetry**

★3 (fi 6) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 445 Studies in Restoration and 18th-Century Prose**

★3 (fi 6) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 450 Studies in Romantic Literature**

★3 (fi 6) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 454 Studies in 19th- and/or 20th-Century Poetry**

★3 (fi 6) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 455 Studies in 19th- and/or 20th-Century Prose**

★3 (fi 6) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 456 Dickens**

★3 (fi 6) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 460 Studies in American Authors**

★3 (fi 6) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 461 Studies in American Literary Movements**

★3 (fi 6) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 465 National Literary Movements of the British Isles, Excluding England**

★3 (fi 6) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 474 Studies in Canadian Poetry**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★6 in Canadian Literature or consent of Department. Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 475 Studies in Canadian Prose**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★6 in Canadian Literature, or consent of Department. Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 477 Studies in Canadian Drama**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★6 in Canadian Literature; or consent of Department. Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 478 Regional Literature of Canada: Prairie Literature**

★3 (fi 6) (either term, 3-0-0). Literature of the prairie provinces, to be examined primarily as a body of related texts with a place in national and international literary developments, but also in relation to the geographical, historical, and cultural distinctiveness of the region and to changing conceptions of regionalism in Canadian literature. Prerequisite: ★6 in Canadian literature; or consent of Department. Note: Not open to students with credit in former ENGL 470, Regional Literature of Canada dealing with the prairie provinces. Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 479 Regional Literature of Canada: Other Regions**

★3 (fi 6) (either term, 3-0-0). Representative works of writers of English-speaking Canada, excluding the prairie provinces. Note: Not open to students with credit

in former ENGL 470, Regional Literature of Canada dealing with the non-prairie provinces. Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 481 Post-Colonial Literature: Comparative Studies**

★3 (*fi 6*) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 483 Studies in the Literature of Popular Culture in English**

★3 (*fi 6*) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 484 Studies in Literature and Film**

★3 (*fi 6*) (either term, 3-0-0). A cross-disciplinary study of selected literary and film texts in English. Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 485 Biblical Topics in English Literature**

★3 (*fi 6*) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 487 Further Studies in Children's Literature**

★3 (*fi 6*) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 490 Women's Genres**

★3 (*fi 6*) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 491 Women's Modernism**

★3 (*fi 6*) (either term, 3-0-0). Note: Please refer to Note (4) at the beginning of this listing.

**ENGL 532 Tutorial: Fourth-Year Honors English**

★3-6 (*variable*) (variable, variable). In the third year of the program, the Honors student, in consultation with the Department, will arrange for a literary project to be pursued under the guidance of a member of the Department for the ensuing summer and one term. The project will involve 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 560 Bibliography and Methods of Research**

★0 (*fi 2*) (two term, 1-0-0).

**ENGL 567 Studies in Literary History**

★3 (*fi 6*) (either term, 3-0-0).

**ENGL 571 Critical Theory**

★6 (*fi 12*) (two term, 3-0-0). Not to be taken by students with credit in ENGL 568.

**ENGL 584 Creative Writing**

★6 (*fi 12*) (two term, 3-0-0).

**ENGL 586 Studies in American Literature**

★3 (*fi 6*) (either term, 3-0-0).

**ENGL 590 Canadian Literature**

★6 (*fi 12*) (two term, 3-0-0).

**ENGL 591 Studies in Canadian Literature**

★3 (*fi 6*) (either term, 3-0-0).

**ENGL 614 Middle English Literature**

★6 (*fi 12*) (two term, 3-0-0).

**ENGL 615 Studies in Middle-English Literature**

★3 (*fi 6*) (either term, 3-0-0).

**ENGL 616 Chaucer**

★6 (*fi 12*) (two term, 3-0-0).

**ENGL 634 Renaissance Literature**

★6 (*fi 12*) (two 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 660 The 18th-Century Novel**

★6 (*fi 12*) (two term, 3-0-0).

**ENGL 663 Romantic Literature**

★6 (*fi 12*) (two term, 3-0-0).

**ENGL 665 Studies in Romantic Literature**

★3 (*fi 6*) (either term, 3-0-0).

**ENGL 671 Victorian Poetry**

★6 (*fi 12*) (two term, 3-0-0).

**ENGL 672 The Victorian Novel**

★6 (*fi 12*) (two term, 3-0-0).

**ENGL 673 Studies in Victorian Literature**

★3 (*fi 6*) (either term, 3-0-0).

**ENGL 674 Post-Colonial Literature in English**

★6 (*fi 12*) (two term, 3-0-0).

**ENGL 676 The 20th-Century Novel**

★6 (*fi 12*) (two 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 684 20th-Century Drama**

★6 (*fi 12*) (two term, 3-0-0).

**ENGL 687 Studies in Children's Literature**

★3 (*fi 6*) (either term, 3-0-0).

**ENGL 690 Women Writers in English**

★6 (*fi 12*) (two term, 3-0-0).

**ENGL 692 Technique of the Novel**

★6 (*fi 12*) (two 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 900 Directed Research Project**

★3 (*fi 6*) (variable, unassigned).

## 201.81 English as a Second Language, ESL

Faculty of Extension

### Undergraduate Courses

**ESL 150 Preparing for Undergraduate Studies**

★6 (*fi 15*) (either term, 6-0-0). This course enables international students whose first language is other than English to develop the academic and social communication skills necessary to function effectively and independently at the undergraduate level at the University of Alberta. In addition to a 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 also serves as the English language component in the University of Alberta Visiting Student Certificate Program. Prerequisites: Minimum score of 530 on TOEFL or appropriate cut-off scores for other standardized academic proficiency tests recognized by the Office of the Registrar and Student Awards. Schedule: April-July 1997 for the University of Alberta Visiting Student Certificate Program; August-November 1997 for January entrance to University degree programs.

**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. Schedule: April-July or August-November.

## 201.82 Enseignement pratique, ENPRQ

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

#### 201.82.1 Stage I élémentaire/secondaire

##### ENPRQ 300 Enseignement pratique: niveau élémentaire

★6 (fi 13) (l'un ou l'autre semestre, 6 weeks). Stage pratique de 6 semaines dans un milieu scolaire (immersion française ou français en milieu minoritaire). Prérequis: EDUC 200 ou l'équivalent et une note de 6 ou plus dans le test d'admission aux stages.

##### ENPRQ 310 Enseignement pratique: niveau secondaire

★6 (fi 13) (l'un ou l'autre semestre, 6 weeks). Stage pratique de 6 semaines dans un milieu scolaire (immersion française ou français en milieu minoritaire). Prérequis: EDUC 200 ou l'équivalent et une note de 6 ou plus dans le test d'admission aux stages.

#### 201.82.2 Stage II élémentaire/secondaire

##### ENPRQ 350 Enseignement pratique: niveau élémentaire

★6 (fi 13) (l'un ou l'autre semestre, 6 weeks). Stage pratique de 6 semaines dans un milieu scolaire (immersion française ou français en milieu minoritaire). Prérequis: Stage I.

##### ENPRQ 360 Enseignement pratique: niveau secondaire

★6 (fi 13) (l'un ou l'autre semestre, 6 weeks). Stage pratique de 6 semaines dans un milieu scolaire (immersion française ou français en milieu minoritaire). Prérequis: Stage I.

#### 201.82.3 Stage III

##### ENPRQ 400 Etude approfondie: niveau élémentaire

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0).

## 201.83 Entomologie, ENTIE

Faculté Saint-Jean

### Cours de 1er cycle

##### ENTIE 120 Introduction à la biologie des insectes

★3 (fi 6) (l'un ou l'autre semestre, 3-0-3). Introduction à la structure, à la fonction, à l'écologie et à la systématique des insectes, l'accent étant mis sur la régulation de leur métabolisme, de leur locomotion, de leur reproduction et de leur développement. Etude de l'évolution des ordres des insectes et de leurs interactions avec les autres organismes, y compris l'homme. Prérequis: Biologie 30 ou l'accord du Vice-doyen aux affaires académiques. Anciennement ENTIE 220.

## 201.84 Entomology (Biological Sciences), ENT

Department of Biological Sciences  
Faculty of Science

**Note:** See the following sections for listings of other Biological Sciences courses: Biology (BIOL); Botany (BOT); Genetic (GENET); Microbiology (MICRB); Zoology (ZOO).

### Undergraduate Courses

##### ENT 207 Agricultural Entomology

★3 (fi 6) (first 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.

##### ENT 220 Insect Diversity

★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.

##### ENT 280 Forest Entomology

★3 (fi 6) (second term, 3-0-3). Characteristics of major North American forest

insects. Roles of insects in forest ecosystems. Insects destructive to wood and wood products. Principles of control. Prerequisites: Biology 30 and first year Chemistry (CHEM 161 and 163 recommended). Not open to first-year students.

##### ENT 321 Insect Function

★3 (fi 6) (second term, 3-1s-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, use of insect models for general physiological and biochemical research, and adaptations underlying insecticide resistance. Seminars are discussions of recent literature. Prerequisite: ENT 220.

##### 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.

##### ENT 392 Medical and Veterinary Entomology

★3 (fi 6) (second term, 3-0-3). 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: ENT 207 or 220 and ZOOL 250. Not open to students with credit in ENT 292.

### Graduate Courses

#### Notes

- (1) All 300- and 400-level courses in the Department of Biological Sciences may be taken for credit 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, 540, 541, 550, 555, 560; CHEM 361, 363, 461; CELL 300, 301; INT D 371, 372, 421, 452, 455, 464, 543, 544, 545, 551; MA SC 400, 401, 402, 410, 412, 420, 425, 430, 437, 440, 445, 450, 454, 470, 480; MMI 350, 405, 415, 516, 520; NEURO 472, 503; NU FS 363; PALEO 318, 319; PHARM 601.

##### ENT 521 Arthropod Physiology

★3 (fi 6) (first term, 3-0-0). Lectures and discussions of assigned readings in arthropod physiology. The topics will change from year to year, and the course may be taken for credit more than once. Prerequisite: Consent of Department.

##### ENT 601 Seminar

★3 (fi 6) (first term, 0-2s-0).

##### ENT 602 Seminar

★3 (fi 6) (second term, 0-2s-0).

## 201.85 Environmental and Conservation Sciences, ENCS

Departments of Agricultural, Food and Nutritional Science; Biological Sciences; Renewable Resources; and Rural Economy  
Faculties of Agriculture, Forestry, and Home Economics; and Science

**Note:** See also Agricultural Economics (AG EC), 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 table lists renumbered courses effective 1995/96:

Old	New	Old	New
AN SC 376	ENCS 376	PL SC 406	ENCS 406
ENCS 202	SOILS 210	PL SC 407	ENCS 407
FOR 365	ENCS 201	PL SC 471	ENCS 471
PL SC 356	ENCS 356		

The following course was renumbered effective 1996/97:

Old	New
ENCS 485	REN R 485

### Undergraduate Courses

##### ENCS 201 Wildlife Biodiversity and Ecology

★3 (fi 6) (second term, 3-0-3). Survey of wildlife ecosystems with fishes, amphibians, reptiles, birds, mammals, and selected invertebrates. Emphasis on field identification, voice recognition, adaptive ecology, and habitat relationships. Current conservation and stewardship issues stressed. Field trip. This course requires payment of additional miscellaneous fees (see §22.2.3). Prerequisite: ★3 in university-level Biology. Credit may not be obtained in both ENCS 201 and FOR 365. [Renewable Resources]

**ENCS 203 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. [Renewable Resources]

**ENCS 204 Introduction to Plant Resources**

★3 (fi 6) (first term, 3-0-3). Identification of vascular and non-vascular plants (including some fungi) and quantitative assessment of vegetation. Includes population and community sampling techniques, community classification, assessment of diversity, and quantification of range and timber resources. Credit cannot be obtained for both ENCS 204 and BOT 204. Prerequisite: BIOL 108 or BOT 199. [Biological Sciences and Renewable Resources]

**ENCS 260 History and Fundamentals of Environmental Protection and Conservation**

★3 (fi 6) (second term, 3-0-0). History, philosophy, and modern relationship of man and wildland environments; origins and ethics of conservation and preservation; natural parks movement; current perspectives concerning parks, protected areas, bioethics, recreational trends, and global perspectives. Credit cannot be obtained for both ENCS 260 and FOR 260. [Renewable Resources]

**ENCS 352 Natural Resource and Environmental Law**

★3 (fi 6) (either 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 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, 3-3s-0). Erosion and civilization, a historical perspective. Principles of water and wind erosion. Effects of erosion on land productivity and on water and air quality. Biophysical, economical, and social factors contributing to erosion. Principles of erosion control on arable and non-arable land; planning of land-use, biological, and engineering practices. Hands-on experience with erosion and productivity computer models. Prerequisite: SOILS 210 or ENCS 202. Credit cannot be obtained for both ENCS 360 and SOILS 360. [Renewable Resources]

**ENCS 361 Climates and Ecosystems**

★3 (fi 6) (first term, 3-2s-0). 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. Prerequisites: SOILS 210. Recommended courses: one of PL SC 221, 225, BIOL 208 or BOT 199. [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 BIOL 467. This course has limited enrollment, with preference given to students in the ENCS, Conservation Biology and Management Program. [Renewable Resources]

**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. [Renewable Resources]

**ENCS 401 Special Topics in Conservation**

★3 (fi 6) (either term, 0-3s-0). Individual Study. Problems in specialized areas of conservation science. Open to third- or fourth-year students upon consent of Instructor. [Renewable Resources]

**ENCS 402 Special Topics in Environmental Sciences**

★3 (fi 6) (either term, 0-3s-0). Individual Study. Problems in specialized areas of environmental science. Open to third- or fourth-year students upon consent of Instructor. [Renewable Resources]

**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. Prerequisite: one of ENCS 356, PL SC 356, FOR 120, REN R 120 or BOT 210; ENCS 356 is strongly recommended. [Agricultural, Food and Nutritional Science]

**ENCS 407 Rangeland Plant Communities of North America**

★3 (fi 6) (first term, 1-0-6). An in-depth study of the plants and communities of North American rangelands and wildland ecosystems, and their management. Prerequisites: ENCS 356 or PL SC 356; ENCS 406 or PL SC 406 strongly recommended. [Agricultural, Food and Nutritional Science]

**ENCS 410 Environmental Impact Assessment**

★3 (fi 6) (second term, 0-3s-0). The background and needs for environment impact assessment (EIA); evolution of requirements in Alberta, Canada, and elsewhere; federal and provincial jurisdiction; current and evolving regulatory framework; integration of EIA into the planning and decision-making process; resource, environmental quality, and social issues; EIA conduct and delivery; project implementation in response to EIA findings; case studies. Prerequisites: Open only to fourth-year students in the Environmental and Conservation Sciences Program, or consent of Instructor. Credit cannot be obtained for both CAPS 410 and ENCS 410. (Offered jointly by the Departments of Renewable Resources and Rural Economy.) [Rural Economy]

**ENCS 440 Solute and Contaminant Transport in Unsaturated Soils**

★3 (fi 6) (second term, 3-0-3). Introduction to physical principles governing the movement of water and solutes in unsaturated soils. Formulation of transport processes by applying fundamental principles. Interactions between water and solute movement. Effects of soil temperature. Introduction to concepts and approaches in modelling the movement and fate of solutes in soils. Examples from areas of waste management and soil remediation will be used throughout the course. Prerequisites: An introductory calculus course plus 10 full-course equivalents of university biological, physical and/or life science courses. [Renewable Resources]

**ENCS 445 Spatial Variability in Natural Landscapes**

★3 (fi 6) (second term, 3-0-3). Concepts of spatial variability and its mathematical characterization. Introduction to geostatistical methods, the maximum-likelihood method, and their applications in environmental assessment and land resource management. Sampling, data interpretation, and integration of sample information over larger areas. Prerequisites: An introductory statistics course plus 10 full-course equivalents of university biological, physical and/or life science courses. [Renewable Resources]

**ENCS 455 Soil Remediation**

★3 (fi 6) (first term, 3-2s-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. Prerequisite: Must have completed at least ★75 at university with emphasis on biophysical courses. [Renewable Resources]

**ENCS 462 Protected Areas Management**

★3 (fi 6) (first term, 3-0-0). Principles and methods of management of national and provincial parks, and forest recreational systems; wilderness management; the integration of biological and sociological criteria in park and recreational management. Field trip. Course requires payment of additional miscellaneous fees (see §22.2.3). Prerequisite: ENCS 260. [Renewable Resources]

**ENCS 463 Protected Areas Planning**

★3 (fi 6) (second term, 3-0-0). Survey of current principles and practices relevant to the planning of parks, wilderness areas, and recreational environments in wildland settings, from the perspective of the practitioner. Emphasis on current case studies, including possible field trip. This course requires the payment of additional miscellaneous fees. See §22.2.3 for details. Prerequisite: ENCS 260 or ENCS 462. [Renewable Resources]

**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]

**ENCS 465 Environmental and Conservation Field Studies**

★3 (fi 6) (either term, 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. [Renewable Resources]

**ENCS 467 Methods of Environmental Interpretation and Communication**

★3 (fi 6) (second term, 3-0-0). Application of principles of public communication and interpretation to environmental settings. Planning and design of public programs, nature trails, signs, exhibits, visitor centres, conducting walks, and presentations. Environmental education, program evaluation. Public relations and media interaction. Prerequisite: consent of Instructor. ENCS 260 recommended. [Renewable Resources]

**ENCS 468 Fundamentals of Environmental Advocacy**

★3 (fi 6) (first term, 3-0-0). History, theory and modern practice of environmental advocacy in defence of biodiversity and ecosystem integrity. Promotes professionalism and advance skills in leadership, organization, and applied biological and social sciences. Stresses ethics, case studies, role models, research and preparation of arguments, conflict resolution, media communications and individual empowerment. Guest speakers. Fields trips. Prerequisite: ★90 in university-level coursework. [Renewable Resources]

**ENCS 471 Practical Case Studies in Rangeland Management and Conservation**

★3 (fi 6) (first term, 3-0-3). Effects of fire, grazing, browsing, and mechanical improvement practices on the productivity and species diversity of rangeland ecosystems. Rangeland conservation, management, and wildlife habitat improvement. Field trips. Offered in alternate years commencing 1995/96. Prerequisite: ENCS 356 or PL SC 356; ENCS 406 or PL SC 406 is strongly recommended. [Agricultural, Food and Nutritional Science]

**ENCS 472 Human Factors in Wildland Resource Management**

★3 (fi 6) (first term, 3-0-0). Overview of the relationship between people, as individuals or groups, and their interface with the environment. The course draws on findings in sociology, psychology, sociobiology, communications theory, and other social sciences to present an understanding of the social and political dimensions of modern wildland resource systems. Credit cannot be obtained for both ENCS 472 and FOR 472. Prerequisite: ★60 of university-level coursework or more. (Offered jointly by the Department of Renewable Resources and Rural Economy.) [Renewable Resources]

**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: FOREC 345, INT D 365, ECON 365 or INT D 369. [Rural Economy]

**ENCS 475 Waste Management and Utilization**

★3 (fi 6) (second term, 3-2s-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 utilization in agriculture, forest, and urban lands. Prerequisites: consent of the Instructor, must have completed at least ★60 at the university-level. [Renewable Resources]

**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]

**201.86 Environmental Engineering, ENV E**

Department of Civil and Environmental Engineering  
Faculty of Engineering

**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. (★3)

**ENV E 222 Chemical, Physical, and Biological Processes**

□3 (fi 6) (either term, 3-0-0). Theory of chemical, physical, and biological processes in environmental engineering. Chemical kinetics and equilibrium, biological growth and kinetics, elements of reactor design, sedimentation, filtration, absorption; precipitation, and gas transfer. Prerequisite: ENV E 220; Corequisite: BIOL 108. (★3)

**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. (★3)

**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. Prerequisites: CIV E 290, EAS 210. (★3)

**ENV E 400 Special Topics in Environmental Engineering**

□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 422. (★3)

**ENV E 402 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. Prerequisite: ENV E 222. (★3)

**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: ENV E 222, CIV E 331, ENV E 420. (★3)

**ENV E 422 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 402; Corequisite ENV E 421. (★3)

**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 421, ENV E 422. (★3)

**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: EAS 210, ENV E 351, CIV E 381. (★3)

**ENV E 440 Facility Design**

□4.5 (fi 6) (second 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. Prerequisites: ENV E 222, 421. (★3)

**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. (★3)

**201.87 Environmental Physical Sciences, ENVPS**

Departments of Chemistry; Earth and Atmospheric Sciences;  
and Physics  
Faculty of Science

**Undergraduate Courses****ENVPS 403 Industrial Internship Practicum**

★3 (fi 6) (first term, 0-3s-0). Required by all students who have just completed an Environmental Physical Sciences Industrial Internship Program. Must be completed during the first academic term following return to full-time studies. Note: A grade of 1 or 9 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. Prerequisite: WKEXP 402.

## 201.88 Etudes canadiennes, ETCAN

Faculté Saint-Jean

### 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 320 Les francophonies canadiennes I: implantation et institutionnalisation**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Les fondements des communautés francophones et acadiennes du Canada, par l'étude de documents d'époque et d'études scientifiques. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en CA FR 320, 322.

#### **ETCAN 322 Les francophonies canadiennes II: identité et minorité**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Le statut de minoritaire, les moyens juridiques et politiques susceptibles de favoriser son épanouissement, et les représentations de soi-même et des autres. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en CA FR 320, 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/Canadian, québécois et amérindiens, dans les traditions politiques, intellectuelles et artistiques du Canada. Prérequis: ★6 à sigle ETCAN/CANST ou à contenu canadien dans les disciplines suivantes: économie, histoire, science politique, sociologie; ou permission du Vice-doyen aux affaires académiques.

#### **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. Prérequis: SC PO 220 ou l'accord du Vice-doyen aux affaires académiques.

#### **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. Prérequis: ★6 à contenu canadien de niveau 300 ou 400, dont au moins ★3 à sigle ETCAN/CANST.

#### **ETCAN 520 Mémoire d'Etudes canadiennes**

★6 (fi 12) (aux deux semestres, 0-3s-0). Préparation du mémoire requis en quatrième année du programme de spécialisation en Etudes canadiennes.

## 201.89 Etudes classiques, ECLSS

Faculté Saint-Jean

### Cours de 1er cycle

#### **ECLSS 102 La mythologie grecque et romaine**

★3 (fi 6) (premier semestre, 3-0-0). Un aperçu de la mythologie au moyen de lectures choisies en traduction d'auteurs anciens et d'études contemporaines. Anciennement ECLSS 202.

#### **ECLSS 250 Le monde grec**

★3 (fi 6) (deuxième semestre, 3-0-0). Vie et société grecques illustrées par des découvertes archéologiques; l'âge de bronze, la cité, les temples, Athènes, Sparte, l'art et l'architecture grecs, le commerce et la guerre. Diapositives, films et autres documents.

#### **ECLSS 367 L'art grec archaïque et classique**

★3 (variable) (l'un ou l'autre semestre, 3-0-0). L'origine et le développement de l'art et de l'architecture grecs. Son rapport avec l'histoire culturelle et politique de l'époque.

#### **ECLSS 368 L'art helléniste et romain**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Le développement et le rôle de l'art et de l'architecture dans les royaumes helléniques et dans la république romaine: l'évolution de l'art impérial romain.

## 201.90 Etudes de la religion, ET RE

Faculté Saint-Jean

### Cours de 1er cycle

#### **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 judaïque, chrétienne et islamique. Anciennement ET RE 202.

#### **ET RE 202 Introduction à l'Ancien Testament**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction aux aspects littéraires et historiques de l'Ancien Testament. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en ET RE 231. Anciennement ET RE 331.

#### **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. Anciennement ET RE 348.

#### **ET RE 249 Introduction au Nouveau Testament**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude des premiers écrits de l'époque chrétienne, y compris les écrits apocryphes. On examine surtout la théologie de cette littérature et les images qui sont en voie de développement. Anciennement ET RE 349.

#### **ET RE 250 Jésus de Nazareth**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Une étude biblique et historique de Jésus: sa vie, sa mort, sa résurrection et son influence à travers les âges. Anciennement ET RE 350.

#### **ET RE 361 Symbolisme religieux**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude comparative des symboles religieux dans les différentes religions du monde: primitives, classiques et modernes. Une attention particulière sera accordée aux différentes approches et méthodes. Note: Ce Cours n'est pas accessible aux étudiants ayant ou postulant des crédits en ET RE 261.

## 201.91 Etudes interdisciplinaires, ETIN

Faculté Saint-Jean

### Cours de 1er cycle

#### **ETIN 520 Mémoire d'Etudes interdisciplinaires**

★6 (fi 12) (aux deux semestres, 0-3s-0). Préparation du mémoire requis en quatrième année du programme de spécialisation en Etudes interdisciplinaires.

## 201.92 Evaluation en éducation, EVAED

Faculté Saint-Jean

### Cours de 1er cycle

#### **EVAED 498 La mesure et l'évaluation en éducation**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). La définition des objectifs. La mesure critériée et normative. L'évaluation sommative, formative et diagnostique. Les étapes de la planification d'un examen. L'observation des élèves. L'évaluation des attitudes. L'analyse et l'interprétation des résultats.

## 201.93 Exchange Program, EXCH

International Centre

### 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 30) (Spring/Summer, unassigned).

#### **EXCH 811 Exchange Program**

★0 (fi 15) (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).

**201.94 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).

**201.95 Family Medicine, F MED**

Department of Family Medicine  
Faculty of Medicine and Dentistry

**Notes**

- (1) Family Medicine is included in MED 411, 417, 421, 425, 427, and 447.  
(2) The Department of Family Medicine is responsible for the Human Sexuality Course offered within the Faculty of Medicine and Dentistry.

**Undergraduate Courses****F MED 446 Student Internship in Rural Family Medicine**

★3 (fi 6) (either term, 4 weeks). For students in Phase III MD program only. Provides an opportunity for students to work with a designated rural family physician who holds a clinical appointment in the Department of Family Medicine.

**Course Beginning in 2000-2001****F MED 546 Rural Family Medicine Student Internship**

★4 (fi 8) (either term, 4 weeks). Student internship in Rural Family Medicine for students registered in the MD program.

**201.96 Family Studies, FAM**

Department of Human Ecology  
Faculty of Agriculture, Forestry, and Home Economics

**Note:** See also Consumer Studies; Human Ecology; and Textiles, Clothing, and Culture listings for related courses.

**Undergraduate Courses****FAM 110 Families in Today's World**

★3 (fi 6) (either term, 3-0-0). An introductory course family studies. Students are introduced to an ecosystems model of considering everyday family interactions. Examples from contemporary issues such as addictions, changing family structures, family caregiving, and family violence will also be considered from this perspective.

**FAM 215 Relationship Development**

★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.

**FAM 222 Human Sexuality**

★3 (fi 6) (either term, 3-0-0). An inquiry into the nature of sexual behavior, its personal and cultural sources and its personal, familial, and societal implications.

**FAM 312 Family Well-Being**

★3 (fi 6) (either term, 3-0-0). An examination of the principles of family health and of family problem solving. Prerequisite: FAM 110 or SOC 271 or consent of Instructor.

**FAM 323 Parent-Child Relationships**

★3 (fi 6) (either term, 3-0-0). An exploration of parent-child relationships during childhood and adolescence. A variety of educational, preventive, and treatment approaches to working with these families will be discussed. Prerequisite: PSYCO 223 or EDPY 200 or NURS 103 or 319.

**FAM 400 Understanding Family Communication**

★3 (fi 6) (either term, 3-0-0). The synthesis of knowledge of communication with knowledge of family relationships and the application of that combination to the student's experience. Emphasis is on the effect of communication on individual behavior and family patterns. Prerequisite: FAM 312 or consent of Instructor.

**FAM 410 Later Life Families**

★3 (fi 6) (either term, 3-0-0). An exploration of the interpersonal, personal and physical needs of the aging family throughout the latter stages of the family life cycle. Prerequisite: FAM 110. To be offered in alternate years.

**FAM 411 Family Policy**

★3 (fi 6) (either term, 2-2s-0). Principles and processes of policy development, implementation and analysis: examination of the current policy environment for Canadian families. Prerequisite: FAM 110 or SOC 271.

**FAM 412 Family Challenges**

★3 (fi 6) (either term, 3-0-0). The focus of this course is on families that are facing difficult challenges such as special needs children, alternative lifestyles and family patterns, chronic illness, addictions, eating disorders, and family violence. Empowerment principles will be used to assess community resources and interventions. Prerequisite: FAM 110 or SOC 271 or consent of Instructor.

**FAM 420 Ecological Perspectives on Aging**

★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: HECOL 102 or consent of Instructor. To be offered in alternate years.

**Graduate Courses****FAM 532 Family Health and Wellness: Theoretical and Measurement Issues for Research and Practice**

★3 (fi 6) (either term, 0-3s-0). Focus of course will be models of family health and research related to these models. Examination of the health of families and the family's influence on health. Discussion of measurement and assessment issues. Applications to nursing, family studies and other health-related disciplines. (Course is cross-listed as NURS 532).

**FAM 601 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. Corequisite: HECOL 601 or consent of Department.

**FAM 602 Theory in Family Ecology**

★3 (fi 6) (either term, 0-3s-0). Consideration of family theory as it relates to research and practice. Prerequisite or corequisite: FAM 601 or consent of Instructor.

**FAM 613 Graduate Practicum in Family Studies**

★3 (fi 6) (either term, 0-0-6). Selected practicum placements to integrate theory and practice in a variety of family agencies. Prerequisites: consent of Supervisor and Department.

**FAM 614 Seminar in Family Crisis**

★3 (fi 6) (either term, 0-3s-0). An analysis of the processes involved in family crisis. Family disorganization, reorganization, and change associated with various crises are considered. Prerequisite: FAM 110 or 211 or SOC 271 or consent of Instructor.

**FAM 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.

**FAM 620 Seminar in Human Sexuality**

★3 (fi 6) (either term, 0-3s-0). Analysis of sexuality issues framed in a bio-psycho-social context. Prerequisite: FAM 222 or equivalent.

**FAM 682 Fields of Practice, Applications and Evaluation**

★3 (fi 6) (either term, 0-3s-0). Study of the development of specific fields of practice from a human ecological perspective: examination of application, development, implementation and evaluation issues. Prerequisite: HECOL 380 or consent of Instructor.

**201.97 Film and Media Studies, F ST**

Department of Comparative Literature, Religion, and  
Film/Media Studies  
Faculty of Arts

**Undergraduate Courses****F ST 200 Introduction to the Study of Film**

★6 (fi 12) (two term, 3-0-3). A survey of major areas in film studies, emphasizing history, theory, film language, and the study of individual masterpieces. Prerequisites: ★6 in junior English, or ART H 101 and 102, or C LIT 100 or 201/202 or PHIL 140, or equivalent.

**F ST 205 The Fundamentals of Film**

★3 (fi 6) (either term, 3-0-3). Analysis of film language in terms of the primary tools of the filmmaker's art and of their relation to visual communication and aesthetic quality. Prerequisites: ★6 in junior English, or ART H 101 and 102, or C LIT 100 or 201/202, or PHIL 140, or equivalent.

**F ST 210 Introduction to the Study of Broadcast Media**

★6 (*fi 12*) (two term, 3-0-3). Provides students a broad-based introduction to mass media theories, texts and contexts, histories, audiences, business environments, and emerging new broadcast media forms. Prerequisites: ★6 in junior English, or ART H 101/102, or C LIT 100 or 201/202, or PHIL 101/102.

**F ST 301 The Art of the Filmmaker**

★6 (*fi 12*) (two term, 3-0-3). The course explores in detail the work of four or five filmmakers whose contributions have been central to the medium. Study will focus on the notion of style in film and on the articulation of themes and ideas through cinematic technique. Pre- or corequisite: F ST 200 or F ST 205 or consent of the program.

**F ST 310 Canadian Film**

★3 (*fi 6*) (either term, 3-0-3). Major trends in both English and French Canadian film, such as documentary, feature film, animation, and experimental film. Pre- or corequisite: F ST 200 or 205 or consent of the program. Formerly INT D 310.

**F ST 311 The Hollywood Film I: Cultural Models, Narrative Strategies and the History of the Industry**

★3 (*fi 6*) (either term, 3-0-3). A history of the American commercial film industry together with a consideration of selected Hollywood films as social cultural and aesthetic artifacts. Pre- or corequisite: F ST 200 or 205 or consent of the program. Formerly INT D 311.

**F ST 312 The Hollywood Film II: Genre**

★3 (*fi 6*) (either term, 3-0-3). The narrative patterns and cultural mythology of well defined genres (e.g. the Western, the Crime Film, the 'Women's Picture,' the Horror Film). Pre- or corequisite: F ST 200 or 205 or consent of the program. Formerly INT D 312.

**F ST 313 World Cinema Since 1945**

★3 (*fi 6*) (either term, 3-0-3). Developments in areas such as Italian Neo-Realism, the French New Wave, Japanese cinema, German film of the 1970s. Pre- or corequisite: F ST 200 or 205 or consent of the program. Formerly INT D 313.

**F ST 314 Film and the Representation of Women**

★3 (*fi 6*) (either term, 3-0-3). An examination of the ways in which the representation of women has contributed to both the construction and the dismantling of gender stereotypes of women in the twentieth century. Pre- or corequisite: F ST 200 or 205 or consent of the program. Formerly INT D 314.

**F ST 320 Sound in Film**

★3 (*fi 6*) (either term, 3-0-3). Some of the technical developments and aesthetic uses of sound in film from the early talkies of the late 1920s to the present. Pre- or corequisite: F ST 200 or 205 or consent of the program.

**F ST 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. Pre- or corequisite: F ST 200 or 205 or consent of the program.

**F ST 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. Pre- or corequisite: F ST 200 or 205 or consent of the program. Formerly INT D 401.

**F ST 353 Film and Television**

★3 (*fi 6*) (either term, 3-0-3). Independence and interdependence of film and television as visual media, cultural institutions and industries. Differences in technology and presentation, and their effects on film and television content and aesthetics. Pre- or corequisite: F ST 200 or 205 or consent of the program.

**F ST 361 Third World Cinema**

★3 (*fi 6*) (either term, 3-0-3). The course will examine a selection of films from Africa, Latin America, South and East Asia and the Middle East. Emphasis will be on cultural and socio-political context of film production and the often militant aesthetics of the filmmakers. Pre- or corequisite: F ST 200 or 205 or consent of the program.

**F ST 362 The French New Wave**

★3 (*fi 6*) (either term, 3-0-3). An historical and critical study of the body of films which began to take shape in the late 1950s around the influential journal *Cahiers du cinema*, and which revolutionized filmmaking around the world. Attention will be given to situate the work of Godard, Truffaut, Chabrol, Rivette, and Rohmer (as well as *Nouvelle vague* forerunners Resnais and Melville) within the tradition surrounding Realism, Modernism, and Avant-Garde. Pre- or corequisite: F ST 200 or 205 or consent of the program.

**F ST 363 Central and Eastern European Cinema**

★3 (*fi 6*) (either term, 3-0-3). A survey of major films produced in central and/or eastern Europe since World War II. Particular attention will be paid to the relationship between film and politics. Prerequisite: F ST 200 or 205 or consent of the program.

**F ST 371 Contemporary American Cinema**

★3 (*fi 6*) (either term, 3-0-3). Concentrating on American filmmaking since the

1960s, the course will focus on a selection of films which trace the rise of Postmodernism in contemporary American culture. Special attention will be given to defining Postmodernism and to situate it historically within the development of American cinema. Pre- or corequisite: F ST 200 or 205 or consent of the program.

**F ST 380 American and Canadian Media History**

★3 (*fi 6*) (either term, 3-0-3). A comparative analysis of the two countries' broadcasting systems and their histories. Prerequisites: F ST 210 or F ST 200/205 and consent of Instructor.

**F ST 381 Topics in Race and Ethnicity in the Media**

★3 (*fi 6*) (either term, 3-0-3). Prerequisites: F ST 210 or F ST 200/205 and consent of Instructor.

**F ST 382 Topics in Television Genres**

★3 (*fi 6*) (either term, 3-0-3). Prerequisites: F ST 210 or F ST 200/205 and consent of Instructor.

**F ST 383 Broadcast Media in a Global Context**

★3 (*fi 6*) (either term, 3-0-3). Explores broadcasting in different countries, challenges posed by the dominance of American media, and strategies used by national and American media, and strategies used by national and ethnic groups to use broadcast media in their own interests. Prerequisites: F ST 210 or F ST 200/205 and consent of Instructor.

**F ST 384 Television and the Representation of Women**

★3 (*fi 6*) (either term, 3-0-3). Examines how women have been portrayed on television, how particular genres have appealed to women, and how female audiences have negotiated with their televisual images. Prerequisites: F ST 314 or consent of Instructor.

**F ST 385 Critical Analysis of Television**

★3 (*fi 6*) (either term, 3-0-3). Examines different methodologies and critical approaches to understanding how television functions as a medium and a cultural form. Prerequisites: F ST 210 or F ST 200/205 and consent of Instructor.

**F ST 399 Special Topics in Film Studies**

★3 (*fi 6*) (either term, 3-0-3). Pre- or corequisite: F ST 200 or 205 or consent of the program.

**F ST 401 Film Theory and Criticism I**

★3 (*fi 6*) (either term, 3-0-0). Readings in film theory. The history of film theory, and concentration on developments in structuralist/semiotic, Marxist, Feminist and psychoanalytic film theory. Prerequisites: F ST 200 or 205 and one F ST 300-level course or consent of the Film Studies program. Formerly INT D 401.

**F ST 402 Film Theory and Criticism II**

★3 (*fi 6*) (either term, 3-0-3). Application of film theory to 'test-case' films, featuring analysis of selected films using the tools and assumptions of specific theories. Prerequisites: F ST 200 or 205 and one F ST 300-level course or consent of the Film Studies program.

**F ST 403 Genre Theory**

★3 (*fi 6*) (either term, 0-3s-1). Advanced study in genre theory. Examines the notion of genre and its relevance as a theoretical and critical tool for the study of film. Prerequisites: F ST 200 or 205 and ★3 in F ST or consent of the Film Studies program.

**F ST 404 Film Narrative**

★3 (*fi 6*) (either term, 3-0-3). The elements of visual/auditory storytelling, with emphasis on the structure and conventions of dominant narrative types, together with a consideration of alternative narrative forms. Prerequisites: F ST 200 or 205 and one F ST 300-level course or consent of the Film Studies program.

**F ST 410 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. Prerequisites: F ST 200 or 205 and one F ST 300-level course or consent of the Film Studies program.

**F ST 411 Topics in Canadian Film and Media**

★3 (*fi 6*) (either term, variable). An historical and critical survey of television in the Canadian context. The course examines the development of public and private broadcasting in Canada focusing on issues of nationalism. French versus English, anxieties about American popular culture, and the nature of popular entertainment in Canada. The course also examines the media theories of McLuhan, debates around media imperialism, and recent Canadian cultural studies approaches to popular television. Pre- or corequisite: F ST 200 or 205 and one 300-level course or consent of program.

**F ST 412 Topics in Film Studies**

★3 (*fi 6*) (either term, variable). A seminar-based examination of specialized topics in film. Prerequisites: F ST 200 or 205 and one F ST 300-level course or consent of the Film Studies program.

**F ST 420 Topics in Media Studies**

★3 (*fi 6*) (either term, 3-0-3). Prerequisites: F ST 210 with 300-level course, or F ST 200/205 with a 300-level course and consent of Instructor.



**F ST 421 Canadian Broadcast Media**

★3 (fi 6) (either term, 3-0-3). Historical and critical survey of television in the Canadian context. Prerequisites: F ST 210 with 300-level course, or F ST 200/205 and consent of Instructor.

**F ST 422 Topics in Media and Gender**

★3 (fi 6) (either term, 3-0-3). Revolving content course. Prerequisites: F ST 210 with 300-level course, or F ST 200/205 with a 300-level course and consent of Instructor.

**F ST 423 Media Historiography**

★3 (fi 6) (either term, 0-3s-3). Methods for analyzing popular media and television as historical artifacts. The course explores theories about history in relation to media and television. Prerequisites: F ST 210 with 300-level course, or F ST 200/205 with a 300-level course and consent of Instructor.

**F ST 424 Broadcast Media and Contemporary Theory**

★3 (fi 6) (either term, 0-3s-3). Recent theorizing about popular media, especially in the British Cultural Studies tradition. Prerequisites: F ST 210 with 300-level course, or F ST 200/205 with a 300-level course and consent of Instructor.

**□ F ST 491 Directed Study**

★3 (fi 6) (either term, 0-3s-0). Prerequisites: ★3 at the 300-level in Film Studies, and consent of the program.

## 201.98 Finance, FIN

Department of Finance and Management Science  
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, 3-0-0). 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: MGTSC 301 or equivalent. Corequisite: 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. Pre- or corequisite: MGTSC 352.

**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.

**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. Pre- or corequisite: MGTSC 352.

**FIN 424 Financial Valuation**

★3 (fi 6) (either term, 3-0-0). Financial valuation of public and private entities. Estimation of growth, cost of capital and cash flow. Use of financial ratios. Valuation and options. Corporate strategy, intellectual capital and firm value. Prerequisite: FIN 301.

**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. Pre- or corequisite: MGTSC 352.

**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<sup>®</sup>. 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 practicing 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, 424. 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 488 Selected Topics in Finance**

★3 (fi 6) (either term, 3-0-0). Prerequisites: FIN 301 and consent of Department Chair.

**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 the the 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 521 Financial Valuation**

★1.5 (fi 3) (either term, 18 hours). This course introduces the valuation of financial assets such as bonds and stocks. Similar techniques are used to value capital investments. Both private and public sector applications are considered. Fundamental concepts in asset valuation such as diversification strategies are discussed within the context of simple asset pricing models and efficient financial markets. This course contains computer assignments and requires the use of spreadsheets. Offered in a six-week period. Prerequisites or corequisites: MANEC 501, MGTSC 521.

**FIN 531 Financial Management**

★1.5 (fi 3) (either term, 18 hours). Financial market efficiency is reviewed in the context of a firm's cost of capital. Further topics include the issuing of financial securities, leverage, and dividend policy. Methods of risk management, including the use of derivative securities, are discussed. This course contains some computer assignments. Offered in a six-week period. Prerequisite: FIN 521.

**FIN 541 Financial Performance Analysis**

★1.5 (fi 3) (either term, 18 hours). This course will cover financial valuation of public and private entities, cost of capital, and forecasting of performance and growth. Offered in a six-week period. Prerequisite: FIN 531.

**FIN 586 Selected Topics in Finance**

★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.

**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 531.

**FIN 616 Securities Markets and Investment Banking**

★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 market for government securities, the organization and changing structure of investment dealers, underwriting compensation, merits of issuing securities through negotiation versus competitive bidding, right versus underwriting, direct placement, and the role of investment dealers in pricing new issues. In addition, the organization of secondary markets, pricing of brokerage and dealer services, relative merits of organizing trading in the form of a continuous auction vis-à-vis a negotiated market, and the economics of money management will be studied. Prerequisite: FIN 502.

**FIN 618 Fixed Income Securities**

★3 (fi 6) (either term, 3-0-0). This course is devoted to the study of bonds and related financial instruments. Important topics will include interest rate risk, and valuation of loans and securities with interest rate exposure. Prerequisite: FIN 531 and MGTSC 521.

**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 502.

**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: MANEC 502.

**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 502.

**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 502.

**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 502.

**FIN 698 Individual Study Project in Finance**

★3 (fi 6) (either term, 3-0-0).

**FIN 701 Advanced Seminar in Finance I**

★3 (fi 6) (either term, 3-0-0).

**FIN 702 Advanced Seminar in Finance II**

★3 (fi 6) (either term, 3-0-0).

**FIN 703 Advanced Seminar in Finance III**

★3 (fi 6) (either term, 3-0-0).

**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). Seminar participants will present, discuss, and critique important papers on the frontiers of current research. Members of the faculty and visiting scholars will also present frequent talks on various topics. Students taking the course for credit are expected to present original work related to their doctoral theses. This seminar is a single-term course offered over the full session. Prerequisites or corequisites: FIN 701, 702, and 703, or permission of the Instructor.

**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.

**201.99 Fondements de l'éducation, FO ED**

Faculté Saint-Jean

**Cours de 1er cycle****FO ED 200 Analyse historique et sociologique de l'école**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Une introduction à l'étude des relations entre l'école publique et la société afin d'initier les étudiants à l'importance des sciences sociales en éducation. L'analyse historique portera sur l'évolution des lois qui déterminent la structure et l'administration des écoles ainsi que la professionnalisation de l'enseignement. Ce cours n'est pas accessible aux étudiants ayant des crédits en FO ED 201, 205, 206, 301 et 457.

**FO ED 205 Sociologie de l'éducation**

★1.5 (fi 3) (l'un ou l'autre semestre, 1.5-0-0). Une introduction à l'étude des relations entre l'école publique et la société. Les questions de l'égalité des chances, du racisme et du retour aux compétences de base seront abordées à partir d'une analyse sociologique afin d'initier les étudiants à l'importance des sciences sociales en éducation. Ce cours n'est pas accessible aux étudiants ayant des crédits en FO ED 201, 301.

**FO ED 206 Histoire et administration des écoles publiques au Canada**

★1.5 (fi 3) (l'un ou l'autre semestre, 1.5-0-0). Une introduction à l'étude historique des écoles publiques au Canada avec une insistance sur l'Ouest canadien. L'étude sera faite en examinant les antécédents historiques de certains problèmes scolaires. Ce cours n'est pas accessible aux étudiants ayant des crédits en FO ED 201, 301.

**FO ED 302 Histoire de la pensée en éducation**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). La recherche des questions philosophiques sous-jacentes à tout système d'éducation dans un monde multiculturel et dont l'objectif général est la formulation de sa propre pensée éducative. Ce cours n'est pas accessible aux étudiants ayant des crédits en FO ED 452, 455 457.

**FO ED 307 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 situation 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. Ce cours n'est pas accessible aux étudiants ayant des crédits en CU ME 357, FO ED 350 et FO ED 401.

**FO ED 350 Contexte et réalités de l'éducation française**

★1.5 (fi 3) (l'un ou l'autre semestre, 1.5-0-0). Ce cours veut permettre une compréhension du contexte et des réalités de l'éducation française en situation d'immersion et en milieu francophone minoritaire.

**FO ED 401 L'école française en situation minoritaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Son historique et sa situation sur le plan national, son rôle, ses buts, sa création, sa gestion et ses programmes. Les besoins auxquels elle doit répondre. L'article 23 et la loi scolaire. Le rôle des parents et des enseignants. L'école française et les programmes d'immersion: distinction et comparaison. Avenir de l'école française au Canada et en Alberta.

**FO ED 455 Histoire de la pensée en éducation**

★1.5 (fi 3) (l'un ou l'autre semestre, 1.5-0-0). Une étude des grands auteurs en philosophie de l'éducation tels que Platon, Rousseau, Locke, Dewey. Ce cours n'est pas accessible aux étudiants ayant des crédits en FO ED 452.

**FO ED 457 Philosophie du multiculturalisme**

★1.5 (fi 3) (l'un ou l'autre semestre, 1.5-0-0). Une analyse des droits des minorités face à ceux de la majorité, de la préservation des cultures, et des droits de l'individu devant ceux des groupes. Une attention particulière sera portée aux implications pour l'éducation en langue officielle et l'éducation multiculturelle

**201.100 Forest Economics, FOREC**

Department of Rural Economy

Faculty of Agriculture, Forestry, and Home Economics

**Undergraduate Courses**

**Note:** See also INT D 365, 369, 465, and 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.

**FOREC 345 Economics of Forestry**

★3 (fi 6) (either term, 3-0-0). Economic aspects of forest production, marketing, finance, and policy. Prerequisite: ECON 101/102.

**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.

**FOREC 473 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: FOREC 345, INT D 365 or INT D 369. (Offered jointly by the Departments of Renewable Resources and Rural Economy.) [Rural Economy]

**Graduate Courses****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. Note: May be repeated for credit one time. Prerequisite: consent of Department Chair.

### **Q 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.

## 201.101 Forest Engineering, FOREN

Department of Renewable Resources  
Faculty of Agriculture, Forestry, and Home Economics

### Undergraduate Courses

#### **L FOREN 201 Forest Surveying Methods and Applications**

★3 (fi 6) (first term, 3-0-3). Methods and applications of surveying, Geo-Positioning Systems (GPS), photogrammetry and photo interpretation to forestry.

#### **L FOREN 310 Wood Science and Technology**

★3 (fi 6) (first term, 3-0-3). The anatomy and identification of North American woods; biological, chemical and physical properties of wood and its components; growth, natural and processing defects; lumber grading.

#### **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.

#### **L FOREN 400 Topics in Wood Utilization**

★3 (fi 6) (either term, 0-3s-0). Individual study. Directed study in wood utilization relating to solid wood products manufacturing and/or pulp and paper technology. Prerequisite: FOREN 310 or FOREN 345.

#### **L FOREN 421 Simulation Methods in Forest Engineering**

★3 (fi 6) (second term, 3-0-3). Continuous and discrete simulation methods applied to the study of processes in forest operations. Prerequisites: Introductory courses in computing science and calculus. Not open to students with credit in AG EN 421.

#### **L FOREN 435 Advanced Transportation of Forest Products**

★3 (fi 6) (second term, 3-0-3). Advanced studies in the methods and systems of movement of wood and wood products. Equipment for primary and secondary transportation of timber. Planning and cost analysis of logging operations and equipment. Forest roads and bridges. Prerequisite: FOREN 335.

### Graduate Courses

#### **L FOREN 550 Problems in Forest Engineering**

★3 (fi 6) (either term, 3-0-0). Directed study in forest engineering, including forest harvesting, road location and construction. Prerequisite: consent of Instructor.

#### **L FOREN 560 Trends and Problems in Wood Science I**

★3 (fi 6) (either term, 0-3s-0). Individual study. Directed study in wood technology and forest products. Prerequisite: consent of Instructor.

#### **L FOREN 561 Trends and Problems in Wood Science II**

★3 (fi 6) (either term, 0-3s-0). Individual study. Directed study in wood technology and forest products. Prerequisite: consent of Instructor.

#### **L FOREN 650 Selected Topics in Forest Engineering**

★3 (fi 6) (either term, 3-0-0). Individual study.

#### **L FOREN 660 Selected Topics in Wood Science I**

★3 (fi 6) (either term, 0-3s-0). Individual study.

#### **L FOREN 661 Selected Topics in Wood Science II**

★3 (fi 6) (either term, 0-3s-0). Individual study.

## 201.102 Forest Science, FOR

Department of Renewable Resources  
Faculty of Agriculture, Forestry, and Home Economics

### Notes

(1) See also Agricultural Economics (AG EC), 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 table lists renumbered courses effective 1996/97:

Old	New	Old	New
FOR 110	REN R 110	FOR 439	REN R 439
FOR 120	REN R 120	FOR 475	REN R 475
FOR 321	REN R 321	FOR 490	REN R 490
FOR 420	REN R 420	FOR 601	REN R 601
FOR 421	REN R 421	FOR 602	REN R 602
FOR 430	REN R 430		

The following table lists renumbered courses effective 1997/98:

Old	New
FOR 401	REN R 410

### 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.

#### **FOR 101 Introductory Forestry Field School**

★0 (fi 3) (first term, 5 days). A general overview of the practice of Forestry. This five-day orientation includes an introduction to basic forest measurements, forest management practices, and will include tours of a number of major mill operations in Alberta. Five days prior to Fall registration. Course requires payment of additional miscellaneous fees (see §22.2.3).

#### **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: REN R 110, MATH 113, and ★3 of statistics.

#### **FOR 302 Forest Measurements Field Camp**

★1 (fi 2) (Spring/Summer, 6 days). Six days of forest measurement field work off campus. Conducted immediately following Winter Term final examinations. Required of all students pursuing the BSc in Forestry or Forest Business Management. Students are required to schedule FOR 302 in the same year as FOR 303 and FOR 304. Prerequisites: FOR 101, (FOR 120 or REN R 120), FOR 210, and FOREN 201. Course requires payment of additional miscellaneous fees (see §22.2.3).

#### **FOR 303 Forest Engineering Field Camp**

★1 (fi 2) (Spring/Summer, 6 days). Six days of forest engineering field work off campus. Conducted immediately following Winter Term final examinations. Required of all students pursuing the BSc in Forestry or Forest Business Management. Students are required to schedule FOR 303 in the same year as FOR 302 and 304. Prerequisites: FOR 101, (FOR 120 or REN R 120), FOR 210, and FOREN 201. Course requires payment of additional miscellaneous fees (see §22.2.3).

#### **FOR 304 Forest Ecology Field Camp**

★1 (fi 2) (Spring/Summer, 6 days). Six days of silviculture and ecology field work off campus. Conducted immediately following Winter Term final examinations. Required of all students pursuing the BSc in Forestry or Forest Business Management. Students are required to schedule FOR 304 in the same year as FOR 302 and FOR 303. Prerequisites: FOR 101, (FOR 120 or REN R 120), FOR 210 and FOREN 201. Course requires payment of additional miscellaneous fees (see §22.2.3).

#### **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 or ENCS 202. [Renewable Resources]

#### **L FOR 322 Forest Ecosystems**

★3 (fi 6) (first term, 3-0-3). Analysis of the structure and function of forest communities and ecosystems. Topics include: community composition, structure,

classification, and succession; energy flow, productivity, nutrient cycling, environmental impact of forest management. A one-day weekend field trip is required. This course requires the payment of additional miscellaneous fees. See §22.2.3 for details. Prerequisite: BOT 130 or BIOL 208 or both BIOL 108 and REN R 120.

#### 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. This course requires the payment of additional miscellaneous fees. See §22.2.3 for details. Prerequisite: REN R 321 strongly recommended.

#### FOR 340 Forest Fire Management

★3 (fi 6) (second term, 3-0-3). Fire thermodynamics, combustion energetics, fire behavior, fuels measurement and manipulation, and fire effects; prevention, detection, suppression, settlement protection, preattack planning, and prescribed burning as part of sophisticated forest management.

#### FOR 350 Forest and Range Hydrology

★3 (fi 6) (second term, 3-0-3). The role of forest and range vegetation in determining the hydrologic function of a watershed; natural storage phenomena of the forest land surface and ways it can be modified; field trips. Prerequisite: SOILS 210.

#### FOR 372 Forestry and the Environment

★3 (fi 6) (second term, 3-0-3). Introduction to forest ecology, forest resources and forest management for non-foresters. Examination of environmental issues and land use impacts associated with forestry practices and their resolution. A one day weekend field trip will be required. This course requires the payment of additional miscellaneous fees. See §22.2.3 for details. Prerequisite: third year University standing. Not open to forestry majors.

#### 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.

#### 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.

#### FOR 427 Tree Seedling Production

★3 (fi 6) (second term, 3-0-3). Theory and current practice of the production of tree seedlings. Includes discussion of seed collection and handling, seedling ecophysiology in relation to the nursery environment, hardening and storage of container and bare root seedlings. Will include guest speakers and student seminars. Prerequisite: consent of Instructor. Offered in alternate years.

#### FOR 431 Integrated Forest Management

★3 (fi 6) (first 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. This course is the capstone course for the forest management major and should be taken concurrently with FOREC 473. Course requires payment of additional miscellaneous fees (see §22.2.3). Prerequisite: FOR 302, 303, 304, 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]

#### FOR 433 Forest Growth and Yield Prediction

★3 (fi 6) (first term, 3-0-3). Selected topics in forest mensuration, regression analysis, growth and yield prediction. Sampling methods, growth models and data management. Prerequisite: FOR 210.

#### FOR 450 Forest Watershed Management

★3 (fi 6) (first term, 3-0-0). Seminar presentations and discussions on the principles and methods involved in managing forest and range land to obtain optimum production and regulation of water yields while maintaining soil stability; watershed management as a component of integrated forest resources management. Prerequisite: FOR 350. Offered in alternate years.

## Graduate Courses

### Notes

- (1) FOREC 545, FOREN 550, 560, 561, 650, 660, 661 may also be taken as a FOR credit.
- (2) The following undergraduate courses may be taken for credit by graduate students: CAPS 431; ENCS 460, 462, 463, 464, 475; FOREC 445, 473; INT D 465, 466; FOREN 435; FOR 350, 401, 405, 423, 427, 433, 450; REN R 420, 421, 430, 439, 490.

#### FOR 501 Special Topics in Forestry

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

#### 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.

#### FOR 503 Problems in Silviculture

★3 (fi 6) (either term, 0-3s-0). Individual study. Directed study in silviculture. Prerequisite: consent of Instructor.

#### 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 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.

#### 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.

#### FOR 546 Advanced Fire Ecology

★3 (fi 6) (second term, 3-0-0). The role of fire as a forcing function in ecosystem dynamics in the physical components (energy flows and nutrient cycling) and in the biotic components (individual, populations, and community levels). The role of fire in high profile scientific questions such as climate change, rainforest clearing and smoke pollution should be useful for students in zoology, botany, and geography as well as forest science, wildlife science, plant science, and conservation science. Note that this course follows the introductory FOR 340. Prerequisites: A basic ecology course and consent of Instructor.

#### 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.

#### FOR 565 Problems in Forest Recreation

★3 (fi 6) (either term, 0-3s-0). Individual study. Directed study in forest recreation. Prerequisite: consent of Instructor.

#### FOR 590 Seminar in Tree Improvement

★3 (fi 6) (second term, 0-3s-0). Reports and discussion of current literature and advanced topics in forest genetics and tree improvement. Prerequisites: Graduate standing and consent of Instructor; FOR 490 or REN R 490 recommended.

#### FOR 610 Research Methods in Forestry

★3 (fi 6) (second term, 3-2s-0). Use of the scientific method in forestry research, formulation of hypotheses, design of experiments, interpretation of data. Prerequisite: consent of Instructor.

## 201.103 Français, FRANC

### Faculté Saint-Jean

Les numéros de certains cours au niveau du Baccalauréat à la Faculté Saint-Jean ont été changés. La liste suivante indique les changements en 1990-91:

ancien	nouveau	ancien	nouveau
FRANC 210	FRANC 110	FRANC 214	FRANC 114
FRANC 213	FRANC 113		

La liste suivante indique les changements en 1991-92:

ancien	nouveau	ancien	nouveau
FRANC 110	FRANC 160	FRANC 324	FRANC 395
FRANC 113	FRANC 165	FRANC 343	FRANC 274
FRANC 114	FRANC 166	FRANC 420	FRANC 470
FRANC 310	FRANC 261	FRANC 421	FRANC 431
FRANC 315	FRANC 262	FRANC 422	FRANC 432
FRANC 319	FRANC 267	FRANC 425	FRANC 475
FRANC 321	FRANC 272		

### Voie intermédiaire

FRANC 160, 161, 162, 163 (1ère année)  
FRANC 264 (2e année)  
FRANC 322

### Voie avancée

FRANC 165, FRANC 166 (1ère année)  
FRANC 267 (2e année)  
FRANC 322

### Notes

- (1) Le tableau ci-dessus indique les cours obligatoires suivant la voie dans laquelle est orienté un étudiant et le moment où ils doivent être pris.
- (2) Un étudiant ayant réussi des cours de la voie avancée ne peut se réorienter vers la voie intermédiaire ou postuler des crédits pour les cours de cette voie et vice versa.
- (3) Un seul cours de français au niveau 100 peut être crédité, sauf pour les étudiants dans la voie intermédiaire.

## Cours de 1er cycle

**O FRANC 101 Communication orale et écrite**

★6 (fi 12) (Printemps/Été, 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. Ce cours se destine aux étudiants qui ne disposent pas de la base nécessaire pour satisfaire les exigences du FRANC 160 (French 30 ou l'équivalent) et n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 100 à la Faculté des Arts.

**O FRANC 140 Communication orale et écrite**

★6 (fi 12) (Printemps/Été, 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. La note finale sera évaluée 60% à l'oral, 40% à l'écrit. Prérequis: French 30 ou l'équivalent, ou FRANC 101 ou FREN 100. Ce cours peut être crédité pour FRANC 160 et n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 150 à la Faculté des Arts.

**FRANC 160 Le français oral (Niveau intermédiaire, I)**

★3 (fi 6) (l'un ou l'autre semestre, 0-5L-0). Étude du français parlé: vocabulaire et structures. Travaux pratiques d'écoute, de lecture et d'expression en séminaires et au laboratoire. Prérequis: French 30, ou équivalent. Affectation par test de classement. Corequis: FRANC 161. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 150 ou 152 à la Faculté des Arts.

**FRANC 161 Le français écrit (Niveau intermédiaire, I)**

★3 (fi 6) (l'un ou l'autre semestre, 0-5L-0). Étude du français écrit. Compréhension de textes. Acquisition des structures de base. Exercices de rédaction dirigée. Initiation à l'autocorrection. Prérequis: French 30, ou équivalent. Corequis: FRANC 160. Affectation par test de classement. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 150 ou 152 à la Faculté des Arts.

**FRANC 162 Pratique du français oral (Niveau intermédiaire, II)**

★1.5 (fi 3) (l'un ou l'autre semestre, 0-3L-0). Ce cours est normalement la suite de FRANC 160. Travaux pratiques de lecture, d'écoute et d'expression en séminaires et au laboratoire. Exposés. Conversation libre et dirigée. Prérequis: FRANC 160 ou équivalent. Corequis: FRANC 163.

**FRANC 163 Pratique du français écrit (Niveau intermédiaire, II)**

★1.5 (fi 3) (l'un ou l'autre semestre, 0-4L-0). Ce cours est normalement la suite de FRANC 161. Étude de l'expression écrite. Lecture. Travaux de rédaction dirigée avec autocorrection. Prérequis: FRANC 161 ou équivalent. Corequis: FRANC 162.

**FRANC 165 Le français actuel, I (Niveau avancé)**

★3 (fi 6) (premier semestre, 0-5L-0). Développement de l'expression orale et écrite. Étude de la morphologie et des structures du français. Travaux d'application. Expression orale libre et dirigée. Exercices de rédaction dirigée. Initiation à l'autocorrection. Prérequis: French 30 ou l'équivalent. Affectation par test de classement. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 250 à la Faculté des Arts.

**FRANC 166 Le français actuel, II (Niveau avancé)**

★3 (variable) (deuxième semestre, 0-5L-0). Enrichissement de l'expression orale et écrite. Ce cours est la suite de FRANC 165. Lecture, expression orale libre et dirigée. Travaux de rédaction dirigée avec autocorrection. Prérequis: FRANC 165. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 250 à la Faculté des Arts. Course à distance. Voir \$200.

**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 méthodologies présentées. Prérequis: FRANC 264 ou 267, ou l'accord 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 socio-historico-culturelle, 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 dans des extraits de texte tirés d'oeuvres représentatives à travers les siècles. Prérequis: FRANC 264 ou 267, ou l'accord du Vice-doyen aux affaires académiques.

**O FRANC 241 Communication orale et écrite**

★6 (fi 12) (Printemps/Été, 3-0-3). Perfectionnement du français écrit et, surtout, oral. Ce cours se destine à l'étudiant ayant réussi FRANC 162 et FRANC 163 ou FREN 150, et se veut complémentaire au FRANC 264 et au FRANC 272.

**FRANC 264 De la lecture à l'écriture-Niveau intermédiaire**

★3 (fi 6) (l'un ou l'autre semestre, 0-4L-0). Développement de l'expression écrite. Étude de textes. Les diverses formes d'écrits. La textualité. Travaux de composition. Pratique de l'autocorrection. Préparation à la dissertation. Prérequis: FRANC 162 et 163. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 350 à la Faculté des Arts. Anciennement FRANC 262.

**FRANC 267 De la lecture à l'écriture-Niveau avancé**

★3 (variable) (l'un ou l'autre semestre, 0-3L-0). Perfectionnement de l'expression écrite. Étude de textes. Les diverses formes d'écrits. La textualité. Travaux de composition. Pratique de l'autocorrection. Préparation à la dissertation. Prérequis: FRANC 166 ou affectation par test de classement. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 350 à la Faculté des Arts. Course à distance. Voir \$200.

**FRANC 272 La rédaction française**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude des méthodes de la rédaction. L'expression des idées: étude du vocabulaire et de la phrase. Travaux de rédaction. Prérequis: FRANC 166 ou FRANC 162/163, ou l'équivalent. Note: ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 350 ou 358 à la Faculté des Arts.

**FRANC 273 Expression orale et phonétique corrective**

★3 (fi 6) (l'un ou l'autre semestre, 0-3L-0). Développement de l'expression orale en français à partir de textes et d'exercices communicatifs. Étude des sons du système phonatoire français. Cours s'adressant aux étudiants dont le français n'est pas la langue dominante.

**O FRANC 314 Pratique avancée du français oral et écrit**

★6 (fi 12) (Printemps/Été, 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 264, en FRANC 272 ou en FREN 250, ou bien renforcer certaines connaissances et compétences acquises en FRANC 322.

**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 de données. 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. Prérequis: FRANC 264, ou 267, ou l'équivalent.

**O FRANC 325 Littérature française du XVIIe siècle**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Études d'oeuvres représentatives du XVIIe siècle. Prérequis: FRANC 235.

**O FRANC 326 Littérature française du XVIIIe siècle**

★3 (fi 6) (deuxième semestre, 3-0-0). Évolution des genres littéraires illustrée par des textes du XVIIIe siècle. Prérequis: FRANC 235. Note: ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 360 à la Faculté des Arts.

**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. Prérequis: FRANC 235. Note: ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 380 à la Faculté des Arts.

**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. Prérequis: 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 à la Faculté des Arts.

**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. Prérequis: FRANC 264 ou 267 ou 272 ou l'équivalent. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 351 ou 352.

**FRANC 332 Étude avancée du français et de l'anglais II**

★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, suite. Prérequis: FRANC 331 ou l'équivalent. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 351 ou 352.

**FRANC 431 Grammaire comparée du français et de l'anglais**

★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. Prérequis: FRANC 262 ou 267 ou l'équivalent. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 400 à la Faculté des Arts. Note: Ce cours exige une bonne connaissance du français et de l'anglais.

**FRANC 432 Stylistique comparée du français et de l'anglais**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Comparaison des moyens d'expression du français et de l'anglais. Traduction: théorie et pratique. Travaux d'application. Prérequis: FRANC 262 ou 267 ou l'équivalent. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour FREN 400 à la Faculté des Arts. Note: Ce cours exige une bonne connaissance du français et de l'anglais; il est recommandé à l'étudiant de suivre auparavant le cours FRANC 431.

**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. Prérequis: FRANC 262 ou 267 ou l'équivalent.

**FRANC 475 Stylistique du français**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Initiation aux procédés stylistiques. Prérequis: FRANC 322 ou l'équivalent.

**FRANC 480 Choix de sujet**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Prérequis: FRANC 225, 235 et ★3 en littérature de niveau 300.

**FRANC 482 Choix de sujet**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Prérequis: FRANC 225, 235 et ★3 en littérature 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. Prérequis: FRANC 225, 235 et ★3 en littérature de niveau 300. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en 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. Prérequis: FRANC 325 et 2 demi-cours de 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.

**Cours de 2e cycle****FRANC 580 Choix de sujet en littérature française et francophone**

★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. Prérequis: FRANC 225, 235, CA FR 350, ★3 en littérature de niveau 400, ou l'accord du Vice-doyen aux affaires académiques.

**201.104 French Language and Literature, FREN**

Department of Modern Languages and Cultural Studies:  
Germanic, Romance, Slavic  
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, or they may be encouraged to seek "Credit by Special Assessment" (see §44.5) where 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 course, credit may be withheld.

The following table lists renumbered courses effective 1990/91:

Old	New	Old	New
FREN 200	FREN 150	FREN 206	FREN 156
FREN 205	FREN 155	FREN 311	FREN 246

**Undergraduate Courses****FREN 100 Introductory French**

★6 (fi 12) (two term, 5-0-0). Designed for students with little or no previous background in French. This course covers material in matriculation-level French and allows students to proceed into study of French at the university-level. Normally, students will go from FREN 100 to 150. Note: Not open to students with matriculation in French, i.e. French 30 or equivalent (e.g. French 20S or 20N, etc.). Refer to §14.4.3(1) for all equivalent courses offered in Alberta High Schools. Students from out-of-province should consult the Department Office to determine if any prior French courses taken may be the equivalent of French 30.

**FREN 150 First-Year University French**

★6 (fi 12) (two term, 5-0-0). Intensive training in spoken and written French, including grammar, composition, and literature. Prerequisite: FREN 100 or French

30 or equivalent. Note: Students with a final grade of 85% or more in French 30 interested in advanced placement may take a placement test to enter FREN 251/252. Students presenting IB French or Langue et Littérature 30 (now French Language Arts 30) should register in FREN 257.

**FREN 155 French Reading Comprehension**

★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 open to students who have successfully completed French courses at the 200-level or higher. Note: Not accepted to meet the requirements in a principal area of concentration.

**FREN 156 Further Reading in French**

★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 open to students who have successfully completed French courses at the 200-level or higher. Note: Not accepted to meet the requirements in a principal area of concentration.

**FREN 233 French Cultural Moments**

★3 (fi 6) (either term, 3-0-0). This course uses the study of various intellectual, cultural, and historical events, to provide students with a window onto the French world. Prerequisite: FREN 150 or consent of Department.

**FREN 251 Intermediate University French**

★3 (fi 6) (either term, 3-0-2). Prerequisite: FREN 150. Note: Not open for credit to students having credit in either FREN 250 or FRANC 165.

**FREN 252 Reading and Writing in French**

★3 (fi 6) (either term, 3-0-2). Prerequisite: FREN 150. Note: Not open for credit to students having credit in either FREN 250 or FRANC 166.

**FREN 253 Contrastive Analysis of French and English**

★3 (fi 6) (either term, 3-0-0). Prerequisite: FREN 150.

**FREN 257 Accelerated Language Course for Honors Students**

★3 (fi 6) (either term, 3-0-0). Prerequisite: consent of Department. Note: Not open for credit to students having credit in FREN 258.

**FREN 275 Introduction to French Linguistics I**

★3 (fi 6) (either term, 3-0-0). An introduction to the basic concepts of linguistics, through a description of contemporary French, beginning with the origins of structuralist approaches to language and their relevance for contemporary linguistic analysis, followed by a structural study of French, concentrating on the sound system, agreement marking and word-building processes. Prerequisite: FREN 150.

**FREN 276 Introduction to French Linguistics II**

★3 (fi 6) (either term, 3-0-0). This course builds on notions developed in FREN 275, concentrating on the lexical, morphosyntactic, syntactic and semantic levels. All analyses will be made from a linguistic perspective and will be based on data drawn from contemporary French (written and oral). Notions such as regional and sociolinguistic variation in French will also be discussed. Prerequisite: FREN 275.

**FREN 301 Introduction to French Literary Studies**

★3 (fi 6) (either term, 3-0-0). Prerequisite: FREN 251 and 252, or 257. Note: Not open for credit to students having credit in FREN 300.

**FREN 320 Introduction to French Literature**

★3 (fi 6) (either term, 3-0-0). Prerequisite: FREN 150 or FREN 156 or consent of Department. Note: Language of instruction is English.

**FREN 333 Francophone Cultural Practices**

★3 (fi 6) (either term, 3-0-0). Prerequisites: FREN 251 and 252, or 257.

**FREN 341 Narrative Literature in French**

★3 (fi 6) (either term, 3-0-0). Prerequisite or corequisite: FREN 301.

**FREN 342 Drama in French**

★3 (fi 6) (either term, 3-0-0). Prerequisite: FREN 301.

**FREN 343 Popular Expression in French**

★3 (fi 6) (either term, 3-0-0). Prerequisites or corequisites: FREN 251 and 252, or 257.

**FREN 344 Literature and Society in French**

★3 (fi 6) (either term, 3-0-0). Prerequisite or corequisite: FREN 301.

**FREN 345 Essay and Idea in French**

★3 (fi 6) (either term, 3-0-0). Prerequisite or corequisite: FREN 301.

**FREN 346 Women Writing in French**

★3 (fi 6) (either term, 3-0-0). Prerequisite or corequisite: FREN 301.

**FREN 351 Advanced Grammar**

★3 (fi 6) (either term, 3-0-0). Prerequisites: FREN 251 and 252, or 257. Note: Not open for credit to students having credit in FREN 350 or FRANC 264.

**FREN 352 Composition, Style, and Expression**

★3 (fi 6) (either term, 3-0-0). Prerequisites: FREN 251 and 252, or 257. Note: Not open for credit to students having credit in FREN 350 or FRANC 267.

**Q FREN 353 Translation: French into English**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: FREN 251 and 252, or 257. Note: Not open for credit to students having credit in FREN 415.

**Q FREN 361 Introduction to Quebec/French-Canadian Studies**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite or corequisite: FREN 301.

**Q FREN 364 Cultural Practices of Quebec and French Canada**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: FREN 251 and 252, or 257. Note: Not open for credit to students having credit in FR CA 300 or CA FR 350.

**Q FREN 372 French Phonetics**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: Either FREN 251 and 252, or FREN 257. Note: Not open for credit to students having credit in R LIN 372.

**Q FREN 375 The Grammatical Structure of French: Word to Phrase; Phrase to Sentence**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: FREN 276 or consent of Department. Note: Not open for credit to students having credit in R LIN 375.

**Q FREN 390 Introduction to Children's Literature in French**

★3 (*fi 6*) (either term, 3-0-1). A survey of children's literature in French, especially designed for future teachers of French. Prerequisite: Any 200- or 300-level French or French-Canadian courses except the 200-level reading courses.

**FREN 432 Topics in Francophone Cultural Practices**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: FREN 333.

**FREN 442 Text in Context in French**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: FREN 301.

**FREN 443 Problems in French Literary Studies**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: FREN 301.

**FREN 454 Translation: English into French**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: FREN 351 or 352. Note: Not open for credit to students having credit in FREN 416.

**FREN 455 Comparative Stylistics I**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: FREN 454 or consent of Department. Note: Not open for credit to students having credit in FREN 400.

**FREN 456 Comparative Stylistics II**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: FREN 455 or consent of Department. Note: Not open for credit to students having credit in FREN 400.

**FREN 468 Topics in Quebec/French Canadian Studies**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: FREN 301.

**FREN 469 Literature and Society in Quebec/French Canadian Studies**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: FREN 301.

**Q 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 499 Directed Reading**

★3-6 (*variable*) (variable, 3-0-0). Designed to meet the needs of individual students. Prerequisite: consent of Department.

**FREN 520 Honors Thesis**

★3 (*fi 6*) (variable, variable). For fourth-year Honors students. Prerequisite: consent of Department.

**Graduate Courses****FREN 500 Reading Course**

★3-6 (*variable*) (two term, 3-0-0). This course is for graduate students who wish to satisfy the language requirement of their Department. Note: Not open to undergraduates.

**FREN 505 Theories of Second Language Acquisition**

★3 (*fi 6*) (either term, 3-0-0). The objective of this course is to familiarize students with recent research on second language acquisition in order to provide them with a better understanding of the processes involved in learning a second language. Topics to be discussed are Contrastive Analysis, Error Analysis, Learner Strategies, Critical Period, L2 Variation, UG approaches, Language Attrition and Immersion Learning. Pedagogical ramifications and applications of theoretical discussion will also be discussed.

**FREN 515 Intermediate Exercises in Translation: French into English**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: FREN 415. Prerequisite or corequisite: FREN 400.

**FREN 516 Intermediate Exercises in Translation: English into French**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: FREN 416. Prerequisite or corequisite: FREN 400.

**FREN 525 Studies in Forms and Genres in French Literature**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: consent of Department.

**FREN 526 Studies in French Literary Theory and Criticism**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: consent of Department.

**FREN 529 Studies in Francophone Literature Outside France**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: consent of Department.

**FREN 555 Teaching Strategies for Postsecondary Language Instructors of French**

★3 (*fi 6*) (first term, 3-0-0). Designed to help graduate teaching assistants develop practical expertise in the instruction of French at the college and university levels.

**FREN 560 Studies in 18th-Century French Literature**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: consent of Department.

**FREN 585 Studies in 20th-Century French Thought**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: consent of Department.

**FREN 599 Directed Reading**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: consent of Department.

**FREN 600 Translation Theories: French-English; English-French**

★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**

★3-6 (*variable*) (variable, 3-0-0).

**FREN 626 Seminar in French Literary Criticism**

★3-6 (*variable*) (variable, 0-3s-0).

**FREN 627 Seminar in the French Novel**

★3-6 (*variable*) (variable, 3-0-0).

**FREN 662 Seminar in 18th-Century Literature**

★3-6 (*variable*) (variable, 0-3s-0).

**FREN 690 Master's Seminar in French**

★6 (*fi 12*) (two term, 0-3s-0). Note: Open only to students registered in the course-based MA in French/French-Canadian Literature.

**FREN 696 Studies in Individual Authors**

★3-6 (*variable*) (variable, 3-0-0).

**FREN 697 Special Reading Course**

★3-6 (*variable*) (variable, 3-0-0).

**FREN 699 Conference Course**

★3-6 (*variable*) (variable, 3-0-0).

**FREN 900 Directed Research Project**

★6 (*fi 12*) (variable, variable).

**201.105 Genetics (Biological Sciences), GENET**

Department of Biological Sciences  
Faculty of Science

**Note:** See the following sections for listings of other Biological Sciences courses: Biology (BIOL); Botany (BOT); Entomology (ENT); Microbiology (MICRB); Zoology (ZOO).

**Undergraduate Courses****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.

**GENET 275 The Genetics of Higher Organisms**

★3 (*fi 6*) (either term, 3-0-0). A comprehensive survey of the principles of genetics of eukaryotes. Gene structure and function; Mendelian genetics; cytoplasmic inheritance; cytogenetics; biochemical genetics; somatic cell genetics. Emphasis will be placed on examples from human genetics. Prerequisite: BIOL 207.

**GENET 301 Organization of Simple Genomes**

★3 (*fi 6*) (first term, 3-0-0). The organization, behavior dynamics and expression of the genetic material in simple model systems from the point of view of its function in the transmission of hereditary information. Prerequisite: GENET 270.

**GENET 302 The Eukaryotic Nucleus**

★3 (*fi 6*) (second term, 3-0-0). A structure/function analysis of the nature of the eukaryotic nucleus: Kinetic and informational complexity of DNA; chromatin and gene action; the nucleolus; the nuclear matrix; the nuclear membrane; chromosomes in mitosis and meiosis; the spindle; regulation of the cell cycle. Prerequisites: GENET 275, 270 recommended.

**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 which regulate the operation of particular genes. Prerequisite: GENET 270.

**GENET 364 Plant Genetics**

★3 (fi 6) (first term, 3-1s-0). A survey of genetic phenomena unique to or characteristic of higher plants, with emphasis on explanation at the molecular level. The relationship between molecular or somatic cell genetics and plant breeding will be discussed. Prerequisite: GENET 270.

**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 biology. These will include cytogenetics, recombinant DNA techniques, and methods of genome analysis. Prerequisites: GENET 270, 275, MICRB 265, and a 300-level GENET course. Enrolment is limited, and registration is by permission of the Department.

**GENET 390 Gene Manipulation**

★3 (fi 6) (first term, 3-0-0). In vitro manipulation of genes with an emphasis on applications to biotechnology. Bacterial, yeast, plant, and animal vector systems. Enzymology of DNA manipulation. Electrophoresis of nucleic acids and proteins. Hybridization techniques for the identification of nucleic acids and proteins. Hybridization techniques for the identification of nucleic acid sequences. cDNA and genomic DNA cloning and screening. In vitro mutagenesis. Prerequisite: GENET 270. Prerequisite or corequisite: BIOCH 203 and 205.

**GENET 408 Replication, Repair, and Recombination**

★3 (fi 6) (first term, 3-1s-0). DNA replication, repair, and recombination in prokaryotes and eukaryotes. Origins of DNA variation by mutation. Prerequisites: GENET 301 and 302. Note: This course is normally recommended for fourth-year students.

**GENET 412 Genetic Control of 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. Prerequisites: GENET 302 or 304.

**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. Chromosomal abnormalities, cancer cytogenetics, population genetics, DNA polymorphisms linked to diseases, gene mapping, applications to genetic counselling, ethical issues. Prerequisites: GENET 302. BIOL 380 strongly recommended.

**GENET 420 Research Techniques in Molecular Genetics**

★6 (fi 12) (either term, 0-0-12). A laboratory course emphasizing modern techniques in bacterial and phage genetics, restriction analysis of DNA, and plasmid construction by in vitro recombinant DNA techniques. Prerequisites: GENET 301 and 390. GENET 375 recommended. Enrollment is limited and registration is by permission of the Department. Designed for undergraduate and graduate students in programs with molecular biological orientation.

**Graduate Courses****Notes**

- (1) All 300- and 400-level courses in the Department of Biological Sciences may be taken for credit 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, 540, 541, 550, 555, 560; CHEM 361, 363, 461; CELL 300, 301; INT D 371, 372, 421, 452, 455, 464, 543, 544, 545, 551; MA SC 400, 401, 402, 410, 412, 420, 425, 430, 437, 440, 445, 450, 454, 470, 480; MMI 350, 405, 415, 516, 520; NEURO 472, 503; NU FS 363; PALEO 318, 319; 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). DNA replication, repair, and recombination in prokaryotes and eukaryotes. Origins of DNA variation by mutation. Prerequisites: GENET 301 and 302 and consent of Department.

**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 Graduate Course in Genetic Control of 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. Prerequisites: GENET 302 and 304 and consent of Department.

**GENET 518 Graduate Course in Human Genetics**

★3 (fi 6) (second term, 3-1s-0). A survey of human genetic variation and mutation in a molecular genetics context. Chromosomal abnormalities, cancer cytogenetics, population genetics, DNA polymorphisms linked to disease, gene mapping, applications to genetic counseling, ethical issues. Prerequisites: GENET 302. BIOL 380 strongly recommended. Consent of Department.

**GENET 601 Genetics Seminars**

★1 (fi 2) (either term, 0-1s-0).

**GENET 605 Invited Speaker Seminar Series**

★1 (fi 2) (either term, 0-1s-0).

**201.106 Géographie, GEOGE**

Faculté Saint-Jean

**Cours de 1er cycle****201.106.1 Domaine des Arts****GEOGE 130 Introduction à la géographie physique I**

★3 (fi 6) (premier semestre, 3-0-3). Introduction à la géomorphologie. Analyse structurale des formes du relief terrestre et étude de leur évolution sous l'influence des conditions morpho-climatiques. Travaux pratiques. Ne peut être pris par les étudiants qui ont des crédits en GEOGE 201. Anciennement GEOGE 230.

**GEOGE 150 Organisation de l'activité humaine en fonction de l'espace**

★3 (fi 6) (premier semestre, 3-0-0). Recherche d'un ordre dans l'occupation de la terre par l'homme et dans la distribution humaine sur terre; les cartes vues en tant que techniques pour comprendre la réalité. Anciennement GEOGE 250.

**GEOGE 151 Introduction à la géographie culturelle**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Signification de la distribution humaine sur la terre. Les relations de l'homme avec son milieu physique; problèmes de la population mondiale; les différentes cultures à travers le monde. Anciennement GEOGE 251.

**GEOGE 281 Géographie de la ville**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Origine et extension de l'urbanisation. Problèmes de la croissance dans les zones urbaines et dans les systèmes interurbains. Anciennement GEOGE 381.

**GEOGE 354 Géographie de la population**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Structures spatiales, caractéristiques démographiques et culturelles. Leur évolution. Répartition, densité, structures internes, mobilité et croissance de la population étudiées en fonction des diverses situations économiques et sociales.

**201.106.2 Domaine des Sciences****GEOGE 131 Introduction à la géographie physique II**

★3 (fi 6) (deuxième semestre, 3-0-3). Notions de climatologie et de biogéographie. Les climats, les sols et la végétation; étude de leurs combinaisons en divers milieux bioclimatiques. Travaux pratiques. Ne peut être pris par les étudiants qui ont des crédits en GEOGE 201. Anciennement GEOGE 231.

**201.107 Géologie, GEOLE**

Faculté Saint-Jean

**Cours de 1er cycle****GEOLE 102 Géologie physique**

★3 (fi 6) (premier semestre, 3-0-3). Structure interne et composition de la terre; continents et océans; roches et minéraux; eaux souterraines et approvisionnement en eau, érosion, transport et dépôt de sédiments; activité éruptive et métamorphisme; formation des montagnes; structures tectoniques. Ce cours n'est pas accessible aux étudiants ayant obtenu des crédits en GEOL 201 ou 290. Anciennement GEOLE 202.

**GEOLE 103 La terre et la vie à travers les âges**

★3 (fi 6) (deuxième semestre, 3-0-3). Les processus géologiques et biologiques



applicables à la géologie historique; la géologie structurale et les plaques tectoniques, la datation relative et numérique, l'analyse des faciés et corrélation, les fossiles, l'évolution de la vie. La géologie historique à partir de la formation du système solaire jusqu'à récemment: le début des planètes, l'origine et le développement des chaînes de montagne et bassins sédimentaires; principaux dépôts sédimentaires et gisements miniers; principaux groupes de fossiles, répertoire des fossiles, groupes disparus et radiations. Prerequisite: GEOLE 102. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour GEOL 204. Anciennement GEOL 203.

## 201.108 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.

### Undergraduate Courses

#### **GEOPH 221 Physics of the Earth**

★3 (fi 6) (second term, 3-0-0). The Earth in the solar system; elements of seismology and properties of the Earth's interior; gravity and the shape of the Earth; geomagnetism and plate tectonics; atmospheric and space physics and Sun-Earth interactions; introduction to applications of geophysical methods in environmental monitoring, mineral and petroleum exploration. Prerequisite: MATH 101, 115 or 118, and PHYS 101, 102, 109 or EN PH 131.

#### **GEOPH 223 Environmental Monitoring and Mining Exploration Techniques**

★3 (fi 6) (first term, 3-0-3). Near surface geophysical techniques; shallow seismic, gravity, radiometric, electrical and electromagnetic methods; environmental monitoring; rock properties; the effect of contaminants on rock properties. Prerequisites: MATH 101, 115 or 118, and PHYS 101, 102, 109, or EN PH 131. Note: Not available to students in Honors or Specialization Physics or Geophysics.

#### **GEOPH 224 Geophysical Exploration Techniques**

★3 (fi 6) (second term, 3-0-3). Seismic wave propagation; the geological interpretation of seismic reflection and refraction; seismic data processing; the principles of well logging; gravitational and magnetic techniques. Prerequisites: MATH 101, 115 or 118, and PHYS 101, 102, 109 or EN PH 131. Note: Not available to students in Honors or Specialization Physics or Geophysics.

#### **GEOPH 325 Gravity, Magnetic, and Electrical Techniques**

★3 (fi 6) (either term, 3-0-0). Elementary potential theory as required for gravity, magnetic, electrical, and electromagnetic studies of shallow and deep geological structures; background to pertinent geophysical measurements and to the magnetic, gravitational, and electrical properties of dry and fluid saturated rocks and soils; applications in environmental monitoring and mineral exploration; instrumentation; introduction to the use of computers in the analysis of large geophysical data sets. Prerequisite: PHYS 281 or 285.

#### **GEOPH 326 Refraction and Reflection Seismology**

★3 (fi 6) (either term, 3-0-0). Use of seismic reflection and refraction methods for petroleum and mineral exploration and environmental monitoring; basic elasticity theory and seismic velocities in earth materials; introduction to seismic imaging, corrections to seismic data, instruments for seismic data acquisition; interpretation of seismic data. Prerequisite: PHYS 281 or 285.

#### **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; major components of the seismic field: body waves (including head waves, surface waves, and normal modes: ray approaches as high frequency approximations to the seismic field; source mechanisms; structure of the Earth; seismometers; inversion of seismic data. Pre- or corequisite: MATH 337. Prerequisite: PHYS 281 or 285, GEOPH 326.

#### **GEOPH 424 Electromagnetic and Potential Field Methods**

★3 (fi 6) (either term, 3-0-0). Potential theory as applied to gravity, magnetic, and electrical studies; interpretation of field data; theory and application of Maxwell's equations; forward and inverse techniques to obtain model structures. Pre- or corequisite: MATH 337. Prerequisite: PHYS 281 or 285, GEOPH 325.

#### **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; continuation of potential fields; migration and imaging of seismic data sets; application of computers in assignments. Pre- or corequisites: MATH 311 and GEOPH 326. Prerequisite: ★3 in Computing Science.

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

★3 (fi 6) (either term, 3-0-0). 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. Prerequisite or corequisite: PHYS 381.

#### **GEOPH 437 Application of Methods in Environmental and Exploration Geophysics**

★3 (fi 6) (either term, 0-0-6). A field trip held before and during the fall term provides electrical, electromagnetic, gravitational, and magnetic data sets for analysis; the data acquired are processed, modelled, and interpreted by the student in a computer workstation laboratory; final results are presented in the form of professional technical reports. Prerequisite: MATH 209, 214, or equivalent. Corequisite: GEOPH 325. Strongly recommended: ★3 in Computing Science.

#### **GEOPH 438 Aspects of Seismic Data Processing**

★3 (fi 6) (either term, 0-0-6). A previously acquired seismic data set will be corrected, enhanced, and imaged in a computer workstation laboratory. Results obtained by the student will be presented in the format of a series of professional technical reports. Prerequisite: MATH 209, 214, or equivalent. Corequisite: GEOPH 326. Strongly recommended: ★3 in Computing Science.

### Graduate Courses

The following undergraduate courses may be taken for credit by graduate students: GEOPH 421, 424, 426, 429, 437, 438.

#### **GEOPH 521 Plate Tectonics and Global Dynamics**

★3 (fi 6) (either term, 2-1s-0). Spherical kinematics; plate accretion and subduction; transform faults; seismic energy at plate boundaries; geomagnetic reversals and sea-floor spreading; polar wander and continental drift; the Earth's core; thermal energy at plate boundaries and hot-spots: rheology of the lithosphere and asthenosphere; mantle convection; the Earth's electrical structure. Prerequisite or corequisite: GEOPH 421 or consent of Instructor.

#### **GEOPH 612 Paleomagnetism**

★3 (fi 6) (either term, 3-0-0).

#### **GEOPH 616 Tectonic Theories**

★3 (fi 6) (either term, 3-0-0).

#### **GEOPH 620 Rock Physics**

★3 (fi 6) (either term, 3-0-0).

#### **GEOPH 623 Time Sequence Analysis**

★3 (fi 6) (either term, 3-0-0).

#### **GEOPH 624 Theoretical Seismology**

★3 (fi 6) (either term, 3-0-0).

#### **GEOPH 625 Physics of Macroscopic Mixtures**

★3 (fi 6) (either term, 3-0-0).

#### **GEOPH 628 Topics in Solar-terrestrial Relationships**

★3 (fi 6) (either term, 3-0-0).

#### **GEOPH 629 Advanced Topics in Plasma and Space Physics I**

★3 (fi 6) (either term, 3-0-0).

#### **GEOPH 632 Geomagnetism**

★3 (fi 6) (either term, 3-0-0).

#### **GEOPH 634 Advanced Seismology**

★3 (fi 6) (either term, 3-0-0).

## 201.109 German, GERM

Department of Modern Languages and Cultural Studies:  
Germanic, Romance, Slavic  
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, or they may be encouraged to seek "Credit by Special Assessment" (see §44.5) where 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 course, credit may be withheld.

- (4) See also INT D 350 and 519 for courses which are offered by more than one department or Faculty and which may be taken as an option or as a course in this discipline.
- (5) See also Scandinavian listings.

## Undergraduate Courses

### **G** GERM 100 Beginners' German

★6 (*fi 12*) (two term, 3-0-2). Designed to lead to mastery of spoken and written German. Note: Not open to students who have successfully completed German 30, GERM 101, or GERM 165.

### **G** GERM 150 First-Year University German

★6 (*fi 12*) (two term, 3-0-2). Designed to develop ability in speaking, reading, and writing German, using modern short stories, cultural readers, and audio-visual aids. Prerequisite: German 30, GERM 100, or the equivalent. Formerly GERM 200.

### **G** 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 available to students who have successfully completed German 30, or GERM 100, or 101. Formerly GERM 215.

### **G** GERM 264 Introduction to German Culture in a European Context

★3 (*fi 6*) (either term, 3-0-0). An introduction to basic questions of culture in Germany, to its European connections, and historical foundations as reflected in a series of prominent examples from the Middle Ages to the present.

### **G** 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. Note: Students who pass GERM 265 with a grade of 6 or better will be considered by the Department as having fulfilled the reading requirement for German for the PhD at the University of Alberta. Prerequisite: German 30, GERM 100, 101, 165 or their equivalents. Formerly GERM 315.

### **G** GERM 301 Advanced Grammar and Stylistics

★6 (*fi 12*) (two term, 3-0-0). Theoretical and practical study of the more complex areas of German grammar, style, and idiomatic usage. Prerequisites: GERM 150 or consent of Department. Note: Not to be taken after completion of any 400-level German course except with special departmental permission.

### GERM 306 German-English Contrastive Phonology

★3 (*fi 6*) (first term, 3-0-0). Phonetic and phonemic analysis of English and German. Contrastive study includes application to teaching and learning. Prerequisite: GERM 150 or consent of Department. Note: This course will not fulfil the Language other than English requirement of the BA degree and cannot be used to fulfil the senior Social Sciences requirement of the BA degree by students with a major or second subject offered by the Department of Germanic Languages.

### GERM 307 German-English Contrastive Grammar: The Verbal System

★3 (*fi 6*) (second term, 3-0-0). Comparison of form and function of the verbal system including syntactic features. Prerequisite: GERM 150 or consent of Department. Note: This course will not fulfil the Language other than English requirement of the BA degree and cannot be used to fulfil the senior Social Sciences requirement of the BA degree by students with a major or second subject offered by the Department of Germanic Languages.

### GERM 308 German-English Contrastive Grammar: The Nominal System

★3 (*fi 6*) (second term, 3-0-0). Comparison of form and function of the noun, its substitutes and modifiers. Prerequisite: GERM 150 or consent of Department. Note: This course will not fulfil the Language other than English requirement of the BA degree and cannot be used to fulfil the senior Social Sciences requirement of the BA degree by students with a major or second subject offered by the Department of Germanic Languages.

### GERM 311 Business German I: Financial and Marketing Aspects

★3 (*fi 6*) (first term, 3-0-0). Readings, discussions, and exercises dealing with the financial and marketing aspects of German business, e.g. advertisements, marketing, banking, postal service, telecommunications. Prerequisite: GERM 150 or consent of Department. Not to be taken by students with credit in GERM 310.

### GERM 312 Business German II: Organizational and Legal Aspects

★3 (*fi 6*) (second term, 3-0-0). Readings, discussions, and exercises dealing with the organizational and legal aspects of German business, e.g. trade, industry, currency, taxes, social security system, budget. Prerequisite: GERM 150 or consent of Department. Completion of GERM 311 is recommended. Not to be taken by students with credit in GERM 310.

### GERM 316 Introduction to German Applied Linguistics I: Theoretical Aspects

★3 (*fi 6*) (first term, 3-0-0). Discussion of concepts in multilingualism, contrastive analysis, sociolinguistics, and pragmalinguistics as related to the study of German. Prerequisite: GERM 150 or consent of Department.

### GERM 317 Introduction to German Applied Linguistics II: Practical Aspects

★3 (*fi 6*) (second 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 150 or consent of Department.

### **G** GERM 321 Modern German Prose: Nietzsche to Kafka

★3 (*fi 6*) (either term, 3-0-0). Prose works by major German authors from the late 19th and early 20th century in translation. Intended to introduce students both to prominent themes and developments and to methods of literary criticism. Lectures, discussions, and papers in English.

### **G** GERM 322 Modern German Drama: Brecht to Dürrenmatt

★3 (*fi 6*) (either term, 3-0-0). Major German dramas in translation from the early 20th century to the present. Intended to introduce students both to prominent themes and developments and to methods of literary criticism. Lectures, discussions, and papers in English.

### GERM 331 German Culture and Civilization to the 18th Century

★3 (*fi 6*) (first term, 3-0-0). This survey course deals with highlights of German culture and civilization from Germanic times to the end of the 18th century. Prerequisite: GERM 150 or consent of Department. Not to be taken by students with credit in GERM 330.

### GERM 332 German Culture and Civilization from 1806 to 1949

★3 (*fi 6*) (second term, 3-0-0). This survey course covers the social, cultural, and political history of Germany from the collapse of the Holy Roman Empire in 1806 to the collapse of the "Tausendjährige Reich". Prerequisite: GERM 150 or consent of Department. Not to be taken by students with credit in GERM 330.

### GERM 341 German Culture and Civilization from 1945 to 1969

★3 (*fi 6*) (either term, 3-0-0). Lectures, readings, and discussions of texts relating to the cultural history of the German-speaking countries between the end of World War II and 1969. Prerequisite: GERM 150 or consent of Department. Note: Not to be taken by students with credit in GERM 340.

### GERM 342 German Culture and Civilization after 1969

★3 (*fi 6*) (either term, 3-0-0). Lectures, readings, and discussions of texts relating to the cultural history of the German-speaking countries between 1969 and the present. Prerequisite: GERM 150 or consent of Department. Note: Not to be taken by students with credit in GERM 340.

### GERM 351 Introduction to German Literary and Cultural Studies I

★3 (*fi 6*) (first term, 3-0-0). This course deals with highlights of the German literary and cultural development on the basis of textual examples from Germanic times to the 18th century. Prerequisite: GERM 150 or consent of the Department. Note: Not to be taken by students with credit in GERM 350 or GERM 498 A1 taken in 1994-95.

### GERM 352 Introduction to German Literary and Cultural Studies II

★3 (*fi 6*) (second term, 3-0-0). This course deals with highlights of German literary and cultural development on the basis of textual examples from German Classical Weimar to the present. Prerequisites: GERM 150 or consent of Department. Note: Not to be taken by students with credit, in GERM 350 or GERM 498 B2 taken in 1994-95.

### GERM 406 Introduction to Germanic Linguistics

★3 (*fi 6*) (first term, 3-0-0). The Germani. Runes, sound shifts and other major features of Germanic languages with emphasis on German. Prerequisite or corequisite: One of GERM 306, 316, 317, or consent of Department.

### GERM 407 History of New High German

★3 (*fi 6*) (either term, 3-0-0). Origin and development of modern standard German. Prerequisite: One of GERM 306, 316, 317, or consent of Department.

### GERM 408 Studies in German Grammar

★3 (*fi 6*) (either term, 3-0-0). Discussion of controversial topics in German pronunciation and grammar. Prerequisite: GERM 306 and one of GERM 307, 308, 316, 317, or consent of Department.

### 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 411 Middle High German I

★3 (*fi 6*) (first term, 3-0-0). An introduction to the grammar of Middle High German and to selected literary texts. Prerequisites: GERM 351, plus one of 331, 332, 341, 342, or 352, or consent of Department.

### GERM 412 Middle High German II

★3 (*fi 6*) (second term, 3-0-0). Study of selected literary texts of classical Middle High German. Prerequisite: GERM 411, or consent of Department.

### GERM 416 German Applied Linguistics I: Learning German as a Second/Foreign Language

★3 (*fi 6*) (first 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, 307, 308, 316, 317, or consent of Department.

**GERM 417 German Applied Linguistics II: The Social Context for Using German as a First/Second/Foreign Language**

★3 (fi 6) (second 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, 307, 308, 316, 317, 416, or consent of Department.

**GERM 425 Literature of the German Enlightenment**

★3 (fi 6) (either term, 3-0-0). After a survey of the political and cultural history of the time and the philosophical ideas of German Enlightenment Aufklärung, representative works of the period by such authors as Gottsched, Johann Elias Schlegel, Gellert, and Wieland are discussed with particular emphasis on the works of Lessing. Prerequisites: GERM 352, plus one of 331, 332, 341, 342, or 351, or consent of Department.

**GERM 426 Literature of the German Sturm und Drang**

★3 (fi 6) (either term, 3-0-0). This course deals with a unique German literary movement. It discusses the background and theories of the Sturm und Drang period and covers representative works of Herder, Gerstenberg, Hamann, Lenz, Leisewitz, as well as the young Goethe and Schiller. Prerequisites: GERM 352, plus one of 331, 332, 341, 342, or 351, or consent of Department.

**GERM 430 German Classicism**

★1-12 (variable) (variable, 3-0-0). The ideas and literature of German Classicism. Special emphasis on the works of Goethe and Schiller. Prerequisites: GERM 352, plus one of 331, 332, 341, 342, or 351, or consent of Department.

**GERM 436 Later German Romanticism**

★3 (fi 6) (either term, 3-0-0). A survey of major theoretical and poetic works by writers of the later romantic period: Brentano, Hoffman, Eichendorff, Kleist, and Heine, with special attention to the short story and to lyric poetry. Prerequisites: GERM 352, plus one of 331, 332, 341, 342, or 351, or consent of Department.

**GERM 441 Exercises in 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 301 or consent of Department.

**GERM 442 Exercises in Translation: English into German**

★3 (fi 6) (either term, 3-0-0). Practice of translations of texts from modern English literature. Prerequisite: GERM 301 or consent of Department.

**GERM 453 Modern German Literature**

★3-6 (variable) (variable, 3-0-0). German literature since Naturalism: Impressionism, Expressionism, and literature up to 1945 with interpretation of representative works. Prerequisites: GERM 352, plus one of 331, 332, 341, 342, or 351, or consent of Department. Note: Not to be taken by students with credit in GERM 451 or 452.

**GERM 460 Studies in a Genre**

★3-6 (variable) (variable, 3-0-0). Prerequisites: GERM 352 plus one of 331, 332, 341, 342, or 351, or consent of Department.

**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 352, plus one of 331, 332, 341, 342, or 351, 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 352, plus one of 331, 332, 341, 342, or 351, or consent of Department. Note: Not to be taken by students with credit in GERM 448 or 457.

**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 352, plus one of 331, 332, 341, 342, or 351, or consent of Department. Note: Not to be taken by students with credit in GERM 448 or 457.

**GERM 480 Studies in German Prose I**

★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 352, plus one of 331, 332, 341, 342, or 351, or consent of Department. Note: Not to be taken by students with credit in GERM 449 or 456.

**GERM 481 Studies in German Prose II**

★3 (fi 6) (either term, 3-0-0). Major developments in German prose since the late 19th century, with special attention to representative modern and contemporary writers. Prerequisites: GERM 352, plus one of 331, 332, 341, 342, or 351, or consent of Department. Note: Not to be taken by students with credit in GERM 449 or 456.

**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 352, plus one of 331, 332, 341, 342, or 351, 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 352, plus one of 331, 332, 341, 342, or 351, or consent of Department.

**GERM 497 Special Topics in Germanic Linguistics and Philology**

★3-6 (variable) (variable, 3-0-0). Prerequisite: consent of Department.

**GERM 498 Special Topics in German Literature**

★3-6 (variable) (variable, 3-0-0). Prerequisite: consent of Department.

**GERM 504 Directed Readings for Fourth-Year Honors Students**

★3 (fi 6) (either term, 0-3s-0).

**GERM 505 Honors Essay**

★3 (fi 6) (second term, 0-3s-0). Required of fourth-year Honors students (except those in the Combined Honors program) and prepared under the supervision of a member of the Department.

**Graduate Courses****GERM 501 Reading Course: Grammar**

★3 (fi 6) (first term, 3-0-0). This course is designed for graduate students who wish to satisfy the language requirement for their department. An intensive study of essential grammar and translation of graded texts. Note: Not open to undergraduates.

**GERM 502 Reading Course: Tutorials**

★3 (fi 6) (second term, 3-0-0). These tutorials are designed for graduate students who have acquired the necessary knowledge of grammar and translation skills but require preparation for the proficiency examination to satisfy the language requirements for their department. Prerequisite: GERM 501 or consent of Department. Note: Not open to undergraduates.

**GERM 506 German-English Contrastive Phonology**

★3 (fi 6) (either term, 3-0-0).

**GERM 507 German-English Contrastive Grammar: The Verbal System**

★3 (fi 6) (either term, 3-0-0).

**GERM 509 Introduction to Germanic Linguistics**

★3 (fi 6) (either term, 3-0-0).

**GERM 510 History of New High German**

★3 (fi 6) (either term, 3-0-0).

**GERM 513 Studies in German Grammar**

★3 (fi 6) (either term, 3-0-0).

**GERM 514 German Dialects**

★3 (fi 6) (either term, 3-0-0).

**GERM 516 German Applied Linguistics I: Using German as a First/Second/Foreign Language**

★3 (fi 6) (either term, 3-0-0). This course deals with German text linguistics and pragmalinguistics. The focus will be on text analyses concerning specific text markers, characteristics, and intentions. The main topics of intercultural Germanistik will be discussed.

**GERM 517 German Applied Linguistics II: Theory and Practice of Teaching German as a Second/Foreign Language**

★3 (fi 6) (either term, 3-0-0). This course surveys theories about the principles and processes in teaching German language, literature, culture, and civilization to adults. The students will be introduced to several theories of grammar, with an emphasis on pedagogical grammars.

**GERM 518 German Applied Linguistics I: Learning German as a Second/Foreign Language**

★3 (fi 6) (either term, 3-0-0).

**GERM 519 German Applied Linguistics II: The Social Context for Using German as a First/Second/Foreign Language**

★3 (fi 6) (either term, 3-0-0).

**GERM 526 Literary and Cultural Theories**

★3 (fi 6) (either term, 3-0-0). Introduction to contemporary theories of literary and cultural studies.

**GERM 531 Middle High German I**

★3 (variable) (either term, 3-0-0).

**GERM 532 Middle High German II**

★3 (fi 6) (either term, 3-0-0).

**GERM 550 Gothic**

★3 (fi 6) (either term, 3-0-0).

**GERM 555 Teaching Strategies for Postsecondary Language Instructors of German**

★3 (fi 6) (first term, 3-0-0). Designed to help graduate teaching assistants to develop practical expertise in the instruction of German at the college and university levels.

**GERM 590 Old Saxon**

★3 (fi 6) (either term, 3-0-0).

**GERM 593 Bibliography and Methods of Literary Scholarship**

★3 (fi 6) (first term, 3-0-0).

**GERM 604 Studies in Middle High German Lyric Verse**

★3 (fi 6) (either term, 3-0-0).

**GERM 605 The Nibelungenlied**

★3 (fi 6) (either term, 3-0-0).

**GERM 606 Hartmann von Aue**

★3 (fi 6) (either term, 3-0-0).

**GERM 607 Wolfram von Eschenbach**

★3 (fi 6) (either term, 3-0-0).

**GERM 609 Gottfried von Strassburg**

★3 (fi 6) (either term, 3-0-0).

**GERM 617 Lessing**

★3 (fi 6) (either term, 3-0-0).

**GERM 618 Enlightenment**

★3 (fi 6) (either term, 3-0-0).

**GERM 622 Goethe**

★3 (fi 6) (either term, 3-0-0).

**GERM 624 Schiller**

★3 (fi 6) (either term, 3-0-0).

**GERM 625 Romanticism**

★3 (fi 6) (either term, 3-0-0).

**GERM 633 Drama of the 19th Century**

★3 (fi 6) (either term, 3-0-0).

**GERM 634 Prose of the 19th Century**

★3 (fi 6) (either term, 3-0-0).

**GERM 637 Naturalism**

★3 (fi 6) (either term, 3-0-0).

**GERM 665 Studies in the German Novel**

★3 (fi 6) (either term, 3-0-0).

**GERM 696 Conference Course in Germanic Linguistics and Philology**

★3-6 (variable) (variable, 3-0-0).

**GERM 697 Special Topics in Germanic Linguistics and Philology**

★3-6 (variable) (variable, 3-0-0).

**GERM 698 Special Topics in German Literature**

★3-6 (variable) (variable, 3-0-0).

**GERM 699 Conference courses**

★3-6 (variable) (variable, 3-0-0). Detailed study of an author, period, genre, or any literary problem not dealt with in the Honors or Graduate courses listed above. Designed to meet the needs of individual students.

**GERM 900 Directed Research Project**

★6 (fi 12) (variable, unassigned).

## 201.110 Greek, GREEK

Department of History and Classics  
Faculty of Arts

**Notes**

- (1) Prerequisite for all 400-level GREEK courses: GREEK 300 or 302, or consent of Department.
- (2) For additional related courses see Classics and Latin listings.

### Undergraduate Courses

**GREEK 101 Beginners' Greek I**

★3 (fi 6) (either term, 3-0-1). An introduction to Classical Greek which includes the study of the elements of Greek grammar and the reading of simple texts. Not open to students with credit in matriculation-level Greek or GREEK 100.

**GREEK 102 Beginners' Greek II**

★3 (fi 6) (either term, 3-0-1). An continuation of GREEK 101. Prerequisite: GREEK 101 or consent of Department. Not open to students with credit in GREEK 100.

**GREEK 103 Intensive Beginning Greek**

★6 (fi 12) (two term, 3-0-2). An introduction to Ancient Greek, including the elements of Greek grammar and the reading of simple texts. Not open to students with credit in matriculation Greek or who have successfully completed GREEK 100, or GREEK 101 or 102. Normally offered during Spring/Summer only.

**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 100 or 102, or consent of Department. Not open to students with credit in GREEK 300.

**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. Not open to students with credit in GREEK 300.

**GREEK 399 Readings in Greek Authors**

★3 (fi 6) (either term, 3-0-0). Prerequisite: GREEK 300 or 301, or consent of Department.

**GREEK 411 Greek Grammar and Style**

★3 (fi 6) (either term, 3-0-0). Readings from Greek authors and translation from English into Greek.

**GREEK 470 Greek Historians**

★3 (fi 6) (either term, 3-0-0).

**GREEK 474 Sophocles**

★3 (fi 6) (either term, 3-0-0). Note: Not open to students with credit in GREEK 374. Formerly GREEK 374.

**GREEK 475 Greek Drama**

★3 (fi 6) (either term, 3-0-0).

**GREEK 477 Greek Prose Authors (other than historians)**

★3 (fi 6) (either term, 3-0-0). Selections from Plato and Aristotle.

**GREEK 479 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 481 Greek Epic**

★3 (fi 6) (either term, 3-0-0).

**GREEK 488 Greek Authors I**

★3 (fi 6) (either term, 3-0-0).

**GREEK 489 Greek Authors II**

★3 (fi 6) (either term, 3-0-0).

**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 Greek Epic and Didactic Poetry**

★3 (fi 6) (either term, 3-0-0).

**GREEK 505 Greek Poetry**

★3 (fi 6) (either term, 3-0-0).

**GREEK 507 Greek Historiography**

★3 (fi 6) (either term, 3-0-0).

**GREEK 509 Greek Prose Writers**

★3 (fi 6) (either term, 3-0-0).

**GREEK 513 Topics in Greek Language**

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

**GREEK 551 Topics in Greek Literature**

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

**GREEK 599 Supervised Reading**

★3 (fi 6) (either term, 3-0-0).

**GREEK 699 Conference Course**

★3 (fi 6) (either term, 3-0-0).

## 201.111 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 Personal Health and Fitness

★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. Formerly HE ED 210.

### HE ED 220 Biological Basis of Health Promotion

★3 (fi 6) (either term, 3-0-0). A biological analysis of the contributions of physical activity to health. Emphasis on the examination of individual lifestyle behaviors and the biological and physiological consequences of those behaviors for health outcomes. Prerequisite: HE ED 110. Note: Credit will not be granted for both HE ED 220 and the former PESS 110.

### 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. For BPE students only. Prerequisites: PEDS 200 and PEDS 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 wellbeing. 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 or consent of the Faculty.

### 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 or consent of Faculty.

## 201.112 Hebrew, HEB

Department of Comparative Literature, Religion, and  
Film/Media 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 Hebrew 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, or they may be encouraged to seek "Credit by Special Assessment" (see §44.5) where appropriate.
- (3) The Department will withhold credit from students completing courses for which prior background is deemed ineligible to take. 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

### HEB 499 Problems and Topics in Hebrew Language and/or Literature

★3-6 (variable) (variable, 0-3s-0). Prerequisite: consent of Department.

## 201.113 Histoire, HISTE

Faculté Saint-Jean

### Cours de 1er cycle

#### **O** HISTE 120 Histoire du monde depuis le XVIII<sup>e</sup> siècle

★6 (fi 12) (aux deux semestres, 3-0-0). Cours de base du BA de 4 ans. Anciennement HISTE 220.

#### **O** HISTE 260 Introduction à l'étude de l'histoire du Canada de 1500 à 1867

★3 (fi 6) (premier semestre, 3-0-0). Conçu pour servir de base aux cours de niveau supérieur en histoire canadienne. Auparavant HISTE 278; ce cours n'est pas accessible aux étudiants ayant des crédits pour HISTE 278. Anciennement HISTE 360.

#### **O** HISTE 261 Introduction à l'étude de l'histoire du Canada de 1867 à nos jours

★3 (fi 6) (deuxième semestre, 3-0-0). Conçu pour servir de base aux cours de

niveau supérieur en histoire canadienne. Auparavant HISTE 279; ce cours n'est pas accessible aux étudiants ayant des crédits pour HISTE 279. Anciennement HISTE 361.

#### **O** HISTE 360 Choix de sujets en histoire du Canada

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0).

#### **O** HISTE 366 L'Ouest canadien depuis 1870

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0).

#### **O** HISTE 374 Le Canada français jusqu'à la Confédération

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). L'évolution du Canada français étudiée dans sa globalité: économie, société, vie politique.

#### **O** HISTE 375 Le Canada français depuis la Confédération

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). L'évolution du Canada français étudiée dans sa globalité: économie, société, vie politique.

#### **O** HISTE 380 La francophonie hors-Québec et son histoire

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). La formation et l'évolution des communautés francophones hors-Québec, de l'établissement de l'Acadie à nos jours. Anciennement HISTE 399.

#### **O** HISTE 397 Histoire de la science I

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction au développement de la science, du point de vue intellectuel, institutionnel et idéologique, d'Aristote à la Révolution scientifique. Note: ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour HUME 301; ni pour ceux ayant des crédits en HIST 304 jusqu'en 1989-90 ou HIST 396 de 1990-91 à aujourd'hui.

#### **O** HISTE 398 Histoire de la science II

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction au développement de la science, du point de vue intellectuel, institutionnel et idéologique, de Newton à nos jours. Note: ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour HUME 303; ni pour ceux ayant des crédits en HIST 304 jusqu'en 1989-90 ou HISTE 396 de 1990-91 à aujourd'hui.

#### **L** HISTE 460 Thèmes d'histoire du Canada

★3 (fi 6) (l'un ou l'autre semestre, 0-3s-0). Prerequis: 1 cours complet d'histoire du Canada.

#### **L** HISTE 470 Thèmes en histoire sociale canadienne

★3 (fi 6) (l'un ou l'autre semestre, 0-3s-0). Prerequis: un cours antérieur en histoire du Canada ou l'accord du Vice-doyen aux affaires académiques. Note: ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour HUME 402.

#### **L** HISTE 471 Thèmes en histoire intellectuelle canadienne

★3 (fi 6) (l'un ou l'autre semestre, 0-3s-0). Prerequis: un cours antérieur en histoire du Canada ou l'accord du Vice-doyen aux affaires académiques. Note: ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour HUME 402.

#### **L** HISTE 475 Thèmes d'histoire du Canada français au XX<sup>e</sup> siècle

★3 (fi 6) (l'un ou l'autre semestre, 0-3s-0). Plus particulièrement l'histoire de la francophonie hors-Québec. Prerequis: 1 cours complet d'histoire du Canada.

## 201.114 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 346, 475, and 498 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 take these courses are expected to have at least ★12 in History; if they do not, they must obtain the consent of Department prior to their registration, and the Department will consider their special needs. For some courses there are additional specified requirements.
- (3) HIST 110, 111, 112, and 120 are designed to provide a foundation for senior and advanced history courses, and also background for studies in related humanities and social sciences.

The following table lists renumbered courses effective 1990/91:

Old	New	Old	New
HIST 200	HIST 100	HIST 340	HIST 231
HIST 220	HIST 120	HIST 339	HIST 320
HIST 300	HIST 200	HIST 343	HIST 232

Old	New	Old	New
HIST 301	HIST 204	HIST 344	HIST 332
HIST 302	HIST 205	HIST 345	HIST 333
HIST 303	HIST 206	HIST 347	HIST 337
HIST 304	HIST 396	HIST 348	HIST 338
HIST 308	HIST 302	HIST 350	HIST 250
HIST 310	HIST 301	HIST 351	HIST 251
HIST 313	HIST 211	HIST 360	HIST 260
HIST 316	HIST 215	HIST 361	HIST 261
HIST 318	HIST 217	HIST 382	HIST 392
HIST 319	HIST 299	HIST 384	HIST 395
HIST 320	HIST 305	HIST 386	HIST 393
HIST 321	HIST 306	HIST 388	HIST 385
HIST 328	HIST 308	HIST 389	HIST 382
HIST 330	HIST 312	HIST 391	HIST 241
HIST 331	HIST 313	HIST 392	HIST 242
HIST 334	HIST 315	HIST 396	HIST 246
HIST 335	HIST 316	HIST 397	HIST 247
HIST 336	HIST 317	HIST 398	HIST 298
HIST 338	HIST 318	HIST 498	HIST 500

The following table lists renumbered courses effective 1991/92:

Old	New	Old	New
HIST 409	HIST 494	HIST 441	HIST 431
HIST 411	HIST 407	HIST 442	HIST 432
HIST 412	HIST 408	HIST 443	HIST 433
HIST 413	HIST 402	HIST 444	HIST 434
HIST 415	HIST 403	HIST 447	HIST 437
HIST 416	HIST 404	HIST 454	HIST 457
HIST 423	HIST 410	HIST 455	HIST 458
HIST 432	HIST 415	HIST 459	HIST 453
HIST 433	HIST 416	HIST 493	HIST 341
HIST 434	HIST 417	HIST 494	HIST 342
HIST 435	HIST 418	HIST 495	HIST 441
HIST 436	HIST 419	HIST 496	HIST 442
HIST 439	HIST 425	HIST 497	HIST 446
HIST 440	HIST 430		

## Undergraduate Courses

### **[O]** 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. Note: Students choosing HIST 110 for partial fulfilment of the Humanities Group A requirement must also take one of CLASS 110, HIST 111 or HIST 112.

### **[O]** HIST 111 The Early Modern World

★3 (*fi 6*) (either term, 3-0-0). World history from the 15th century through the 18th century. Note: Students choosing HIST 111 for partial fulfilment of the Humanities Group A requirement must also take one of CLASS 110, HIST 110, or HIST 112. Not open to students with credit in HIST 110 up to 1996-97.

### **[O]** HIST 112 The Modern World

★3 (*fi 6*) (either term, 3-0-0). The world since the beginning of the 19th century. Note: Students choosing HIST 112 for partial fulfilment of the Humanities Group A requirement must also take one of CLASS 110, HIST 110, or HIST 111. Not open to students with credit in HIST 120.

### **[O]** HIST 120 World History Since the 18th Century

★6 (*fi 12*) (two term, 3-0-0). Core course for the four-year BA.

### **[O]** HIST 202 Social and Economic History of Medieval Europe

★3 (*fi 6*) (either term, 3-0-0).

### **[O]** HIST 205 An Introduction to Modern Intellectual History

★3 (*fi 6*) (either term, 3-0-0). A survey of major trends in European intellectual history since the Enlightenment.

### **[O]** 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 Europe in the Central Middle Ages

★3 (*fi 6*) (either term, 3-0-0). Charlemagne to the 12th century. Not open to students with credit in HIST 200.

### **[O]** HIST 208 Europe in the Later Middle Ages

★3 (*fi 6*) (either term, 3-0-0). The 12th to the 15th century. Not open to students with credit in HIST 200.

### **[O]** HIST 209 Early Modern Europe

★3 (*fi 6*) (either term, 3-0-0). The Renaissance to the Enlightenment.

### **[O]** HIST 210 Europe in the 19th and 20th Centuries

★3 (*fi 6*) (either term, 3-0-0).

### **[O]** 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. Note: Not open to students with credit in HIST 230.

### **[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. Note: Not open to students with credit in HIST 230.

### **[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 238 The Second British Empire and the Commonwealth Experience in the 19th and 20th Century

★3 (*fi 6*) (either term, 3-0-0). Note: Not open to students with credit in HIST 349 prior to 1989-90.

### **[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.

### **[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 Revolution

★3 (*fi 6*) (either term, 3-0-0). African history since the 19th century.

### **[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 An Introduction to the Study of Canadian History 1500-1867

★3 (*fi 6*) (first term, 3-0-0). Note: Formerly HIST 278. Not open to students with credit in HIST 278.

### **[O]** HIST 261 An Introduction to the Study of Canadian History 1867 to the Present

★3 (*fi 6*) (second term, 3-0-0). Note: Formerly HIST 279. Not open to students with credit in HIST 279.

### **[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 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.

### **HIST 291 Computer Applications for Historians**

★3 (*fi 6*) (either term, 3-0-0). Use of the World-Wide Web (Internet), multimedia technologies and software application to enhance research skills for the historian.

### **[O]** 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.

### **[O]** 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.

### **[O]** HIST 297 The History of Christianity

★3 (*fi 6*) (either term, 3-0-0). Lecture and discussion course about the development of one of the leading religious traditions in the world. Not open to students who have successfully completed CHRTC 297.

### **[O]** HIST 298 History of Human Conflict

★6 (*fi 12*) (two term, 3-0-0). History of the various facets of warfare and the causes and consequences of conflict. A variety of historical periods may be covered. Note: Not open to students with credit in HIST 300 (1983/84 to 1986/87). Formerly HIST 300.

**HIST 299 History of Modern International Relations**

★6 (fi 12) (two term, 3-0-0). Note: Formerly HIST 303. Not open to students with credit in HIST 303 (1983/84 to 1986/87).

**HIST 300 Topics in European History**

★3 (fi 6) (either term, 3-0-0).

**HIST 301 Early Medieval Europe 338-1050**

★3 (fi 6) (either term, 3-0-0).

**HIST 302 European Intellectual History from the Enlightenment**

★3 (fi 6) (either term, 0-3s-0). A survey of major political, socio-economic ideas and movements since the Enlightenment.

**HIST 303 European Intellectual History Since the Late 19th Century**

★3 (fi 6) (either term, 0-3s-0).

**HIST 304 Reform, Revolt, and Revolution: Europe 1300-1800**

★3 (fi 6) (either term, 3-0-0). Examines and compares ecclesiastical and political reform movements, agricultural and urban revolts, peasant uprisings, the Reformation, Dutch Revolt, and English, American, and French 'Revolutions.'

**HIST 305 France in Revolution, 1760-1870**

★3 (fi 6) (either term, 3-0-0). An introduction to the history of France from the origins of the French Revolution to the downfall of Napoleon III.

**HIST 306 France Since 1870**

★3 (fi 6) (either term, 3-0-0). An introduction to the political, economic and social developments in France from the Third to Fifth Republic.

**HIST 307 A History of the Habsburg Monarchy, 1526-1918**

★6 (fi 12) (two term, 3-0-0). The rise and fall of the multinational empire of the Habsburgs from the unification of Austria, Bohemia and Hungary to the destruction of the empire in World War I.

**HIST 308 Germany Since Frederick the Great**

★3 (fi 6) (either term, 3-0-0). A survey of modern German history since Frederick the Great (1740).

**HIST 311 History of the Byzantine Empire**

★3 (fi 6) (either term, 3-0-0).

**HIST 312 Foundations of East European History**

★3 (fi 6) (first term, 3-0-0). The ethnic, religious, social, and political factors which shaped the development of the peoples of East Central Europe from the Middle Ages through the Age of Enlightenment.

**HIST 313 Eastern Europe in the 19th Century**

★3 (fi 6) (either term, 3-0-0). History of the area, from the Napoleonic War to World War I; the Polish question; the evolution of the Habsburg Empire; formation of the nation-states in the Balkans.

**HIST 314 Eastern Europe Since World War I**

★3 (fi 6) (either term, 3-0-0). The recent history of Eastern Europe.

**HIST 315 Foundations of Ukrainian History**

★3 (fi 6) (either term, 3-0-0). The social, political and cultural development of Ukrainian lands from prehistory through the Enlightenment. Note: Not open to students who have credit in HIST 333.

**HIST 316 19th-Century Ukraine**

★3 (fi 6) (second term, 3-0-0). The Ukrainian people in the Russian and Austro-Hungarian empires. From serfdom to capitalism. The national movement and the making of the modern nation.

**HIST 317 20th-Century Ukraine**

★3 (fi 6) (second term, 3-0-0). World War I and the emergence of the Ukrainian Republic. Ukrainian lands in the USSR and Poland during the interwar period. World War II and Nazi occupation. Soviet Ukraine since 1945.

**HIST 318 Medieval and Imperial Russia**

★6 (fi 12) (two term, 3-0-0). Medieval and Imperial Russia with an Epilogue on the Revolutions of 1917. Note: Not permitted for students who have taken HIST 323 or 325. Formerly part of HIST 323 and 325.

**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.

**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.

**HIST 325 History of Domestic Technology**

★3 (fi 6) (either term, 3-0-0).

**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).

**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.

**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. Note: Formerly part of HIST 330/342. Students who have credit in HIST 342 prior to 1990/91, may not take HIST 329 for credit.

**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). Note: Formerly part of HIST 330/342. Students who have credit in HIST 342 prior to 1990-91, or HIST 330 prior to 1991-92, may not take HIST 331 for credit.

**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).

**HIST 334 Hanoverian Britain, 1688-1789**

★3 (fi 6) (either term, 3-0-0).

**HIST 335 Everyday Life and Popular Culture in Modern Britain**

★3 (fi 6) (either term, 3-0-0). How British peoples have lived, worked and understood their daily lives from the Industrial Revolution to the present.

**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 The Industrial Revolution in Britain**

★3 (fi 6) (either term, 3-0-0). The social and economic development of Britain during the Industrial Revolution, 1750-1850; concomitant changes in the politics and intellectual climate. Note: Not open to students with credit in ECON 312.

**HIST 338 Britain as a World Power**

★3 (fi 6) (either term, 3-0-0). A survey from the end of the Napoleonic Wars to the mid-twentieth century.

**HIST 341 Land and Labor in Latin America**

★3 (fi 6) (either term, 3-0-0). Prerequisite: HIST 241/242 or consent of Department.

**HIST 342 Political and Social Revolution in Latin America**

★3 (fi 6) (either term, 3-0-0). Prerequisite: HIST 241/242 or consent of Department.

**HIST 346 Change and Continuity in 19th-Century Africa**

★3 (fi 6) (either term, 3-0-0). The course explores social, economic, and political changes during a century which saw the ending of the international slave trades and the beginnings of European colonialism. No prerequisite but HIST 246/396 is recommended.

**HIST 350 Comparative American and Canadian History**

★3 (fi 6) (either term, 3-0-0).

**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.

**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.

**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.

**HIST 354 American Economic History**

★3 (fi 6) (either term, 3-0-0). American economic problems and policies in their historical setting.

**HIST 357 American Colonial History**

★3 (fi 6) (either term, 3-0-0). American colonial history from settlement to independence.

**HIST 359 20th-Century America**

★3 (fi 6) (either term, 3-0-0). Emphasis on the relation between the nature of the modern political system in the United States and major social problems. Prerequisite: Any course in American history or consent of Department.

**HIST 360 Topics in Canadian History**

★3 (fi 6) (either term, 3-0-0).

**HIST 361 The Military History of Canada**

★3 (fi 6) (either term, 3-0-0). Canadian armed conflicts from the Iroquois Wars to the Gulf War; emphasizing will be on the evolution of weapons, tactics and military organization.

**HIST 362 History of Alberta**

★3 (fi 6) (either term, 3-0-0). The history of Alberta emphasizing major economic, social, and political developments in the 20th century.

**HIST 363 Topics in the History of Canadian External Relations**

★3 (fi 6) (either term, 3-0-0). The impact of the United States and Great Britain on Canadian development. Formerly HIST 377.

**HIST 364 The History of Social Welfare in Canada**

★3 (fi 6) (either term, 3-0-0). Lecture course which examines the development of the welfare state in Canada from an historical perspective.

**HIST 365 The Canadian West to 1870**

★3 (fi 6) (first term, 3-0-0). A lecture course emphasizing the history of the prairie west but dealing as well with westward expansion and the north and with the trans-mountain west.

**HIST 366 The Canadian West Since 1870**

★3 (fi 6) (either term, 3-0-0).

**HIST 368 The Native Aspect of Canada's History I**

★3 (fi 6) (either term, 3-0-0). Canada's history as it relates to its native people before 1830. Prerequisite: ★3 in Canadian history; ANTHR 350 or 355 strongly recommended.

**HIST 369 The Native Aspect of Canada's History II**

★3 (fi 6) (either term, 3-0-0). Canada's history as it relates to its native people since 1830. Prerequisite: ★3 in Canadian history; ANTHR 350 or 355 strongly recommended.

**HIST 371 The History of Women in Canadian Society**

★3 (fi 6) (either term, 3-0-0). Canadian women as affected by, and as contributing to the major social changes of the 19th and twentieth centuries.

**HIST 372 History of Criminal Justice in Canada**

★3 (fi 6) (either term, 3-0-0). The evolution of the major institutions of the criminal justice system: criminal law; the courts; police and prisons. Note: This course is intended primarily for students in the BA (Special) in Criminology program but is open to other interested students.

**HIST 374 French Canada to Confederation**

★3 (fi 6) (either term, 3-0-0).

**HIST 375 French Canada Since Confederation**

★3 (fi 6) (either term, 3-0-0).

**HIST 376 Canada (World War I to World War II)**

★3 (fi 6) (either term, 3-0-0). Note: Formerly part of HIST 376 (History of Canada since 1914).

**HIST 377 Canada Since World War II**

★3 (fi 6) (either term, 3-0-0). Note: Formerly part of HIST 376 (History of Canada Since 1914).

**HIST 379 A Survey of Canadian Urban History**

★3 (fi 6) (either term, 3-0-0). A survey of Canadian urban history.

**HIST 381 Japan to 1868**

★3 (fi 6) (either term, 3-0-0).

**HIST 382 Japan's Modern Century**

★3 (fi 6) (either term, 3-0-0). The history of Japan since 1868 dealing with Japan's total modernizing experience: social, political, economic and technological development. Motivations, policies, obstacles and achievements are emphasized.

**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. Note: Formerly part of HIST 383 (★6). Students who have credit in HIST 383 ★6 may not take HIST 383 (★3) for credit.

**HIST 385 20th-Century China**

★3 (fi 6) (either term, 3-0-0). The history of China from the Boxer Revolt to the present.

**HIST 386 History of Science and Technology in China**

★3 (fi 6) (either term, 3-0-0). The development of science and technology in China from earliest times to the present.

**HIST 387 Canada's Relations with East Asia**

★3 (fi 6) (either term, 3-0-0). A survey of Canada's contacts with China, Japan, Korea, and Vietnam from the mid-19th century to the present.

**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 T'ang to the Manchu Ch'ing dynasties. Note: Formerly part of HIST 383 (★6). Students who have credit in HIST 383 ★6 may not take HIST 390 for credit.

**HIST 396 History of Medicine I**

★3 (fi 6) (either term, 3-0-0). Introduction to European medicine from Hippocrates to William Harvey. Note: Not open to students with credit in HIST 296.

**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.' Note: Not open to students with credit in HIST 304 up to 1989/90 or HIST 396 from 1990/91 to 1992/93.

**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. Note: Not open to students with credit in HIST 304 up to 1989/90 or HIST 396 from 1990/91 to 1992/93.

**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. Note: Not open to students with credit in HIST 297.

**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 404 Topics in the Renaissance and Reformation**

★6 (fi 12) (two term, 0-3s-0).

**HIST 406 Topics in European History Since the Second World War**

★3 (fi 6) (either term, 0-3s-0).

**HIST 407 Topics in the Intellectual History of Europe Since 1800**

★3 (fi 6) (either term, 0-3s-0).

**HIST 408 Topics in the Intellectual History of Europe Since the Late 19th Century**

★3 (fi 6) (either term, 0-3s-0).

**HIST 410 The French Revolution**

★3 (fi 6) (either term, 0-3s-0).

**HIST 411 Topics in the History of Modern France**

★3 (fi 6) (either term, 0-3s-0). Note: Not open to students with credit in HIST 424 or 426 prior to 1991-92.

**HIST 414 Topics in the History of Modern Germany**

★3 (fi 6) (either term, 0-3s-0). Not open to students with credit in HIST 429, 430 or 431 prior to 1991-92.

**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 417 The Intellectual History of Russia Since 1762**

★3 (fi 6) (either term, 0-3s-0).

**HIST 418 Topics in Russian History from Kievan Times to the Present**

★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 423 Topics In The Habsburg Empire: The Pluralist Laboratory**

★3 (fi 6) (either term, 3-0-0). The history of central Europe, with special focus on the cultural and political problem of a multi-ethnic society under the Habsburg monarchy.

**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 433 Topics in 17th-Century British History**

★3 (fi 6) (either term, 0-3s-0).

**HIST 434 Topics in the History of Hanoverian England**

★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 439 Topics in the British Foreign Policy 1815-1956**

★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.



**L 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.

**L HIST 446 Themes and Issues in African History**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: Previous course in African Studies or consent of Department.

**L HIST 450 Topics in American History**

★3 (*fi 6*) (either term, 0-3s-0).

**L HIST 451 17th Century and 18th-Century America**

★3 (*fi 6*) (either term, 0-3s-0). Note: Not open to students with credit in HIST 451 prior to 1991-92.

**L HIST 452 Topics in 19th-Century America**

★3 (*fi 6*) (either term, 0-3s-0). Note: Not open to students with credit in HIST 456, 457 or 458 prior to 1991-92.

**L HIST 453 Topics in 20th-Century America**

★3 (*fi 6*) (either term, 0-3s-0). Note: Not open to students with credit in HIST 459 prior to 1991-92.

**L 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).

**L HIST 460 Topics in Canadian History**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: A previous course in Canadian history or consent of Department.

**L HIST 461 Topics in History of Immigrant and Ethnic Women in Canada**

★3 (*fi 6*) (either term, 0-3s-0). A study of the shared and unique experiences of women as members of particular ethnic groups, focusing on the nineteenth and twentieth centuries.

**L HIST 464 Topics in the History of the Canadian West**

★6 (*fi 12*) (two term, 0-3s-0). Prerequisite: HIST 365 or 366, or consent of Department.

**L HIST 467 Topics in Alberta History**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: A previous course in Canadian history or consent of Department.

**L HIST 468 Topics in the History of Ethnic Settlement**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: A previous course in Canadian history or consent of Department.

**L HIST 469 Topics in the Political and Constitutional History of Canada Since Confederation**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: A previous course in Canadian history or consent of Department.

**L HIST 470 Topics in Canadian Social History**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: A previous course in Canadian history or consent of Department.

**L HIST 471 Topics in Canadian Intellectual History**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: A previous course in Canadian history or consent of Department.

**L HIST 472 Topics in the History of Pre-Confederation Canada**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: A course in Canadian history or consent of Department. Note: Not open to students with credit in HIST 472 or 473 prior to 1991-92.

**L HIST 474 Topics in the History of 19th-Century French Canada**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: A previous course in Canadian history or consent of Department.

**L HIST 475 Topics in the History of 20th-Century French Canada**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: A previous course in Canadian history or consent of Department.

**L HIST 477 Topics in the History of Canadian External Relations**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: A previous course in Canadian history or consent of Department.

**L HIST 478 Topics in the History of the Canadian North**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: A previous course in Canadian history or consent of Department.

**L HIST 479 Topics in Canadian Native History**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: A previous course in Canadian history or consent of Department.

**L HIST 480 Topics in Japanese History**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: A course in Asian history or consent of Department.

**L HIST 481 Topics in Chinese History**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: A course in Asian history or consent of Department.

**L 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. Note: Students with credit in HIST 481 offered as History of Chinese Thought may not take HIST 483 for credit.

**L HIST 484 Topics in South-East Asian History**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: A course in Asian history or consent of Department.

**L HIST 490 Topics in British Empire and Commonwealth History**

★3 (*fi 6*) (either term, 0-3s-0).

**L HIST 492 Topics in History and Theory**

★3 (*fi 6*) (either term, 0-3s-0). Note: Not open to students with credit in HIST 400 or 401 prior to 1991-92.

**L HIST 493 War and Society in the Modern World**

★3 (*fi 6*) (either term, 0-3s-0). Note: Not open to students with credit in HIST 402, 403, or 404 prior to 1991-92.

**L HIST 494 Topics in Comparative History**

★3 (*fi 6*) (either term, 0-3s-0).

**L HIST 496 Topics in the History of Science**

★3 (*fi 6*) (either term, 0-3s-0). Prerequisite: At least one of HIST 296, 297, 396, 397 or 398, or the Consent of Department.

**HIST 498 Directed Study**

★3 (*fi 6*) (either term, 0-3s-0).

**L HIST 499 Topics in World History**

★3 (*fi 6*) (either term, 0-3s-0).

**HIST 500 Introduction to 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.

**HIST 502 Directed Study**

★6 (*fi 12*) (two term, 0-3s-0). Note: For students in the fourth year of the Honors program. Note: Not open to students with credit in HIST 599.

**Graduate Courses**

Previous study in the area is prerequisite for each course.

**HIST 550 Advanced Topics in Historical Study**

★3 (*fi 6*) (either term, 0-3s-0).

**HIST 601 Philosophy of History and Methodology**

★3 (*fi 6*) (either term, 0-3s-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 610 Interpretations of World History**

★3 (*fi 6*) (either term, 0-3s-0). A critical study, with emphasis on current examples, of works attempting to present a synthesis of world history.

**HIST 613 Selected Aspects of Later Medieval France**

★3 (*fi 6*) (either term, 0-3s-0).

**HIST 615 Topics in the History of Early Modern Germany**

★3 (*fi 6*) (either term, 0-3s-0). Thematic studies in German history, emphasizing popular religion and culture.

**HIST 616 Power Politics in Germany and Its Neighbouring States**

★3 (*fi 6*) (either term, 0-3s-0).

**HIST 620 Urbanization in Modern France**

★3 (*fi 6*) (either term, 0-3s-0).

**HIST 622 European International Relations Since 1870**

★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 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 645 Britain: The First Industrial Nation**

★3 (fi 6) (either term, 0-3s-0).

**HIST 647 The Scottish Enlightenment**

★3 (fi 6) (either term, 0-3s-0).

**HIST 648 Revolution and Imperial Expansion in Hanoverian Britain**

★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 651 The History of the Development of American Indian Policy**

★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 663 Change and Continuity in the Pre-Settlement West**

★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 Social and Intellectual History of British North America**

★3 (fi 6) (either term, 0-3s-0).

**HIST 671 Social Conditions and Social Welfare in Canada Since 1867**

★3 (fi 6) (either term, 0-3s-0).

**HIST 674 Topics in the History of French Canada**

★3 (fi 6) (either term, 0-3s-0).

**HIST 676 Social and Cultural History of Canada Since 1918**

★3 (fi 6) (either term, 0-3s-0).

**HIST 678 History of Crime in Selected Western Societies Since 1500**

★3 (fi 6) (either term, 0-3s-0).

**HIST 685 Tradition and Modernity in China**

★3 (fi 6) (either term, 0-3s-0).

**HIST 687 Modern Japan and the World**

★3 (fi 6) (either term, 0-3s-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 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 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).

**Undergraduate Courses****HECOL 102 Introduction to Human Ecology**

★3 (fi 6) (either term, 3-0-0). Historical and philosophical perspectives about the nature and purpose of human ecology as it has evolved from home economics. Introduction to professional issues including ethics.

**HECOL 238 Material Culture**

★3 (fi 6) (either term, 3-0-0). An introduction to material culture as part of the near environment: culture and consumption, objects and environment, objects as carriers of information, the role of collections and museums in culture.

**HECOL 380 Program Planning, Implementation and Evaluation**

★3 (fi 6) (either term, 3-0-3). Principles and processes of program planning, implementation, evaluation and group leadership based on a human ecological perspective. Laboratory exercises provide opportunities to practise group leadership and planning and evaluation skills in a context appropriate to students' career interests in family life education cultural, business, government and educational agencies. Prerequisite: HECOL 102, AGFOR 204 or HECOL 259, or consent of Instructor.

**HECOL 401 Independent Investigation in Human Ecology**

★3 (fi 6) (either term, 0-0-6). Independent project or study of a topic in human ecology planned by the student with an instructor. Prerequisite: ★90 and instructor's approval.

**HECOL 451 Selected Topics in Housing**

★3 (fi 6) (Spring/Summer, 3-0-3). Normally offered in Spring/Summer.

**HECOL 466 Culture, Environment, and Economy: Human Ecological Perspectives**

★3 (fi 6) (either term, 3-0-0). An introduction to the relationship among cultural values and customs, economic systems, and resources. Topics include trade, community well-being, home-based production, craft, and ecotourism. Prerequisite: HECOL 238 and ★60 of university coursework, or consent of Instructor. Offered in alternate years. Credit cannot be obtained for both TCC 466 and HECOL 466.

**HECOL 480 Methods for Professional Practice**

★3 (fi 6) (first term, 1.5-0-3). Pre-practicum course for Human Ecology students. Exploration of professional issues and alternative modes of practice. Application of administrative and interpersonal skills. Open to Human Ecology students who have completed 84 units of course weight. Normally taken the term preceding HECOL 481 or 482. Prerequisite: HECOL 380.

**HECOL 481 Practicum in Human Ecology**

★3 (fi 6) (second term, 0-1.5s-8). Supervised field experience. Students will be placed in professional settings appropriate to their career goals. Attendance at a weekly integrative seminar is required. Open to Human Ecology students who have completed ★90 Prerequisite: HECOL 480. This course requires payment of additional miscellaneous fees. See §22.2.3 for details.

**HECOL 482 Practicum in Human Ecology**

★6 (fi 12) (second term, 0-1.5s-16). Supervised field experience. Students will be placed in professional settings appropriate to their career goals. Attendance at a weekly integrative seminar is required. Open to Human Ecology students who have completed ★90 Prerequisite: HECOL 480. This course requires payment of additional miscellaneous fees. See §22.2.3 for details.

**Graduate Courses****HECOL 500 Perspectives in Human Ecology**

★3 (fi 6) (either term, 3-0-0). Historical and philosophical perspectives about the nature and purpose of human ecology as it has evolved from home economics; exploration of professional issues and alternative modes of professional practice. Restricted to graduate students.

**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. Restricted to graduate students.

**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: varies with specific offering.

**HECOL 600 Human Ecology Graduate Seminar**

★1 (fi 2) (first term, 0-1s-0). An exploration of selected elements of the research process, including proposal writing, funding, ethics, authorship and dissemination of research findings.

**HECOL 601 Ways of Knowing in Human Ecology**

★2 (fi 4) (first term, 0-2s-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 602 Research Methods In Human Ecology: Selected Topics**

★3 (fi 6) (either term, 0-3s-0). This course focuses on selected research methods

**201.115 Human Ecology, HECOL**Department of Human Ecology  
Faculty of Agriculture, Forestry, and Home Economics**Note:** See also Consumer Studies (CONS); Family Studies (FAM); and Textiles, Clothing, and Culture (TCC) listings for related courses.

as applied to human ecological research. Topics will vary as demand dictates and will be offered as resources permit. May be taken for credit more than once. Prerequisites: graduate standing and permission of the Instructor.

#### **HECOL 616 Families and Work**

★3 (fi 6) (either term, 0-3s-0). Analysis of current work and family issues and policies.

#### **HECOL 650 Seminar in Human Ecology: Selected Topics**

★3 (fi 6) (either term, 0-3s-0). May be taken for credit more than once.

#### **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 690 Advanced Seminar in Research Issues in Human Ecology**

★1 (fi 2) (either term, 0-1s-0). An in-depth exploration of student and faculty research and the issues which comprise such research. Theoretical, methodological, and intervention issues from a variety of research paradigms are explored. Students are required to attend this seminar each term in residence in the doctoral program.

#### **HECOL 692 Advanced Seminar in Practice Issues in Human Ecology**

★3 (fi 6) (either term, 0-3s-0). This course addresses a variety of practice issues (e.g. evaluation, policy development, government and business practice, professional ethics) in family ecology and/or textiles and clothing.

## 201.116 Human Resource Management, HRM

Department of Organizational Analysis  
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.

### Undergraduate Courses

#### **HRM 432 Labor Relations Law and Legislation**

★3 (fi 6) (first term, 3-0-0). An examination of the legal framework within which collective bargaining takes place in Canada. Prerequisite: Open only to third- and fourth-year students.

### Graduate Courses

#### **HRM 703 Seminar in Human Resource Management**

★3 (fi 6) (either term, 3-0-0). A readings seminar covering the theory and relevant research in the areas of human resource management. Reading topics cover theories pertinent to managing human resources, as well as research articles on human resource planning, recruitment and selection, organizational entry, performance management, compensation, and training and development.

## 201.117 Humanités, HUME

Faculté Saint-Jean

### Cours de 1er cycle

#### **HUME 301 L'humanité et ses besoins matériels: l'individu et la collectivité**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude interdisciplinaire des sociétés occidentales et, plus précisément, de l'importance accordée dans ces sociétés aux biens matériels comme sources de bonheur, de prestige et de pouvoir. L'étude de certains concepts (évolution de l'homme et développement des sociétés, travail/loisir, production/consommation, accumulation/partage, etc.), permettra de cerner les difficultés rencontrées dans des sociétés de plus en plus matérialistes, à satisfaire les besoins et désirs des individus et des collectivités. Note: ce cours faisait partie de HUME 302.

#### **HUME 303 L'humanité et ses besoins matériels: problèmes et conflits**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude interdisciplinaire des problèmes auxquels doit faire face l'humanité par rapport au progrès matériel et technologique, à l'exploitation et l'utilisation des ressources naturelles, à l'inégalité dans et entre les sociétés, à la dégradation de la planète, aux conflits d'intérêts,

aux idéologies nationales et internationales. On posera la question du rôle de l'individu et de la collectivité devant ces problèmes. Prérequis: HUME 301 ou l'accord du Vice-doyen aux affaires académiques. Note: ce cours faisait partie de HUME 302.

#### **HUME 401 Optiques et méthodes dans les Humanités**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude des différentes façons d'aborder les Humanités: analyse critique, phénoménologie, herméneutique et autres. Travaux pratiques.

#### **HUME 402 L'humanité et ses besoins culturels/spirituels**

★6 (fi 12) (aux deux semestres, 3-0-0). Etude interdisciplinaire du développement de l'humanité, en particulier de la société occidentale, qui relève le défi de répondre à ses besoins culturels/spirituels. Par l'étude de thèmes concrets actuels dans divers domaines, comme la religion, l'art, le langage, la communication, la morale..., l'étudiant sera amené à redécouvrir l'humain à partir du cheminement accompli dans le domaine culturel/spirituel.

#### **HUME 420 Les grands écrits**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude 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).

## 201.118 Industrial Relations, IND R

Department of Organizational Analysis  
Faculty of Business

### Undergraduate Courses

**Note:** Refer to Organizational Analysis (ORG A) listings.

### Graduate Courses

#### **IND R 701 Seminar in Industrial Relations Foundations**

★3 (fi 6) (either term, 3-0-0).

#### **IND R 702 Seminar in Industrial Relations Processes**

★3 (fi 6) (either term, 3-0-0).

#### **IND R 704 Individual Research**

★3 (fi 6) (either term, 3-0-0).

## 201.119 Informatique, INFOR

Faculté Saint-Jean

### Cours de 1er cycle

#### **INFOR 161 Introduction à l'informatique**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-3). L'utilisation d'un micro-ordinateur. L'ordinateur et ses applications: traitement de textes, graphique, tableur, base de données, transmission de données, etc. L'ordinateur et la société. Quelques éléments de programmation. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour CMPUT 114, 157, 251, 300. La priorité sera accordée aux étudiants de la Faculté Saint-Jean. Anciennement INFOR 261.

#### **INFOR 261 Programmation pratique du micro-ordinateur**

★3 (fi 6) (deuxième semestre, 3-0-0). Etude des principes et des méthodologies nécessaires à la préparation des logiciels destinés aux micro-ordinateurs. Examen du concept de l'enseignement assisté par ordinateur. Rédaction et codification de programmes en employant le langage de programmation "C" et "tenCORE" et "le système "Authorware Professional". Prerequisite: INFOR 161 ou l'équivalent.

## 201.120 Interdisciplinary Undergraduate and Graduate Courses, INT D

University of Alberta

**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.

## Undergraduate Courses

## 201.120.1 Faculty of Agriculture, Forestry, and Home Economics Courses

**INT D 303 Economics of World Agriculture**

★3 (fi 6) (either term, 3-0-0). Economic issues in international agriculture including world food security, changing systems, agricultural trade and aid. The role of agriculture in development and means of improving the performance of agriculture worldwide. Foreign domestic agricultural policies and international trade protection measures, and potential reforms in relation to Canadian agricultural interests. Prerequisite: ECON 101/102. (Offered jointly by the Departments of Economics and Rural Economy). [Rural Economy]

**INT D 356 Sociology of Rural Life**

★3 (fi 6) (either term, 3-0-0). The rural community and rural social systems, with special reference to changes in the rural way of life. Prerequisite: R SOC 355, or one of SOC 100, 202 or 300. (Offered jointly by the Departments of Rural Economy and Sociology.) [Rural Economy]

**INT D 365 Natural Resource Economics**

★3 (fi 6) (either term, 3-0-0). Economics of natural resources related to agriculture and forestry; conservation, population, resource scarcity, property and tenure institutions, economic rent and resource pricing, resource development and evaluation, environmental protection, public resource policy. Prerequisite: ECON 101; ECON 102 recommended. Note: Not open to students with credit in ECON 365. (Offered jointly by the Departments of Rural Economy and Renewable Resources.) [Rural Economy]

**INT D 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. (Offered jointly by the Departments of Economics and Rural Economy.) [Economics]

**INT D 410 Interdisciplinary Health Team Development**

★3 (fi 6) (second term, 0-6.5s-0 in 5 weeks). A process learning course intended to provide experience in building a team of health care professionals from different disciplines. Emphasis is placed on team building, recognizing the unique contributions of different professions, patients and families. (Offered jointly by the following faculties: Agriculture, Forestry, and Home Economics; Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Physical Education and Recreation; and Rehabilitation Medicine.) (Priority will be given to students in all undergraduate health professions where this is a required course.)

**INT D 421 Peatlands**

★3 (fi 6) (first term, 3-0-3). Climatic, geologic and hydrologic factors of peatland development; ecosystem dynamics of peat formation including flora and fauna, biogeochemical cycles, and energy fluxes; stratigraphy and evolution; classification; utilization in forestry, agriculture, horticulture and as fuel. Two one-day field trips on Saturdays. Offered in alternate years. Prerequisites: A 100-level or higher Ecology course and a 300-level SOILS course. (Offered jointly by the Departments of Biological Sciences and Renewable Resources.) [Renewable Resources]

**INT D 455 Molecular Plant Development**

★3 (fi 6) (second term, 3-0-0). Recent advances in plant molecular biology are introduced through a study of plant development at the molecular level. The course examines how developmental processes can be used as model systems to study gene expression in higher plants. Both developmental regulation and stress induced alteration of gene expression are covered using specific examples. Prerequisite: BOT 382 or GENET 364 or PL SC 301. GENET 270 recommended. Offered in odd-numbered years. (Offered jointly by the Departments of Biological Sciences and Agricultural, Food, and Nutritional Science.) [Biological Sciences]

**INT D 456 Rural Social Problems and Public Policy**

★3 (fi 6) (either term, 3-0-0). Social problems in Canadian rural life; analysis of policy making processes related to these problems. Prerequisite: consent of Instructor; INT D 356 recommended. (Offered jointly by the Departments of Rural Economy and Sociology.) [Rural Economy]

**INT D 465 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. [Rural Economy]

**INT D 551 Advanced Plant Biochemistry**

★3 (fi 6) (second term, 3-0-0). Selected topics in plant metabolism, with particular emphasis on mitochondrial electron transport, phosphorylation, and recent advances in carbon assimilation. Evaluation of current research and methods of investigation in these fields. Offered in alternate years. Prerequisites: PL SC 331 and 432 or consent of Instructor. (Offered jointly by the Departments of Biological Sciences and Agricultural, Food, and Nutritional Science.) [Agricultural, Food, and Nutritional Science]

**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; AG EC 502 and 416 recommended. Offered jointly by the Departments of Rural Economy and Economics. [Rural Economy]

## 201.120.2 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.
- (3) Note that ★6 at the 400-level in INT D cannot constitute a minor in the BA program. Normally, a maximum of ★3 at the 400-level in INT D may be applied toward the minor requirement, unless otherwise approved by the minor department.

**INT D 120 Perspectives on Environment**

★3 (fi 6) (either term, 3-0-0). A multidisciplinary introduction to contemporary environmental problems, their sources, and practical and theoretical approaches to their resolution. [Anthropology]

**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]

**INT D 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. Both theoretical and practical issues are addressed, using historical and contemporary case studies. [Department of History and Classics]

**INT D 201 The Slavic World I**

★3 (fi 6) (either term, 3-0-0). Cultural developments in the Slavic lands from the early Middle Ages through Romanticism, with emphasis on literature and the fine arts. Note: Not to be taken by students with credit in INT D 101. [Modern Languages and Cultural Studies: Germanic, Romance, Slavic]

**INT D 202 The Slavic World II**

★3 (fi 6) (either term, 3-0-0). Cultural developments in the Slavic lands from the mid-19th century to the present, with emphasis on literature and the fine arts. Note: Not to be taken by students with credit in INT D 102. [Modern Languages and Cultural Studies: Germanic, Romance, Slavic]

**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]

**INT D 303 Economics of World Agriculture**

★3 (fi 6) (either term, 3-0-0). Economic issues in international agriculture including world food security, farming systems, agricultural trade and aid. The role of agriculture in development and means of improving the performance of agriculture worldwide. Foreign domestic agricultural policies and international trade protection measures, and potential reforms in relation to Canadian agricultural interests. Prerequisite: ECON 101/102. (Offered jointly by the Departments of Economics and Rural Economy).

**INT D 304 Sport and Popular Culture in Canada**

★3 (fi 6) (either term, 0-3s-0). An interdisciplinary examination of the place of Sport in English and French Canadian popular culture, historically and in the present. Topics include the continental dimension of professional sport, and its effects on how Canadians see themselves; contemporary issues in community level sport and nationalism; and Canadian governments' use of sport. Not open to students with credit in INT D 405. (Offered jointly by the Canadian Studies Program, Department of Political Science, and the Faculty of Physical Education and Recreation.) [Political Science]

**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]

**Q INT D 346 Introduction to Eastern Europe and the CIS**

★6 (*fi 12*) (two term, 3-0-0). An interdisciplinary introduction to the study of the socialist system with special reference to Eastern Europe and the Commonwealth of Independent States. (Offered jointly by the Departments of Economics, History and Classics, and Political Science.) [Modern Languages and Cultural Studies: Germanic, Romance, Slavic] Note: This course will not fulfil the Language other than English requirement of the BA degree.

**Q INT D 347 Women and Socialism**

★3 (*fi 6*) (either term, 3-0-0). Socialism in theory and practice: the status of women in Eastern Europe and in CIS (the Commonwealth of Independent States). Prerequisite: consent of Department of Modern Languages and Cultural Studies: Germanic, Romance, Slavic.

**INT D 350 Contemporary Germany: Political and Economic Aspects**

★3 (*fi 6*) (either term, 3-0-0). To be given in three four-week segments each by the Departments of History and Classics, Political Science, and Economics. [Modern Languages and Cultural Studies: Germanic, Romance, Slavic] Note: This course will not fulfil the Language other than English requirement of the BA degree.

**Q INT D 356 Sociology of Rural Life**

★3 (*fi 6*) (either term, 3-0-0). The rural community and rural social systems, with special reference to changes in the rural way of life. Prerequisite: R SOC 355, or one of SOC 100, 202 or 300. (Offered jointly by the Departments of Rural Economy and Sociology.) [Rural Economy]

**INT D 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. (Offered jointly by the Departments of Economics and Rural Economy.) [Economics]

**L 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 100 or one of SOC 100, 202 or 300. (Offered jointly by the Departments of Political Science and Sociology.) [Political Science]

**Q 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]

**Q 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: Germanic, Romance, Slavic. [Faculty of Physical Education and Recreation]

**Q INT D 443 Circumpolar Russia and Siberia**

★3 (*fi 6*) (either term, 3-0-0). The exploration of a variety of aspects of Siberia and the Russian North. Includes the geography and ecology of this sector of the circumpolar regions, their prehistory from the earliest human occupation until the times of Russian colonization, the history of Russian expansion into Siberia, the ethnography of aboriginal circumpolar peoples as well as their political and economic development within the Soviet Union and its successor states. Prerequisite or corequisite: An area-related course in one of Geography, Political Science, Economics, or consent of Departments of Anthropology or Modern Languages and Cultural Studies. (Other participating units normally include the Departments of Economics, and Political Science. Offered jointly by the Departments of Anthropology and Modern Languages and Cultural Studies: Germanic, Romance, Slavic.)

**Q INT D 444 Ukraine**

★3 (*fi 6*) (either term, 3-0-0). Major social, economic, political, and cultural trends in Ukraine in the post-World War II period. Prerequisite or corequisite: An area-related three-weight course in one of geography, history, political science, or Ukrainian, or consent of Department of Modern Languages and Cultural Studies: Germanic, Romance, Slavic. (Other participating units normally include the Canadian Institute of Ukrainian Studies and the Department of History and Classics.) [Modern Languages and Cultural Studies: Germanic, Romance, Slavic] Note: This course will not fulfil the Language other than English requirement of the BA degree.

**Q INT D 445 Poland**

★3 (*fi 6*) (either term, 3-0-0). The political, social, economic, and cultural developments in post World War II Poland. Prerequisite: INT D 346, or POLSH

202, or equivalent, or demonstration to the Department of Modern Languages and Cultural Studies: Germanic, Romance, Slavic of sufficient background in the area. (Other participating units normally include the Department of Economics.) [Modern Languages and Cultural Studies: Germanic, Romance, Slavic] Note: This course will not fulfil the Language other than English requirement of the BA degree.

**Q INT D 447 Soviet and Post-Soviet Political Thought**

★3 (*fi 6*) (either term, 3-0-0). Consideration of Russian, Soviet, and Post-Soviet critical political thought, and current discussions in the successor states of the Soviet Union and abroad on a wide range of political topics, from the organization of state power, interpretations of the history of the Soviet Union and its successor states and their ideology, to people's rights and freedoms, to nationality issues, and other current political problems. (Offered jointly by the Departments of Political Science and Modern Languages and Cultural Studies: Germanic, Romance, Slavic.) [Modern Languages and Cultural Studies: Germanic, Romance, Slavic] Prerequisite: A course in the Slavic and East European Area Studies program, or permission of instructor. Note: Not to be taken by students with credit in INT D 447 (Soviet Dissent).

**INT D 456 Rural Social Problems and Public Policy**

★3 (*fi 6*) (either term, 3-0-0). Social problems in Canadian rural life; analysis of policy making processes related to these problems. Prerequisite: consent of Instructor; INT D 356 recommended. (Offered jointly by the Departments of Rural Economy and Sociology.) [Rural Economy]

**Q INT D 475 The Family in Socio-Historical Perspective**

★3 (*fi 6*) (either term, 3-0-0). Comparative study of the family in socio-historical context with emphasis on North American and European family systems. Critical examination of contemporary sociological family theory in relation to historical data. Issues in socio-historical research methods of family study. Prerequisite: SOC 271 or equivalent. (Offered jointly by the Departments of History and Classics and Sociology.) [Sociology]

**Q INT D 487 Topics in East European Studies**

★3 (*fi 6*) (either term, 3-0-0). Specific topics in the history of the countries of the former USSR taught by the Stuart Ramsay Tompkins Visiting Historian from Russia or another country of the former Soviet Union. Prerequisite: consent of Department. [Modern Languages and Cultural Studies: Germanic, Romance, Slavic]

**Q INT D 498 Historiography of Science and Technology: Problems and Methods**

★3 (*fi 6*) (either term, 0-3s-0). (Offered jointly by the Departments of History and Classics and Philosophy.) [History and Classics]

**Q INT D 499 Conference Course (Slavic and Eastern European Area Studies)**

★3-6 (*variable*) (variable, 3-0-0). Seminar for advanced students in Modern Languages and Comparative Studies designed to introduce fundamental questions in the field. [Modern Languages and Cultural Studies: Germanic, Romance, Slavic] Note: This course will not fulfil the Language other than English requirement of the BA degree. Prerequisite: consent of Department.

**201.120.3 Faculty of Medicine and Dentistry Courses****INT D 224 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. Prerequisite: BIOL 107. Corequisite: BIOL 201 or 207. Credit may be obtained in one of MICRB 224 or MMI 224 or INT D 224. May not be taken for credit if credit already obtained in BIOCH 450. (Offered jointly by the Departments of Biological Sciences and of Medical Microbiology and Immunology.) [Biological Sciences]

**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]

**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 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 203 and 205, and

BIOL 207. Credit may be obtained in only one of IMMUN 370 or MICRB 370 or INT D 371. (Offered jointly by the Department of Biological Sciences and the Department of Medical Microbiology and Immunology.) [Biological Sciences]

#### INT D 372 Immunology Laboratory Techniques

★3 (fi 6) (second term, 0-0-6). Laboratory exercises to demonstrate quantitation of the immune response and the isolation and characterization of antigens. Characterization of cells of the immune system and their functions. Prerequisites: IMMUN 370 or MICRB 370 or INT D 371. Credit may be obtained in only one of IMMUN 405 or MICRB 371, or INT D 372. (Offered jointly by the Departments of Biological Sciences and Medical Microbiology and Immunology.) [Biological Sciences]

#### 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 Interdisciplinary Health Team Development

★3 (fi 6) (second term, 0-6.5s-0 in 5 weeks). A process learning course intended to provide experience in building a team of health care professionals from different disciplines. Emphasis is placed on team building, recognizing the unique contributions of different professions, patients and families. (Offered jointly by the following faculties: Agriculture, Forestry, and Home Economics; Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Physical Education and Recreation; and Rehabilitation Medicine.) (Priority will be given to students in all undergraduate health professions where this is a required course.)

#### INT D 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 203 and 205 and IMMUN 370 or MICRB 370 or INT D 371. Credit may be obtained in only one of IMMUN 451 or MICRB 451 or INT D 452. (Offered jointly by the Department of Biological Sciences and the Department of Medical Microbiology.) [Biological Sciences]

#### 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.)

#### INT D 543 Current Problems in Neuroendocrinology

★3 (fi 6) (second term, 3-0-0). Discussion of selected topics in neuroendocrinology. Credit for this course may be obtained more than once. Offered alternate years. Prerequisite: ZOOL 343 or PHYSYL 401.

#### INT D 544 Physiology of Reproduction

★3 (fi 6) (either term, 3-0-0). Prerequisite: ZOOL 343, or PHYSYL 401. [Biological Sciences]

## 201.120.4 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 Interdisciplinary Health Team Development

★3 (fi 6) (second term, 0-6.5s-0 in 5 weeks). A process learning course intended to provide experience in building a team of health care professionals from different disciplines. Emphasis is placed on team building, recognizing the unique contributions of different professions, patients and families. (Offered jointly by the following faculties: Agriculture, Forestry, and Home Economics; Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Physical Education and Recreation; and Rehabilitation Medicine.) (Priority will be given to students in all undergraduate health professions where this is a required course.)

## 201.120.5 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 Interdisciplinary Health Team Development

★3 (fi 6) (second term, 0-6.5s-0 in 5 weeks). A process learning course intended to provide experience in building a team of health care professionals from different disciplines. Emphasis is placed on team building, recognizing the unique contributions of different professions, patients and families. (Offered jointly by the following faculties: Agriculture, Forestry, and Home Economics; Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Physical Education and Recreation; and Rehabilitation Medicine.) (Priority will be given to students in all undergraduate health professions where this is a required course.)

## 201.120.6 Faculty of Physical Education and Recreation Courses

#### INT D 304 Sport and Popular Culture in Canada

★3 (fi 6) (either term, 0-3s-0). An interdisciplinary examination of the place of Sport in English and French Canadian popular culture, historically and in the present. Topics include the continental dimension of professional sport, and its effects on how Canadians see themselves; contemporary issues in community level sport and nationalism; and Canadian governments' use of sport. Not open to students with credit in INT D 405. (Offered jointly by the Canadian Studies Program, Department of Political Science, and the Faculty of Physical Education and Recreation.) [Political Science]

#### INT D 410 Interdisciplinary Health Team Development

★3 (fi 6) (second term, 0-6.5s-0 in 5 weeks). A process learning course intended to provide experience in building a team of health care professionals from different disciplines. Emphasis is placed on team building, recognizing the unique contributions of different professions, patients and families. (Offered jointly by the following faculties: Agriculture, Forestry, and Home Economics; Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Physical Education and Recreation; and Rehabilitation Medicine.) (Priority will be given to students in all undergraduate health professions where this is a required course.)

#### 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 Comparative Studies. [Faculty of Physical Education and Recreation]

#### INT D 451 Geography of Recreation and Leisure

★3 (fi 6) (either term, 3-0-0). Geographic research on outdoor recreation; behavioral-spatial approaches to participation and conflict in resource use, social and ecological carrying capacity, recreation space management. Prerequisite: consent of Instructor. (Offered jointly by the Department of Earth and Atmospheric Sciences and the Faculty of Physical Education and Recreation.) [Earth and Atmospheric Sciences]

## 201.120.7 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 Interdisciplinary Health Team Development

★3 (fi 6) (second term, 0-6.5s-0 in 5 weeks). A process learning course intended to provide experience in building a team of health care professionals from different disciplines. Emphasis is placed on team building, recognizing the unique contributions of different professions, patients and families. (Offered jointly by the following faculties: Agriculture, Forestry, and Home Economics; Medicine and Dentistry; Nursing; Pharmacy and Pharmaceutical Sciences; Physical Education and Recreation; and Rehabilitation Medicine.) (Priority will be given to students in all undergraduate health professions where this is a required course.)

## 201.120.8 Faculty of Science Courses

**Note:** Any Interdisciplinary Studies courses below will be counted as a science course in a program of study in the Faculty of Science.

#### INT D 224 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. Prerequisite: BIOL 107. Corequisite: BIOL 201 or 207. Credit may be obtained in one of MICRB 224 or MMI 224 or INT D 224. May not be taken for credit if credit already obtained in BIOCH 450. (Offered jointly by the Departments of Biological Sciences and of Medical Microbiology and Immunology.) [Biological Sciences]

#### INT D 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 203 and 205, and BIOL 207. Credit may be obtained in only one of IMMUN 370 or MICRB 370 or INT D 371. (Offered jointly by the Department of Biological Sciences and the Department of Medical Microbiology and Immunology.) [Biological Sciences]

#### INT D 372 Immunology Laboratory Techniques

★3 (fi 6) (second term, 0-0-6). Laboratory exercises to demonstrate quantitation of the immune response and the isolation and characterization of antigens. Characterization of cells of the immune system and their functions. Prerequisites: IMMUN 370 or MICRB 370 or INT D 371. Credit may be obtained in only one of IMMUN 405 or MICRB 371, or INT D 372. (Offered jointly by the Departments of Biological Sciences and Medical Microbiology and Immunology.) [Biological Sciences]

#### INT D 421 Peatlands

★3 (fi 6) (first term, 3-0-3). Climatic, geologic and hydrologic factors of peatland development; ecosystem dynamics of peat formation including flora and fauna, biogeochemical cycles, and energy fluxes; stratigraphy and evolution; classification; utilization in forestry, agriculture, horticulture and as fuel. Two one-day field trips on Saturdays. Offered in alternate years. Prerequisites: A 100-level or higher Ecology course and a 300-level SOILS course. (Offered jointly by the Departments of Biological Sciences and Renewable Resources.) [Renewable Resources]

#### INT D 451 Geography of Recreation and Leisure

★3 (fi 6) (either term, 3-0-0). Geographic research on outdoor recreation; behavioral-spatial approaches to participation and conflict in resource use, social and ecological carrying capacity, recreation space management. Prerequisite: consent of Instructor. (Offered jointly by the Department of Earth and Atmospheric Sciences and the Faculty of Physical Education and Recreation.) [Earth and Atmospheric Sciences]

#### INT D 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 203 and 205 and IMMUN 370 or MICRB 370 or INT D 371. Credit may be obtained in only one of IMMUN 451 or MICRB 451 or INT D 452. (Offered jointly by the Department of Biological Sciences and the Department of Medical Microbiology.) [Biological Sciences]

#### INT D 455 Molecular Plant Development

★3 (fi 6) (second term, 3-0-0). Recent advances in plant molecular biology are introduced through a study of plant development at the molecular level. The course examines how developmental processes can be used as model systems to study gene expression in higher plants. Both developmental regulation and stress induced alteration of gene expression are covered using specific examples. Prerequisite: BOT 382 or GENET 364 or PL SC 301. GENET 270 recommended. Offered in odd-numbered years. (Offered jointly by the Departments of Biological Sciences and Agricultural, Food, and Nutritional Science.) [Biological Sciences]

#### INT D 551 Advanced Plant Biochemistry

★3 (fi 6) (second term, 3-0-0). Selected topics in plant metabolism, with particular emphasis on mitochondrial electron transport, phosphorylation, and recent advances in carbon assimilation. Evaluation of current research and methods of investigation in these fields. Offered in alternate years. Prerequisites: PL SC 331 and 432 or consent of Instructor. (Offered jointly by the Departments of Biological Sciences and Agricultural, Food, and Nutritional Science.) [Agricultural, Food, and Nutritional Science]

## Graduate Courses

**Note:** The following undergraduate courses may be taken for credit by graduate students: INT D 456, 458, 460, 465, 467, 486.

### 201.120.9 Faculty of Arts Courses

#### INT D 519 Application of Modern Literary Theory to Text Analysis

★3-6 (variable) (variable, 3-0-0). Course taught in English. Text samples, however, are taken from German literature and students therefore require at least a reading knowledge of German. [Modern Languages and Cultural Studies: Germanic, Romance, Slavic]

#### INT D 520 Combined Honors Essay

★3-6 (variable) (variable, unassigned). For students in Combined Honors programs. Permission of both Departments is required.

#### INT D 546 East European Soviet and Post-Soviet Studies

★6 (fi 12) (two term, 3-0-0). An interdisciplinary seminar. (Offered jointly by the Departments of Modern Languages and Comparative Studies, Economics, History and Classics, Political Science, Sociology.) [Modern Languages and Cultural Studies: Germanic, Romance, Slavic] Note: This course will not fulfil the Language other than English requirement of the BA degree.

#### 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]

#### INT D 566 Resource Economics II: Economics of the Environment

★3 (fi 6) (either term, 3-0-0). Economic theory and policy relating to resource and environmental quality problems; welfare and public policy issues in resource decision-making; the relationships between economic growth and environmental preservation; externalities and public goods; economics of pollution; recreation economics; selected Canadian environmental issues. [Economics]

#### INT D 593 Seminar in Political Sociology

★3 (fi 6) (either term, 0-3s-0).

#### INT D 594 Quaternary Environments

★6 (fi 12) (two term, 3-0-0). A comprehensive survey of the Quaternary period; dating methods, paleoclimates, vertebrates, case studies in stratigraphy and paleoecology. Prerequisite: a related 400-level course in Anthropology, Biological Sciences, Earth and Atmospheric Sciences, Renewable Resources, or consent of Department. (Offered jointly by the Departments of Anthropology and Earth and Atmospheric Sciences.)

#### INT D 597 China-Japan Comparative Perspectives

★3 (fi 6) (either term, 0-3s-0). A seminar in Chinese/Japanese studies. [East Asian Studies]

#### INT D 598 Topics in East Asian Research

★3 (fi 6) (either term, 0-3s-0). An interdisciplinary inquiry into the culture, history, economics and politics in East Asia (China, Japan, Korea). (Anthropology, History and Classics, Political Science, and Modern Languages and Comparative Studies.) [East Asian Studies]

#### INT D 599 Topics in East Asian Studies: Directed Research Project in East Asian Studies

★6 (fi 12) (two term, variable). Note: East Asian Studies INT D 599 is the course number assigned to graduate students in the East Asian Studies MA Program who take any 400-level University of Alberta course with East Asian content other than CHINA and Japan courses. Permission of the instructor required. May be repeated for credit when course content differs. (Anthropology, History and Classics, Political Science, and Modern Languages and Comparative Studies.) [East Asian Studies]

#### INT D 654 Advanced Topics in Cognitive Science

★3 (fi 6) (either term, 3-0-0). An intensive investigation of selected issues in Cognitive Science, such as mind/body relations, symbolic vs connectionist approaches, intentionality, and computational vs empirical research strategies. Prerequisites: INT D 554, consent of course instructor, and consent of student's home department. [Psychology]

## 201.120.10 Faculty of Medicine and Dentistry Courses

#### INT D 501 A Systematic Approach to Achieving Health

★3 (fi 11) (first term, 1-2s-0). This course will focus on changing concepts of health, health determinants, and the health care system. Emphasis will be given to health models, role of participants in the health care system, and opportunities that exist for interdisciplinary partnerships and collaboration. Interdisciplinary lecture and seminar course offered by the Centre for Health Promotion Studies for the proposed Diploma/Master's degree programs in Health Promotion.

#### INT D 570 Healthcare Ethics

★3 (fi 6) (either term, 3-0-0). 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, Division of Bioethics]

### 201.120.11 Faculty of Nursing Courses

#### INT D 570 Healthcare Ethics

★3 (fi 6) (either term, 3-0-0). 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, Division of Bioethics]

## 201.120.12 Faculty of Physical Education and Recreation Courses

### INT D 501 A Systematic Approach to Achieving Health

★3 (*fi 11*) (first term, 1-2s-0). This course will focus on changing concepts of health, health determinants, and the health care system. Emphasis will be given to health models, role of participants in the health care system, and opportunities that exist for interdisciplinary partnerships and collaboration. Interdisciplinary lecture and seminar course offered by the Centre for Health Promotion Studies for the proposed Diploma/Master's degree programs in Health Promotion.

### INT D 502 Health Promotion Practicum

★3 (*fi 11*) (two term, 0-1s-7c). 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. Prerequisite: INT D 501.

## 201.120.13 Faculty of Rehabilitation Medicine Courses

### INT D 502 Health Promotion Practicum

★3 (*fi 11*) (two term, 0-1s-7c). 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. Prerequisite: INT D 501.

## 201.120.14 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]

### INT D 594 Quaternary Environments

★6 (*fi 12*) (two term, 3-0-0). A comprehensive survey of the Quaternary period; dating methods, paleoclimates, vertebrates, case studies in stratigraphy and paleoecology. Prerequisite: a related 400-level course in Anthropology, Biological Sciences, Earth and Atmospheric Sciences, Renewable Resources, or consent of Department. (Offered jointly by the Departments of Anthropology and Earth and Atmospheric Sciences.).

## 201.121 Italian, ITAL

Department of Modern Languages and Cultural Studies:  
Germanic, Romance, Slavic  
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, or they may be encouraged to seek "Credit by Special Assessment" (see §44.5) where 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 course, credit may be withheld.

### ITAL 100 Beginners' Italian

★6 (*fi 12*) (two term, 3-0-2). Italian grammar and pronunciation. Readings of easy texts dealing with different aspects of Italian culture. Note: This course is not open to students having some previous knowledge of Italian or any of its dialects. See ITAL 101. Not open to students with credit in Italian 30 or its equivalent.

### ITAL 101 First-Year University Italian for Speakers of Italian

★6 (*fi 12*) (two term, 3-0-0). Designed for students having some previous knowledge of Italian. Note: Not open to students with credit in Italian 30 or ITAL 100, or equivalent. Formerly ITAL 200 and 150.

### 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 250 Second-Year Italian

★6 (*fi 12*) (two term, 3-0-0). Selected contemporary prose and poetry. Advanced grammar and phonetics. Prerequisite: Italian 30, ITAL 100, 101 or equivalent. Formerly ITAL 300.

### ITAL 331 Contemporary Italian Short Stories, Before 1945

★3 (*fi 6*) (either term, 3-0-0). Selection of representative major writers. Prerequisite: ITAL 250 or consent of Department.

### ITAL 332 Contemporary Italian Short Stories, Post-Second World War

★3 (*fi 6*) (either term, 3-0-0). Selection of representative major writers. Prerequisite: ITAL 250 or consent of Department.

### ITAL 350 Italian Literature in English Translation

★3 (*fi 6*) (either term, 3-0-0). Major literary works from Dante to the Modern Period. Language of instruction is English. Note: This course will not fulfil the Language other than English requirement of the BA degree.

### ITAL 363 Studies in Italian Literary Genres

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ITAL 250 or consent of Department.

### ITAL 375 Studies in Modern Italian Literature

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ITAL 250 or consent of Department.

### ITAL 394 Composition I

★3 (*fi 6*) (either term, 3-0-0). This course is designed to improve students' command of Italian through intensive practice. Prerequisite: ITAL 250 or consent of Department.

### ITAL 395 Composition II

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: ITAL 250, or consent of Department.

### ITAL 415 Studies in Italian Renaissance Literature

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: A 300-level course in Italian literature or consent of Department.

### ITAL 419 Selected Topics in Italian Literature

★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 250, or 394, or 395, or consent of Department.

### ITAL 499 Directed Reading

★3-6 (*variable*) (variable, 3-0-0). Designed to meet the needs of individual students. Prerequisite: consent of Department.

## Graduate Courses

### ITAL 500 Reading Course

★3-6 (*variable*) (two term, 3-0-0). This course is for graduate students who wish to satisfy the language requirement of their Department. Note: Not open to undergraduates.

### ITAL 599 Conference Course

★3-6 (*variable*) (variable, 3-0-0). A detailed study of some great author or question not dealt with in other Honors or Graduate courses. Designed to meet the needs of individual Honors or Graduate students. Prerequisite: consent of Department.

### ITAL 699 Conference Course

★1-12 (*variable*) (variable, 3-0-0).

## 201.122 Japanese, JAPAN

Department of East Asian Studies  
Faculty of Arts

#### Notes

- (1) There are two routes for embarking upon the study of the Japanese language. One is the intensive route in which both JAPAN 100 and 200 are taken in sequence over the period of one school year. (Note: both JAPAN 100 and 200 are six weight courses.) The other route is non-intensive beginning with JAPAN 101 and 102 (or 207 and 208 which are specially designed for those students with a background in Chinese language) and followed by JAPAN 201 and 202. Those students wishing to major in Japanese are strongly encouraged to take the intensive route.
- (2) JAPAN 100, 101, 102, 150, 200, 201, 202, 215, 250, 301, 302, 305, 306, 315, 350, 401, 402, 405, 406, 425, 426, 451, 452, 481, and 482 are designed for students whose first language is not Japanese.



- (3) For students with knowledge of Japanese, departmental counselling and placement is required.

The following table lists renumbered courses effective 1990/91:

Old	New	Old	New
JAPAN 201	JAPAN 151	JAPAN 325	JAPAN 225
JAPAN 202	JAPAN 152	JAPAN 326	JAPAN 226
JAPAN 300	JAPAN 200	JAPAN 350	JAPAN 250
JAPAN 301	JAPAN 201	JAPAN 351	JAPAN 301
JAPAN 302	JAPAN 202	JAPAN 352	JAPAN 302
JAPAN 307	JAPAN 207	JAPAN 405	JAPAN 451
JAPAN 308	JAPAN 208	JAPAN 406	JAPAN 452
JAPAN 311	JAPAN 305	JAPAN 450	JAPAN 350
JAPAN 312	JAPAN 306		

## Undergraduate Courses

### JAPAN 100 Intensive Basic Japanese I

★6 (fi 12) (either term, 0-10L-0). An intensive course designed to develop basic skills in spoken and written Japanese. Equivalent to JAPAN 101 and 102. Note: Normally students proceed from JAPAN 100 to 200. Not open to students with credit in Japanese 30 or equivalent.

### □ JAPAN 101 Introductory Japanese I

★3 (fi 6) (either term, 0-5L-0). A non-intensive course designed to develop basic skills in spoken and written Japanese. Note: Only one of JAPAN 100 and 101 may be taken for credit. Not open to students with credit in Japanese 30 or equivalent.

### □ JAPAN 102 Introductory Japanese II

★3 (fi 6) (either term, 0-5L-0). A continuation of JAPAN 101. Prerequisite: JAPAN 101 or equivalent. Note: Only one of JAPAN 100 and 102 may be taken for credit. Not open to students with credit in Japanese 30 or equivalent.

### JAPAN 150 First-Year University Japanese

★3 (fi 6) (either term, 0-5L-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 or equivalent or consent of Department. Note: After JAPAN 150, students may proceed to JAPAN 200 or 201.

### JAPAN 200 Intensive Basic Japanese II

★6 (fi 12) (either term, 0-10L-0). A continuation of JAPAN 100. Equivalent to JAPAN 201 and 202. Prerequisite: JAPAN 100, or equivalent.

### □ JAPAN 201 Introductory Japanese III

★3 (fi 6) (either term, 0-5L-0). A non-intensive course designed to develop further basic skills in spoken and written Japanese. Prerequisite: One of JAPAN 100, 102, 208 or equivalent. Note: JAPAN 200 and 201 may not both be taken for credit. JAPAN 201 and 202 together are roughly equivalent to JAPAN 200.

### □ JAPAN 202 Introductory Japanese IV

★3 (fi 6) (either term, 0-5L-0). A continuation of JAPAN 201. Prerequisite: JAPAN 201. Note: JAPAN 200 and 202 may not both be taken for credit. JAPAN 201 and 202 are roughly equivalent to JAPAN 200.

### JAPAN 250 The Japanese Language in Its Cultural Setting I

★6 (fi 12) (Spring/Summer, 0-15L-0). A language/culture immersion course to be studied in Japan. Designed for improvement of oral/aural skills and for increased understanding of Japanese people and culture. Note: Offered in alternate years. Prerequisite: JAPAN 200 or 202 or consent of Department. Note: JAPAN 250 and 350 may not both be taken for credit.

### □ JAPAN 301 Intermediate Japanese I

★3 (fi 6) (either term, 0-5L-0). Designed to develop basic reading skills of modern Japanese prose with special emphasis on grammar and usage. Prerequisite: JAPAN 200 or equivalent.

### □ JAPAN 302 Intermediate Japanese II

★3 (fi 6) (either term, 0-5L-0). A continuation of JAPAN 301. Prerequisite: JAPAN 301 or equivalent.

### □ JAPAN 305 Intermediate Conversation and Composition I

★3 (fi 6) (either term, 0-4L-0). Designed to be taken in conjunction with JAPAN 301 to develop speaking and writing skills of Japanese. Prerequisite: JAPAN 200, or 202, or consent of Department.

### □ JAPAN 306 Intermediate Conversation and Composition II

★3 (fi 6) (either term, 0-4L-0). A continuation of JAPAN 305. Designed to be taken in conjunction with JAPAN 302. Prerequisite: JAPAN 305.

### □ JAPAN 321 Pre-Modern Japanese Literature in English Translation

★3 (fi 6) (either term, 3-0-0). This course studies English translations of Japanese classics such as the Tale of Genji, Noh plays, the haiku of Basho, and the picaresque fiction of Saikaku. No prerequisite. Note: This course will not fulfil the Language other than English requirement of the BA degree.

### □ JAPAN 322 Modern Japanese Literature in English Translation

★3 (fi 6) (either term, 3-0-0). This course studies English translations of major

works in modern Japanese literature. Authors include Mishima, Kawabata, Soseki among others. No prerequisite. Note: This course will not fulfil the Language other than English requirement of the BA degree.

### JAPAN 350 The Japanese Language in Its Cultural Setting II

★6 (fi 12) (Spring/Summer, 0-15L-0). A language/culture immersion course to be studied in Japan. Designed to improve oral/aural skills and increase understanding of Japanese people and culture. Note: Offered in alternate years. Prerequisite: JAPAN 302, or 306, or consent of Department. Note: JAPAN 250 and 350 may not both be taken for credit.

### □ JAPAN 401 Advanced Japanese I

★3 (fi 6) (either term, 4-0-0). 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.

### □ JAPAN 402 Advanced Japanese II

★3 (fi 6) (either term, 4-0-0). A continuation of JAPAN 401. Prerequisite: JAPAN 401 or equivalent.

### □ JAPAN 415 Haiku and the Japanese Poetic Tradition

★3 (fi 6) (either term, 3-0-0). The course will discuss in English the evolution of haiku, the work of the great masters of the 17th and 18th centuries and modern haiku. Prerequisite: JAPAN 321 or any 300-level literature course. Note: This course will not fulfil the Language other than English requirement of the BA degree.

### □ 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 fulfil the Language other than English requirement of the BA degree.

### □ JAPAN 418 Women's Literature in Japan (Pre-Modern)

★3 (fi 6) (either term, 3-0-0). Selection of poetry, fiction, and diaries by women writers that occupy such an important place in the canon of classical Japanese literature will be read in English translation. Prerequisite: JAPAN 321 or any 300-level literature course. This course will not fulfil the language other than English requirement of the BA (AR20) degree. Note: Not open to students with credit in JAPAN 417.

### □ JAPAN 419 Women's Literature in Japan (Modern)

★3 (fi 6) (either term, 3-0-0). Selection of the rich body of literature created by modern Japanese women authors will be read in English translation. Prerequisite: JAPAN 321 or any 300-level literature course. This course will not fulfil the language other than English requirement of the BA (AR20) degree. Note: Not open to students with credit in JAPAN 417.

### □ JAPAN 420 The Modern Japanese Novel in English Translation

★3 (fi 6) (either term, 3-0-0). This course will examine representative novels by modern Japanese writers in English translation with a focus on the evolution of major literary and aesthetic concerns of 20th-century Japanese fiction. Authors to be covered include Shiga, Tanizaki, Dazai, Ibuse, and others. Prerequisite: JAPAN 322 or any 300-level literature course. Note: This course will not fulfil the language other than English requirement of the BA degree.

### □ JAPAN 425 The Structure of the Japanese Language

★3 (fi 6) (either term, 3-0-0). Discussion of the major linguistic features of the Japanese language. Lectures in English. Prerequisite: JAPAN 302 or consent of Department.

### □ JAPAN 426 The History of the Japanese Language

★3 (fi 6) (either term, 3-0-0). The development of the Japanese language from its origin to the present. Lectures in English. Prerequisite: JAPAN 302 or consent of Department.

### □ JAPAN 451 Advanced Readings in Japanese I

★3 (fi 6) (either term, 4-0-0). Advanced readings from newspapers, magazines, social commentary and literary prose. Prerequisite: JAPAN 402 or consent of Department.

### □ JAPAN 452 Advanced Readings in Japanese II

★3 (fi 6) (either term, 4-0-0). A continuation of JAPAN 451. Prerequisite: JAPAN 451 or consent of Department.

### □ JAPAN 481 Supervised Reading in Japanese I

★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 482 Supervised Readings in Japanese II

★3 (fi 6) (either term, 3-0-0). A continuation of JAPAN 481. Prerequisite: JAPAN 481.

## Graduate Courses

### JAPAN 502 Methods of Research: Literature

★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 551 Topics in Japanese Classical and Modern Drama**

★3 (fi 6) (either term, 3-0-0). The course will discuss, in English, forms of Japanese drama from the Noh to modern theatre. A reading knowledge of Japanese is required.

**JAPAN 552 Topics in Japanese Women's Literature (Pre-Modern)**

★3 (fi 6) (either term, 3-0-0). Selections of poetry, fiction, and diaries by women writers that contribute significantly to the canon of classical Japanese literature. A reading knowledge of Japanese is required.

**JAPAN 553 Topics in Japanese Women's Literature (Modern)**

★3 (fi 6) (either term, 3-0-0). Selections of literature created by modern Japanese women authors. A reading knowledge of Japanese is required.

**JAPAN 554 Topics in Japanese Poetry**

★3 (fi 6) (either term, 3-0-0). This course will examine poetry of the premodern and/or modern eras, with reference to the major poetic forms, such as waka, renga, haiku, tanka, and shi. A reading knowledge of Japanese is required.

**JAPAN 556 Topics in the Modern Japanese Novel**

★3 (fi 6) (either term, 3-0-0). This course will examine selected prose fiction by modern writers. Emphasis will be on critical interpretation and analysis of texts. A reading knowledge of Japanese is required.

**JAPAN 599 Topics in Japanese Literature, Premodern and Modern**

★3 (fi 6) (either term, 3-0-0). JAPAN 599 must be taken at least once and may be repeated for credit when course content differs. A reading knowledge of Japanese is required.

**201.123 Korean, KOREA**

Department of East Asian Studies  
Faculty of Arts

**Undergraduate Courses****L 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.

**L 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.

**O KOREA 121 Conversational Korean I**

★3 (fi 6) (first term, 3-0-2). Designed to acquire basic phrases and a knowledge of Korean customs and culture. Note: Only one of KOREA 101 and 121 may be taken for credit.

**O KOREA 122 Introductory Korean II**

★3 (fi 6) (second term, 3-0-2). A continuation of KOREA 121. Prerequisite: KOREA 121 or equivalent. Note: Only one of KOREA 102 and 122 may be taken for credit.

**L 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.

**L KOREA 202 Intermediate Korean II**

★3 (fi 6) (second term, 3-0-2). A continuation of Korea 201. Prerequisite: KOREA 201, or equivalent.

**L 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.

**L KOREA 302 Intermediate Korean IV**

★3 (fi 6) (second term, 3-0-2). A continuation of Korea 301. Prerequisite: KOREA 301, or equivalent.

**L KOREA 321 Premodern Korean Literature in English**

★3 (fi 6) (either term, 3-0-0). An introduction to premodern Korean literature. All readings and lectures in English. No prerequisites. Note: This course will not fulfil the Language other than English requirement of the BA degree.

**L KOREA 322 Modern Korean Literature in English**

★3 (fi 6) (either term, 3-0-0). An introduction to modern Korean literature. All readings and lectures in English. No prerequisites. Note: This course will not fulfil the Language other than English requirement of the BA degree.

**O KOREA 401 Advanced Korean I**

★3 (fi 6) (first term, 3-0-0). Studies in Korean language, culture and customs through readings and activities. Emphasis on sound patterns, grammatical structure, communication, comprehension, and composition. Prerequisite: KOREA 302 or equivalent.

**O KOREA 402 Advanced Korean II**

★3 (fi 6) (second term, 3-0-0). A continuation of KOREA 401. Prerequisite: KOREA 401 or equivalent.

**201.124 Latin, LATIN**

Department of History and Classics  
Faculty of Arts

**Notes**

- (1) Prerequisite for all 400-level Latin courses: LATIN 300, or 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). An introduction to Latin which includes the study of the elements of Latin grammar and the reading of simple texts. Note: Students who have taken Latin 30 or equivalent should consult the Department advisor. Not open to students with credit in LATIN 100.

**L LATIN 102 Beginners' Latin II**

★3 (fi 6) (either term, 3-0-1). A continuation of LATIN 101. Prerequisite: LATIN 101, or consent of Department. Not open to students with credit in LATIN 100.

**L LATIN 103 Intensive Beginning Latin**

★6 (fi 12) (two term, 3-0-2). An introduction to Latin, including the elements of Latin grammar and the reading of simple texts. Not open to students who have successfully completed Latin 30, LATIN 100, 101, or 102. Normally offered during Spring/Summer.

**O 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 100, or 102, or consent of Department. Not open to students with credit in LATIN 300.

**O 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. Not open to students with credit in LATIN 300.

**O LATIN 399 Readings in Latin Authors**

★3 (fi 6) (either term, 3-0-0). Prerequisite: LATIN 300 or 301 or consent of Department.

**L LATIN 411 Latin Grammar and Style**

★3 (fi 6) (either term, 3-0-0). Readings from Latin authors and translation from English into Latin.

**L LATIN 433 Medieval Latin**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: Latin 300, 302, or consent of Department.

**L LATIN 470 Roman Historians**

★3 (fi 6) (either term, 3-0-0).

**L LATIN 475 Roman Elegiac and Lyric Poetry**

★3 (fi 6) (either term, 3-0-0).

**L LATIN 477 Roman Oratory**

★3 (fi 6) (either term, 3-0-0).

**L LATIN 481 Roman Epic and Didactic Poetry**

★3 (fi 6) (either term, 3-0-0).

**L LATIN 488 Latin Authors I**

★3 (fi 6) (either term, 3-0-0).

**L LATIN 489 Latin Authors II**

★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 502 Latin Epic and Didactic Poetry**

★3 (fi 6) (either term, 3-0-0).

**LATIN 506 Latin Poetry**

★3 (fi 6) (either term, 3-0-0).

**LATIN 508 Latin Historiography**

★3 (fi 6) (either term, 3-0-0).

**LATIN 510 Latin Prose Writers**

★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).

**201.125 Latin American Studies, LA ST**

Department of Modern Languages and Cultural Studies:  
Germanic, Romance, Slavic  
Faculty of Arts

**Undergraduate Courses****LA ST 205 Central America and the Caribbean**

★3 (fi 6) (either term, 3-0-0). Regional similarities and national differences. An introduction to Central America and the Caribbean today, including Spanish, French, and Creole speaking countries through study of their cultural contexts and forms of expression. Taught in English by the Department of Modern Languages and Comparative Studies in collaboration with the Departments of Art and Design, Anthropology, History and Classics, and Political Science.

**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. Taught in English by the Department of Modern Languages and Comparative Studies in collaboration with the Departments of Anthropology, Art and Design, History and Classics, and Political Science.

**LA ST 305 Topics in Latin America**

★3 (fi 6) (either term, 3-0-0). Prerequisite: ★3 in Latin American Studies at the 200-level.

**LA ST 310 Latin America at the Movies**

★3 (fi 6) (either term, 3-0-0). 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.

**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.

**LA ST 312 Latin America in Art, Architecture and Urban Space**

★3 (fi 6) (either term, 3-0-0). Art, architecture and urban spaces as texts through which regional and national cultures are expressed and defined. Prerequisite: LA ST 205 or 210 or consent of Department.

**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.

**201.126 Law, LAW**

Faculty of Law

**Undergraduate Courses****LAW 400 Introduction to Law**

★2 (fi 4) (first term, 2-0-0). An introduction to the materials and techniques used in effective legal research. This course teaches the use and application of printed and electronic research tools relevant to each major common-law jurisdiction, with emphasis on Canada and Alberta. It aims at skill-building through a combination of lecture and micro lab presentations and individuals or groups 'hands-on' experiences. This legal research program is linked to the legal writing component of the Constitutional Law course.

**LAW 410 Contracts**

★6 (fi 12) (two term, 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 and Procedure**

★6 (fi 12) (two term, 3-0-0). A general introduction to the criminal law including pretrial procedures and practices; general substantive principles; criminal law and morality; trial procedure; double jeopardy; and sentencing.

**LAW 430 Torts**

★6 (fi 12) (two term, 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 and History**

★6 (fi 12) (two term, 3-0-0). An introduction to the legal and constitutional framework of the legislative, executive, and judicial branches of Canadian government and their interrelationships. The development of Canada's constitution from early colonial days to the present is examined as are the basic principles of Constitutional interpretation, the division of legislative jurisdiction between Parliament and provincial legislatures, and the Charter of Rights and Freedoms. Some emphasis is placed upon the court structure in Canada and the role of the judiciary, including a discussion of the doctrine of precedent. Students are also instructed in the basics of legal writing, including engaging in writing assignments and a moot court exercise.

**LAW 440 Property Law**

★6 (fi 12) (two term, 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**

★4 (fi 8) (variable, 4-0-0). 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 460 Taxation**

★4 (fi 8) (variable, 4-0-0). 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.

**LAW 465 International Law**

★3 (fi 6) (either term, 3-0-0). The major objective of the course is to provide an overview of the basic machinery through which international law operates together with a review of principles which regulate the conduct of nations in their connections with one another. Topics to be covered include: definition, nature and sources of international law and their application in Canadian courts; international personality; state jurisdiction; nationality and individuals; the law of treaties; state responsibility and international claims; and pacific settlement of international disputes.

**LAW 470 Advocacy**

★2 (fi 4) (either term, 2-0-0). 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. Advocacy before tribunals and boards. Prerequisites: Completion of LAW 570 and 575. However, LAW 570 may be a corequisite in both the Fall and Winter Terms.

**LAW 472 Techniques in Negotiation**

★2 (fi 4) (either term, 2-0-0). 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.

**LAW 474 Alternative Dispute Resolution**

★2 (fi 4) (either term, 2-0-0). 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. The student will learn various forms of dispute resolution including client interviewing, negotiation, mediation, arbitration, med-arb, the mini-trial and litigation risk analysis. The course will also look at how alternate dispute resolution fits within the adversarial system, the benefits and drawbacks of each process and how to choose the most appropriate form.

**LAW 485 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.

#### **LAW 495 Research Paper**

★2 (*fi 4*) (either term, 2-0-0). This program will give selected second year students an opportunity to engage in original research. The research topic is subject to prior approval of a Faculty member, who shall direct the students, and of the Associate Dean.

#### **LAW 498 Moot Court Competition**

★2 (*fi 4*) (either term, 2-0-0). Selection to the Alberta Challenge Cup, Client Counselling Competition, Clinton J Ford Moot, Western Canada Trial Moot, or other designated moot court competition team through a preliminary round competition, participation in training sessions in advocacy, criminal trial practice or interviewing and counselling, preparation of a factum, memorial or other written work, participation in final round competition.

#### **LAW 499 Seminars on Specialized Legal Topics**

★2 (*fi 4*) (either term, 0-2s-0). These seminars will cover a specialized topic of emerging importance in the law. 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.

#### **LAW 500 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.

#### **LAW 505 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.

#### **LAW 510 Company Law**

★4 (*fi 8*) (variable, 4-0-0). The law of partnerships, unincorporated associations, and limited liability companies. The incorporation of companies; relationships between the company and outsiders; and relationships of the members of the company within the corporate structure.

#### **LAW 513 Agency**

★2 (*fi 4*) (either term, 2-0-0). The relationship of Principal and Agent. Capacity of parties. Appointment of agents. Married women as agents of their husbands. Delegation. Agents binding their principals; actual authority; ostensible authority and holding out; ratification. Undisclosed principals. Duties of agent to principal. Duties of principal to agent. Determination of agency.

#### **LAW 514 Credit Transactions I**

★2 (*fi 4*) (first term, 2-0-0). A general view of unsecured creditor's rights and remedies, including prejudgment remedies, execution and attachment of debts; priorities among creditors.

#### **LAW 515 Sale of Goods**

★2 (*fi 4*) (either term, 2-0-0). 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.

#### **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 Trial Procedure and Advocacy**

★3 (*fi 6*) (either term, 3-0-0). Practical aspects of criminal trial procedure and advocacy. Topics include: legal ethics; information and indictments; arrest and detention; judicial interim release; election and pleas; preliminary hearings; summary conviction appeals, jury trials; extraordinary remedies; miscellaneous problems in advocacy.

#### **LAW 522 The Law and Practice of Sentencing in Canada**

★3 (*fi 6*) (either term, 3-0-0). This course critically examines definitions of crime and criminality as well as social and legal responses to criminal behavior. Topics to be covered in this course include: the scope and methods of criminological and penological studies; definitions of crime; victims and victimology; gatekeepers in the judicial system (police discretion); the law and practice of sentencing; deterrence; incapacitation and dangerousness; alternatives to imprisonment; the prison system in Canada; parole; native offenders; female and young offenders. Note: Open to second and third year Law students.

#### **LAW 531 Law and Medicine**

★2 (*fi 4*) (either term, 2-0-0). 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 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 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; The Assurance Fund; Limitations of Actions.

#### **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 551 Municipal and Planning Law**

★3 (*fi 6*) (either term, 3-0-0). The first part of the course will consist of an examination of the theory, structure, organization and operation of local government units in Alberta. The powers and duties of local governments to make laws, to tax, to expropriate, to enter into contracts and to provide and maintain municipal servicing infrastructure will be explored as will the role of the courts, both procedurally and substantively, in respect of supervising the judicial review proceedings and actions in contract and tort. The second part of the course will focus on municipal duties and powers relative to land use planning and regulation as well as the nature and role of non-municipal planning authorities. The objective is to leave the student with an appreciation of how a subdivision or development project is processed through the maze of regulations and agencies that are typically confronted and the role of the lawyer in that process.

#### **LAW 552 Natural Resources Law**

★2 (*fi 4*) (either term, 2-0-0). 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. Particular emphasis is placed on water resources.

#### **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**

★2 (*fi 4*) (either term, 2-0-0). 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 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). The focus of this course will be the Canadian laws and policies designed to control air, land, and water pollution. The course will introduce basic environmental concepts and examine Canadian regulatory legislation; including licensing systems, the use of quasi-criminal sanctions, and environmental impact assessment processes. The course will also review relevant constitutional issues and evaluate the usefulness of the common law as a means to achieve and maintain environmental quality. Other topics may include alternative legal approaches to the resolution of environmental problems, such as the economic incentives, wildlife protection, an environmental Bill of Rights, wilderness preservation, the public trust doctrine of environmental mediation. Note: Open to second and third year Law students.

#### **LAW 560 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 460.

#### **LAW 565 International Business Transactions**

★3 (*fi 6*) (either term, 3-0-0). This is a survey course on the international and domestic law involved in international trade/investment activities of Canadian and foreign business entities. In the international law sphere, the law of the World Trade Organization (WTO) and regional economic integration agreements such as the North American Free Trade Agreement (NAFTA) will be studied. In the area of private law, the legal aspects of international business transactions will be considered, including contract types and drafting, financing of transactions, and dispute settlement by international commercial arbitration.

#### **LAW 567 Pacific Rim Law**

★2 (*fi 4*) (either term, 2-0-0). 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 570 Civil Procedure**

★4 (*fi 8*) (variable, 4-0-0). The fundamentals of judicial procedure; the jurisdiction of courts, and the process of the courts. Clinical sessions. Rules of Court.

#### **LAW 575 Evidence**

★4 (*fi 8*) (variable, 4-0-0). The adversary system in trial and appellate courts; relevance and admissibility; character evidence including similar facts; opinion evidence; the hearsay rule and its exceptions; illegally obtained evidence; judicial notice; burdens of proof and presumptions; quantum of proof; corroboration; competence, compellability and privilege; parole evidence of rule; oaths and affirmations.

#### **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 585 Women and the Law**

★3 (*fi 6*) (either term, 3-0-0). This course examines women's relationship to the law in a number of different contexts. Topics covered in the course include: sexual assault, new reproductive technologies, pornography, sexual harassment, the intersection of race and gender, domestic violence, the battered women's syndrome defence, child sexual abuse, fetal protection law, surrogate motherhood, lesbian women and the law, aboriginal women and the law, the feminization of poverty, women in the legal profession, equality litigation and the work of the Women's Legal Education and Action Fund. The course seeks to introduce gender analysis in a legal context. The focus of the course is on debates within feminist legal scholarship about how the law and legal institutions could respond to the concerns of women more effectively.

#### **LAW 586 Children and the Law**

★3 (*fi 6*) (either term, 3-0-0). This course will offer a critical examination of the current legislative regime and policy underlying the legal treatment of children in Canadian society. A review of case law and legislation relating to areas such as neglect, guardianship, custody, adoption, young offenders and legal capacity will be undertaken to better understand the policy and law forming a distinct legal regime for children.

#### **LAW 588 Immigration Law**

★2 (*fi 4*) (either term, 2-0-0). 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, Metis 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 595 Research Paper**

★2 (*fi 4*) (either term, 2-0-0). This program will give selected third year students

an opportunity to engage in original research. The research topic is subject to prior approval of the Associate Dean and the Faculty Supervisor. The research topic shall be different from that used in LAW 495 and have a different Faculty Supervisor.

#### **LAW 598 Moot Court Competition**

★3 (*fi 6*) (either term, 3-0-0). Selection to the Gale Cup, Jessup Moot, Laskin Moot, or other designated moot competition team through a preliminary round competition, preparation of a factum or memorial, training in oral advocacy 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.

#### **LAW 600 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.

#### **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 510.

#### **LAW 614 Credit Transactions II**

★3 (*fi 6*) (second 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 scope, attachment, perfection, priority rules, proceeds, and remedies including receivership. The federal Bank Act security will be introduced. The course will also provide an overview of insolvency law. Topics will include fraudulent conveyances and preferences, statutory liens and deemed trusts, bankruptcy and alternatives to bankruptcy. Note: Students are strongly advised to take Credit Transactions I and Credit Transactions II in the same academic year.

#### **LAW 620 Advanced Criminal Law**

★2 (*fi 4*) (either term, 2-0-0). 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.

#### **LAW 630 Advanced Torts**

★2 (*fi 4*) (either term, 2-0-0). An analysis of, and problems in, the Law of Torts.

#### **LAW 637 Advanced Problems in Constitutional Law**

★3 (*fi 6*) (either term, 3-0-0). This course 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 Relations.

#### **LAW 639 Constitutional Litigation**

★3 (*fi 6*) (either term, 3-0-0). The course 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.

#### **LAW 640 Real Estate Transactions**

★3 (*fi 6*) (either term, 3-0-0). The law governing agreements for sale of land; the open contract of sale, implied terms, special covenants in agreements for sale. Remedies of vendors and purchasers; election of remedies; cancellation and determination clauses. Deposits and instalments. Mortgages: legal, equitable and statutory. Foreclosure; sales; redemption; possession and attornment. Prerequisite: LAW 540.

#### **LAW 650 Alberta Law Review**

★2 (*fi 4*) (either term, 2-0-0). 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.

#### **LAW 655 Alberta Law Review Research Paper**

★2 (*fi 4*) (either term, 2-0-0). This course will provide 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.

#### **LAW 659 International Environmental Law**

★3 (*fi 6*) (either term, 3-0-0). This course will examine the development of international law principles in the environmental area. Topics to be covered include: customary principles of state responsibility; transboundary pollution of international waterways; marine pollution control (oil pollution, dumping, and land-based sources); international air pollution control (ozone, climate change, acid rain); transboundary movement of hazardous materials; disarmament and environment; endangered species conservation; and sustainable resource development. The various models for environmental regulation in internationally-shared areas will also be discussed. It is recommended, but not required, that students enrolled in this course take International Law.

#### **LAW 660 Estate Planning**

★2 (*fi 4*) (either term, 2-0-0). 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 460.

#### **LAW 670 Professional Responsibility**

★2 (*fi 4*) (either term, 0-2s-0). A consideration of the responsibilities of the lawyer to the profession and the profession to the public. Ethics and organization of the profession.

#### **LAW 675 Advanced Evidence**

★2 (*fi 4*) (either term, 2-0-0). This 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.

#### **LAW 680 Restitution and Remedies**

★3 (*fi 6*) (either term, 3-0-0). A study of the development and application of the idea of unjust enrichment and the circumstances in which a remedy is available irrespective of an action in tort or contract. This includes quasi-contractual recovery, tracing, and the use of the constructive trust.

#### **LAW 687 Family at Risk**

★3 (*fi 6*) (either term, 3-0-0). This course 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.

## Graduate Courses

#### **LAW 695 Research Paper**

★2 (*fi 4*) (either term, 2-0-0). This program will give selected graduate students an opportunity to engage in original research. The research topic is subject to prior approval of the Faculty supervisor and the Chair of the Graduate Studies Committee. The research topic shall be different from the thesis topic.

#### **LAW 699 Seminars on Specialized Legal Topics**

★2 (*fi 4*) (either term, 0-2s-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.

## 201.126.1 Non-LLB Spring/Summer Courses

**Note:** The following courses, normally offered in Spring/Summer, are available to students in other faculties. They will not be considered for credit in the LLB program.

#### **LAW 300 Law for Non-LLB Students I**

★3 (*fi 6*) (first 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 LLB Program.

## 201.127 Library and Information Studies, LIS

School of Library and Information Studies  
Faculty of Education

## Undergraduate Courses

#### **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-ages readers. Adolescents' reading and media needs and interests, and current issues and trends will be examined. This course is not open to MLIS students.

## 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.

The following courses are also available as part of the MLIS program: EDES 540, 541, 543, 546, 547, and 548; EDAL 547; EDIT 535, 537, 547, and 568.

#### **LIS 501 Introduction to Library and Information Studies**

★3 (*fi 6*) (first term, 3-0-0). An introduction to the historical, current, and potential roles of library and information professionals in western society. Introduces the study of environmental factors affecting library and information services. Economic, social, legal, political, technological and professional factors will be examined. Required course.

#### **LIS 502 Organization of Knowledge and Information**

★3 (*fi 6*) (first term, 3-0-0). An introduction to the organization of knowledge and information, including bibliographic control, classification, indexing, and abstracting. Required course.

#### **LIS 503 Library Materials and Information Services**

★3 (*fi 6*) (first term, 3-0-0). An introduction to the functions of information services programs, an examination of policies designed to build materials collections in support of such programs, and an opportunity to become familiar with examples of major reference/information sources. Required course.

#### **LIS 504 Management Principles for Library and Information Services**

★3 (*fi 6*) (either term, 3-0-0). An introduction to principles of management applicable to the organization of library and information services. Required course.

#### **LIS 505 Research Methods for Library and Information Studies**

★3 (*fi 6*) (second term, 3-0-0). An introduction to the nature of research and to the methodologies and techniques used in library and information studies. Required course.

#### **LIS 506 Introduction to Automation and Bibliographic Information**

★3 (*fi 6*) (either term, 3-0-0). An introduction to automation and its implications for libraries and information services. Required course.

#### **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 511 Materials for Adults**

★3 (*fi 6*) (either term, 3-0-0). The recreational, educational and professional library and information needs of adults (including the less specialized needs of the high school, college and university communities), and the materials available to meet the needs.

#### **LIS 512 Information Resources for Academic Disciplines**

★3 (*fi 6*) (either term, 3-0-0). An interdisciplinary approach to the selection, organization and use of library and information resources to support research and learning in an academic environment. Emphasis is on the nature and function of library and information resources, scholarly communication patterns and information-seeking behaviors.

#### **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 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 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 525 Reference Service Theory and Field Experience**

★3 (fi 6) (either term, 0-1s-2). A comprehensive examination of the reference interview, measurement and evaluation techniques for reference service, and related administrative concerns. Extensive field experience.

**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). The description and classification of various forms of materials for either manual or computerized situations.

**LIS 535 Indexing and Abstracting**

★3 (fi 6) (either term, 3-0-0). The principles and practice of indexing and abstracting in a traditional or computerized centre.

**LIS 536 Electronic Reference and Information Retrieval**

★3 (fi 6) (either term, 3-0-0). Information storage and retrieval services, including their development, maintenance, and use. This course requires payment of additional miscellaneous fees. See §22.2.3 for details.

**LIS 537 Management of Information Technology**

★3 (fi 6) (either term, 3-0-0). The selection, installation and management of integrated library systems and local area networks. The principal model is the integrated library system, with considerable emphasis on strategic factors, including negotiations and contracts.

**LIS 538 Automation in Libraries and Information Centres**

★3 (fi 6) (either term, 3-0-0). An examination of topics of current interest related to the application of computers and communications technology in libraries and information centres.

**LIS 540 School Media Centres**

★3 (fi 6) (either term, 3-0-0). The concept and organization of media resource centres in elementary and secondary schools.

**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 582 Contemporary Issues in Library and Information Studies**

★3 (fi 6) (either term, 0-3s-0). New and continuing topics of concern or debate in the library and information professions, and how they influence information attitudes and programs.

**LIS 583 Comparative Librarianship**

★3 (fi 6) (either term, 3-0-0). The nature of comparative librarianship as a discipline, and the application of principles to practice.

**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 588 Communications**

★3 (fi 6) (second term, 3-0-0). The principles and practices of professional communication in library and information service organizations.

**LIS 589 Feminism and Library and Information Studies**

★3 (fi 6) (either term, 3-0-0). Examines the nature of librarianship as a profession, issues related to information, and practices of information management from gendered perspectives using applicable feminist theoretical interpretations.

**LIS 590 Practicum**

★3 (fi 6) (either term, 100 hours). The application of course work learning through experiential learning in a library and information centre setting. Prerequisite: completion of 8 courses in the MLIS program.

**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 593 History of the Record**

★3 (fi 6) (either term, 3-0-0). The development of archival and records management practice since ancient times, with emphasis on contemporary professional standards and methods.

**LIS 594 Records Management**

★3 (fi 6) (either term, 3-0-0). The theory and techniques of records management.

**LIS 595 Special Media Archives**

★3 (fi 6) (either term, 3-0-0). The management of non-textual archival records, and examination of special issues facing contemporary archivists such as freedom of information and copyright. Prerequisite: LIS 593.

**LIS 597 Seminar in Advanced Research Methods for Library and Information Studies**

★3 (fi 6) (first term, 0-3s-0). In-depth examination of research methodologies relevant to the field of library and information studies, and to the research interests of students pursuing doctoral programs, thesis-route master's programs, and other advanced projects.

**LIS 598 Special Topics**

★3 (fi 6) (either term, 3-0-0). 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.

## 201.128 Linguistics, LING

Department of Linguistics  
Faculty of Arts

### Undergraduate Courses

**LING 101 Introduction to Linguistics I**

★3 (fi 6) (either term, 3-0-0). An introduction to the central concepts of linguistics: linguistic categories and structure (phonetics, phonology, morphology, syntax, semantics). Formerly LING 201.

**LING 102 Introduction to Linguistics II**

★3 (fi 6) (either term, 3-0-0). An introduction to historical, cross-disciplinary, and applied areas in linguistics (e.g. language change, language acquisition, language in society). Prerequisite: LING 101. Formerly LING 202.

**LING 204 English Syntax**

★3 (fi 6) (either term, 3-0-0). Linguistic analysis of the syntax of modern English. Prerequisite: LING 101. Formerly LING 382.

**LING 205 Practical Phonetics**

★3 (fi 6) (either term, 3-0-0). Recognizing, transcribing, and producing speech sounds using the International Phonetic Alphabet; problems in phonetic analysis; techniques for describing the sound system of an unfamiliar language.

**LING 208 Morphology and the Lexicon**

★3 (fi 6) (either term, 3-0-0). Basic principles of word formation and structure; the organization of the lexicon and the representation of words. Prerequisite: LING 101.

**LING 209 Syntax and Semantics**

★3 (fi 6) (either term, 3-0-0). Basic principles in syntax (constituent structure, sentence relatedness, grammatical relations) and semantics. Prerequisite: LING 101. Note: Not to be taken by students with credit in LING 204 before 1992-93.

**LING 210 Phonetics and Phonology**

★3 (fi 6) (either term, 3-0-0). Basic principles of descriptive phonetics and of phonology. Prerequisite: LING 101. Note: Not to be taken by students with credit in LING 203.

**LING 213 Experimental Phonetics and Speech Science**

★3 (fi 6) (either term, 3-0-0). Articulatory phonetics; anatomy of speech and hearing; interpretation of sound spectrograms; models of speech production and perception. Prerequisite: LING 101 or 205 or consent of Department.

**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.

**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. Formerly LING 411.

**LING 318 Development of Modern Linguistic Concepts**

★3 (fi 6) (either term, 3-0-0). An examination of the fundamental concepts of 20th-century linguistic thought: de Saussure, Sapir, Bloomfield, Firth, the Prague School, and others. Prerequisite: LING 101, or consent of Department. Formerly LING 408.

**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. Formerly LING 416.

**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. Formerly LING 450.

**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. Prerequisite: LING 101 or consent of Department.

**LING 322 Language and Gender**

★3 (fi 6) (either term, 3-0-0). An examination of gender-related differences in the structure of language, discourse, communication, and how those differences relate to language processing, acquisition, and loss. Prerequisite: LING 101 or consent of Department. Not offered every year.

**LING 323 Linguistics and the Mind**

★3 (fi 6) (either term, 3-0-0). Language as an expression of the symbolic capacity of the mind. Attention will be given to the relation between linguistic meaning and such concepts as belief, judgement, and assertion, and between these and our knowledge of the world. Prerequisite: None.

**LING 332 The Nature of Foreign Accent**

★3 (fi 6) (either term, 3-0-0). A study of the causes of foreign accent and a critical examination of the various strategies used in foreign accent reduction. Prerequisite: LING 210 or consent of Department.

**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.

**LING 401 Semantics**

★3 (fi 6) (either term, 3-0-0). An overview of natural language semantics at both the lexical and clause levels. Topics covered include sense, reference, features, compositionality, semantic roles, logical form, categorization, and conceptualization. Prerequisite: LING 208 and 209.

**LING 405 Historical Linguistics**

★3 (fi 6) (either term, 3-0-0). Principles and methods in the study of language change. Prerequisites: LING 208 and 210.

**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. Prerequisites: LING 208 and 209.

**LING 409 Syntactic Theory**

★3 (fi 6) (either term, 3-0-0). Syntactic analysis and argumentation in generative theory and its extensions and revisions. Prerequisite: LING 209; 208 or 210.

**LING 410 Phonological Theory**

★3 (fi 6) (either term, 3-0-0). Generative phonological analysis: phonological rules, representations, and related theoretical issues. Prerequisite: LING 210; 208 or 209.

**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.

**LING 500 Psycholinguistics**

★3 (fi 6) (either term, 3-0-0). Issues and methods involved in the experimental study of language: language production, comprehension, the mental lexicon, and discourse. Prerequisite: LING 209; 208 or 210, STAT 141 or PSYCO 211 recommended.

**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.

**LING 502 Honors Project**

★3 (fi 6) (second term, 3-0-0). Directed Honors thesis. Prerequisites: LING 501 and consent of Department. Note: Required of all BA (Honors) students in Linguistics in their final year.

**LING 512 Acoustic Phonetics**

★3 (fi 6) (either term, 3-0-0). Analysis of the articulatory, perceptual, and acoustic aspects of the speech signal; measuring the acoustic aspects of speech. Prerequisite: LING 312 (LING 412, prior to 1997/98).

**Graduate Courses****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.

**LING 601 Seminar in Phonology and Morphology**

★3 (fi 6) (either term, 0-3s-0). Critical examination of selected theoretical issues and related experimental studies in phonology and morphology. Prerequisite: LING 410 or consent of Department.

**LING 602 Seminar in Syntax**

★3 (fi 6) (either term, 0-3s-0). Critical examination of selected theoretical issues and related experimental studies in syntax. Prerequisite: LING 409 or consent of Department.

**LING 603 Quantitative Methods in Linguistics**

★3 (fi 6) (either term, 3-0-0). Analysis of variance and experimental design in relation to problems in experimental linguistics. Prerequisite: A course in elementary statistics or consent of Department.

**LING 604 Seminar in Psycholinguistics**

★3 (fi 6) (either term, 3-0-0). A review of the current theories and research in psycholinguistics. Prerequisite: LING 500.

**LING 605 Seminar in Experimental Phonetics**

★3 (fi 6) (either term, 3-0-0). A survey of the present state of knowledge in speech production and perception. Prerequisite: LING 512 (LING 412 prior to 1997/98).

**LING 610 Formal Grammatical Theory**

★3 (fi 6) (either term, 3-0-0). Current approaches in formal grammatical theory. Prerequisite: LING 602 or consent of Department.

**LING 611 Formal Phonological Theory**

★3 (fi 6) (either term, 3-0-0). Current approaches in formal phonological theory. Prerequisite: LING 601 or consent of Department.

**LING 614 Methods in Experimental Phonetics**

★3 (fi 6) (either term, 0-1s-3). Theoretical and practical training in experimental phonetics. Emphasis on practical experience with on-going research. Prerequisite: LING 512 (LING 412 prior to 1997/98).

**LING 615 Methods in Experimental Psycholinguistics**

★3 (fi 6) (either term, 0-1s-3). Theoretical and practical training in experimental psycholinguistics. (Emphasis on practical experience with on-going research.) Note: This course should be taken late in the MSc program. Prerequisite: LING 603.

**LING 616 Methods in Experimental Phonology**

★3 (fi 6) (either term, 0-1s-3). Theoretical and practical training in experimental phonology. Emphasis on practical experience with on-going research. Prerequisite: LING 603.

**LING 617 Methods in Second Language Acquisition**

★3 (fi 6) (either term, 0-1s-3). Theoretical and practical training in second language acquisition research, with emphasis on practical experience. Prerequisite: LING 603.

**LING 636 Analysis of Meaning**

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

**LING 637 Discourse Analysis**

★3 (fi 6) (either term, 0-3s-0). An examination of a variety of topics in the area of discourse including discourse structure, pragmatics, discourse-conditioned grammatical alterations, and discourse models. Prerequisite: consent of Department.

**LING 638 Second Language Acquisition**

★3 (fi 6) (either term, 3-0-0). Analysis of recent theoretical and empirical research in second language acquisition. Prerequisite: LING 320 or consent of Department.

**LING 645 Linguistic Analysis of Aphasic Language**

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

**LING 655 Instrumentation in Experimental Linguistics**

★3 (fi 6) (either term, 3-0-0). Prerequisites: LING 312 and 512, MATH 117 and 118 or consent of Department.

**LING 670 Foreign Language Analysis**

★3 (fi 6) (either term, 0-1s-3). Study and analysis of a language other than English resulting in demonstrated proficiency as well as analytic competency of the language's structural, psycholinguistic, or acquisitional properties. 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 900 Directed Research Project**

★3 (fi 6) (variable, unassigned).

**201.129 Linguistique, LINGQ**

Faculté Saint-Jean

**Cours de 1er cycle****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. Anciennement LINGQ 101.

**LINGQ 300 Linguistique appliquée**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Application de la linguistique à l'enseignement, à la traduction, à l'ingénierie et à la littérature. Prérequis: LINGQ 200 ou équivalent. Anciennement LINGQ 430.

**LINGQ 499 Etude dirigée en linguistique**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Prérequis: l'accord du Vice-doyen aux affaires académiques.

**201.130 Linguistique romane, LIN R**

Faculté Saint-Jean

**Cours de 1er cycle****LIN R 320 Linguistique française: phonétique et morphophonologie**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Phonétique et phonologie comparées du français standard, du canadien-français et de l'anglais. Morphèmes de l'oral et de l'écrit. Evolution phonétique: incidence sur le français actuel. Facteur auditif et acquisition de L2. Prérequis: LINGQ 200. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour R LIN 401 à la Faculté des Arts. Anciennement LIN R 420.

**201.131 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.

**201.132 Maîtrise en sciences de l'éducation, M EDU**

Faculté Saint-Jean

**Cours de 2e cycle****M EDU 500 Langue, culture et éducation**

★3 (variable) (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. Cours à distance. Voir \$200.

**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.

**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).

**M EDU 520 Tendances actuelles en éducation des francophones**

★3 (variable) (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. Cours à distance. Voir \$200.

**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.

**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.

**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.

**M EDU 532 L'écologie de la salle de classe**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude des influences et des relations interpersonnelles qui ont un effet sur l'apprentissage, l'enseignement et la communication en salle de classe.

**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.

**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 socio-politique.

**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.

**M EDU 580 Méthodologie de la recherche en éducation I**

★3 (variable) (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. Cours à distance. Voir \$200.

**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. Prérequis: M EDU 580.

**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.

**M EDU 583 La recherche et le praticien**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude des retombées de la recherche sur la pratique éducative. Méthodologie de la recherche-action, et la formation professionnelle continue des enseignants.

**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).

**M EDU 597 Séminaire portant sur l'enseignement au niveau élémentaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0).

**M EDU 598 Séminaire portant sur l'enseignement au niveau secondaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0).

**M EDU 599 Etude personnelle dirigée**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0).

**M EDU 900 Projet de recherche dirigé**

★6 (fi 12) (variable, unassigned).

**201.133 Management Information Systems, MIS**

Department of Accounting and Management 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, 3-0-2). Introduction to all major areas of information systems. Technology and file systems, organizational and behavioral issues, data modelling, 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. The lab component will be taught for three weeks during the term.

**MIS 412 Managerial Support Systems**

★3 (fi 6) (either term, 3-0-2). Use of information technology to support the efficiency and effectiveness of management decision making. Fundamentals of four information technologies: (1) decision support systems, (2) group decision support systems, (3) executive information systems, and (4) knowledge-based expert systems. Construction and use of technologies by managers. Use of integrative cases to analyze introduction of technology and how it transforms managerial work. Prerequisite: MIS 311. Note: The lab component will be taught for five weeks during the term.

**MIS 413 Systems Analysis and Design**

★3 (fi 6) (either term, 3-0-2). Critical stages of the traditional systems development life cycle. Determination and analysis of information systems requirements and their translation into detailed design specifications. Technical and managerial aspects of systems analysis, design and implementation. Design, evaluation, and selection of the five components of computerized information systems: data, hardware, software, people, and procedures. Prerequisite: MIS 311. Note: The lab component will be taught for ten weeks during the term.

**MIS 414 Information Systems Management**

★3 (fi 6) (either term, 3-0-2). This course examines current key issues in information management. For each topic, three interrelated areas are discussed: IT for strategic business advantage, social and organizational issues, and IT architecture. Current topics include: IS architectural trends and organizational development, strategic data management, IS strategy and business process redesign, electronic commerce strategies including EDI, the Internet, and groupware, and information resource management. Prerequisite: MIS 311. Note: The lab component will be taught for two weeks during the term.

**MIS 415 Data Base Design and Administration**

★3 (fi 6) (either term, 3-0-2). Application of database concepts in organizations. This course provides 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. Prerequisite: MIS 311. Note: The lab component will be taught for ten weeks during the term.

**MIS 488 Selected Topics in Management Information Systems**

★3 (fi 6) (either term, 3-0-0). This course may contain a lab component. Prerequisite: MIS 311.

**MIS 494 Individual Research Projects**

★3 (fi 6) (either term, 3-0-0). Special study for advanced undergraduates. Prerequisites: consent of Instructor and Associate Dean.

**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 515 Information Management for Knowledge Intensive Industries**

★1.5 (fi 3) (either term, 18 hours). This course introduces process modelling techniques in information management, and skills necessary for on-line searching and retrieval. Project management skills are also developed in the course. Offered in a six-week period.

**MIS 541 Introduction to Management Information Systems**

★1.5 (fi 3) (either term, 18 hours). This course is designed to equip students with a basic knowledge and understanding of the management of information systems in modern organizations and to prepare them to function as knowledge workers in the information age. The course has three modules: the strategic importance of information technology, the development and implementation of an information technology plan and the basic components of the information technology infrastructure. Each module concludes with a case discussing the main points with which managers must be concerned. Offered in a six-week period.

**MIS 586 Selected Topics in Management Information Systems**

★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.

**MIS 611 Seminar in Information Systems**

★3 (fi 6) (either term, 3-0-0). The seminar will consider a wide range of topics concerned with information systems. These will include technology and file systems, data modelling, databases, expert systems, systems analysis and systems development life cycle, as well as the organizational and behavioral issues connected with the structure and efficiency of organizations. The seminar will also help students to develop analytical skills which can be brought to bear on MIS problems. Prerequisites: MGTSC 502 and MGTSC 514.

**MIS 612 Developing Management Information Systems**

★3 (fi 6) (either term, 3-0-0). This course will explore how information technology can be used to support the efficiency and effectiveness of management decision-making. It will discuss the fundamentals of four information technologies that have a direct impact on management: (1) decision support systems, (2) group decision support systems, (3) executive information systems, and (4) knowledge-based expert systems. While the focus will be on how these technologies are constructed and used by managers, integrative cases will be used to analyze issues such as how new managerial technology should be introduced into organizations and how managerial work is being transformed by modern information technology.

**MIS 613 Systems Analysis and Design**

★3 (fi 6) (either term, 3-0-0). An examination of the critical stages of the traditional systems development life cycle. Determination and analysis of management information system requirements and translation into detailed design specifications including technical and managerial aspects of systems analysis, design, and implementation; general structure of organizational information systems and major characteristics of common management information system applications. Concepts of life cycle, analysis and design tools and techniques are also presented. Behavioral aspects of management information system implementation are considered. Prerequisite: MIS 611.

**MIS 614 Information Systems Management**

★3 (fi 6) (either term, 3-0-0). The course considers problems of administering and managing computer-based information systems, and managerial techniques for prevention and resolution of such problems, using case studies and guest lectures. Cases are large in scope and integrative rather than focusing on one discipline. Management issues in developing an effective interface between the information systems function and user groups in an organization are also discussed. Prerequisite: MIS 611.

**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.

**201.134 Management Science, MGTSC**

Department of Finance and Management Science  
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 301 Probability and Statistics for Business, Part I

★3 (fi 6) (either term, 3-0-0). This course introduces managerial applications of probability, random variables, expectations and variance, normal and other distributions, analysis display, and presentation of information. Spreadsheets will be an important tool throughout the course and extensive computer use will be required. Therefore students should already possess basic familiarity with microcomputer applications. This course begins with an overview of spreadsheets. Prerequisite: MATH 113 or 114.

### MGTSC 312 Probability and Statistics for Business, Part II

★3 (fi 6) (either term, 3-0-0). 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.

### 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. Prerequisite: MGTSC 312.

### MGTSC 405 Forecasting for Planners and Managers

★3 (fi 6) (either term, 3-0-0). Every decision rests upon a forecast. This course examines statistical procedures for forecasting time series, matching the forecasting method to the setting, and assessment of forecast accuracy. Topics covered include forecasting single and multiple time series, the optimal combination of forecasts, adjusting for unmeasured events, and how to compensate for low quality data series. The emphasis is on the manager as forecaster. The objective of the course is to provide the individual with the skills necessary to produce the best possible forecasts from the sources at hand. The analysis and forecasting of series from finance, economics, marketing, accounting, and other areas relevant to business will be required. Prerequisite: MGTSC 312.

### MGTSC 422 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; implementation using various computer languages; case studies. Microcomputer applications will be particularly emphasized. Prerequisite: MGTSC 352.

### MGTSC 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. Prerequisite: MGTSC 352 or instructor's permission.

### MGTSC 428 Environmental Operations Management

★3 (fi 6) (either term, 3-0-0). Decision-support models for managerial decisions with environmental impact. Examination of issues such as energy planning, water resource choices, and hazardous waste logistics with management science tools. Multicriteria decision-making will be introduced and applied. Prerequisites: MGTSC 352.

### MGTSC 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. Prerequisite: MGTSC 312.

### MGTSC 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: MGTSC 352 or Instructor's permission.

### MGTSC 463 Problem Solving

★3 (fi 6) (either term, 3-0-0). The focus of this course is on solving difficult business problems using relatively simple computational techniques. The problems will come from different functional areas of business with an emphasis on operations. The common characteristics of these problems are a large number of possible solutions, difficulty in selecting the best solution, and a level of complexity that does not allow for simple analytic solutions. The course's quick-and-dirty (heuristic) solution techniques will be implemented on microcomputers. Prerequisite: MGTSC 352 or Instructor's permission.

### MGTSC 465 Management of New Technology

★3 (fi 6) (either term, 3-0-0). In many firms, new technology has the potential to increase competitive advantage. This course looks at the development of products and services which embody new scientific and technical information, and the incorporation of up-to-date technical information in manufacturing and distribution systems. The main thrust of the course will be decisions on the profitable development and adoption of new technology, but there will also be some consideration of policies for government-business cooperation in stimulating and using new inventions and discoveries. The course will include a mix of cases and lectures designed to focus on the significant ways in which new technology can increase profit potential. Prerequisite: MGTSC 352 or Instructor's permission.

### MGTSC 488 Selected Topics in Management Science

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

### MGTSC 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.

### MGTSC 496 Individual Research Project II

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

### MGTSC 497 Individual Research Project III

★3 (fi 6) (either term, 3-0-0). Special Study for advanced undergraduates. Prerequisites: MGTSC 496, consent of the Instructor and Assistant Dean, Undergraduate Program.

## Graduate Courses

### MGTSC 511 Data Analysis

★1.5 (fi 3) (either term, 18 hours). This course begins with a survey of graphical and numerical techniques available for studying and describing data. A statistics computer software package is used. Following an introduction to probability distributions, an overview of statistical inference for means and proportions is provided. The emphasis will be on the application of these techniques to managerial decision making. Offered in a six-week period.

### MGTSC 521 Statistical Models

★1.5 (fi 3) (either term, 18 hours). This course is concerned with statistical inference techniques for various models. Regression, analysis of variance, and time series models are discussed. Statistical computer software is used to apply the techniques to business data sets. The data analyzed throughout the course will be representative of data commonly employed by managers. Offered in a six-week period. Corequisite: MGTSC 511.

### MGTSC 531 Decision Analysis

★1.5 (fi 3) (either term, 18 hours). This course provides an overview of probability theory. A survey of decision theory, computer simulation and central management science concepts and techniques is included. The student is introduced to concepts using a variety of cases and assignments. Formulation of problems and interpretation of results are stressed. Computer spreadsheet software is used throughout. Offered in a six-week period. Not open to students who have completed MGTSC 501. Prerequisite: MGTSC 521.

### MGTSC 541 Production and Operations Management

★1.5 (fi 3) (either term, 18 hours). This course focuses on the creation and delivery of goods and services. The emphasis is on the analytical solution methods for strategic and tactical decisions. Specific modules may include forecasting, project management, facility location, aggregate planning, scheduling, inventory management, distribution and transportation. A number of cases will be introduced and models of realistic problems will be implemented on microcomputers.

### MGTSC 586 Selected Topics in Management Science

★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.

### MGTSC 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. Prerequisite: MGTSC 501 and MANEC 501.

#### **MGTSC 614 Applied Time Series Analysis**

★3 (fi 6) (either term, 3-0-0). This course is designed to develop an understanding of statistical modelling techniques used in forecasting business time series. The emphasis is on ARIMA modelling of univariate and multiple time series. Computer programs are used to apply the models to series from a wide range of business areas. Additional topics may include intervention analysis, forecast evaluation, causality analysis, combining forecasts, and nonlinear models. Prerequisite: MGTSC 514 or equivalent.

#### **MGTSC 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. Prerequisite: MGTSC 501, 511, 521 or Instructor's permission.

#### **MGTSC 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: MGTSC 514 or equivalent.

#### **MGTSC 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.

#### **MGTSC 661 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: MGTSC 501, 511, 521 or Instructor's permission.

#### **MGTSC 663 Problem Solving**

★3 (fi 6) (either term, 3-0-0). The focus of this course is on solving difficult business problems using relatively simple computational techniques. The problems will come from different functional areas of business with an emphasis on operations. The common characteristics of these problems are a large number of possible solutions, difficulty in selecting the best solution, and a level of complexity that does not allow for simple analytic solutions. The course's quick-and-dirty (heuristic) solution techniques will be implemented on microcomputers. Prerequisite: MGTSC 501, 511, 521 or Instructor's permission.

#### **MGTSC 665 Management of New Technology**

★3 (fi 6) (either term, 3-0-0). In many firms, new technology has the potential to increase competitive advantage. This course looks at the development of products and services which embody new scientific and technical information, and the incorporation of up-to-date technical information in manufacturing and distribution systems. The main thrust of the course will be decisions on the profitable development and adoption of new technology, but there will also be some consideration of policies for government-business cooperation in stimulating and using new inventions and discoveries. The course will include a mix of cases and lectures designed to focus on the significant ways in which new technology can increase profit potential. Prerequisite: MGTSC 501, 511, 521 or Instructor's permission.

#### **MGTSC 675 Environmental Operations Management**

★3 (fi 6) (either term, 3-0-0). Decision-support models for managerial decisions with environmental impact. Examination of issues such as energy planning, water resource choices and hazardous waste logistics with management science tools. Multicriteria decision making will be introduced and applied.

#### **MGTSC 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.

#### **MGTSC 698 Individual Study Project in Management Science**

★3 (fi 6) (either term, 3-0-0).

#### **MGTSC 701 Seminar in Mathematical Programming**

★3 (fi 6) (either term, 3-0-0). Topics from the areas of linear programming, non-linear programming, quadratic programming, integer programming, stochastic programming, network analysis, and large-scale programming (decomposition and column generation) in a business context. Prerequisite: consent of Department.

#### **MGTSC 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. Prerequisite: consent of Department.

#### **MGTSC 703 Advanced Applications of Operations Research**

★3 (fi 6) (either term, 3-0-0).

#### **MGTSC 704 Seminar in Stochastic Systems**

★3 (fi 6) (either term, 3-0-0). Topics from the areas of Markov processes, queuing, stochastic dynamic programming, and simulation in a business context. Prerequisite: consent of Department.

#### **MGTSC 705 Multivariate Data Analysis I**

★3 (fi 6) (either term, 3-0-3).

#### **MGTSC 706 Multivariate Data Analysis II**

★3 (fi 6) (either term, 3-0-3).

#### **MGTSC 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.

#### **MGTSC 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.

## 201.135 Marine Science (Biological Sciences), MA SC

Department of Biological Sciences  
Faculty of Science

#### **Notes**

- (1) Courses are offered at Bamfield Marine Station (BMS). 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) See also §172.10.

### 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 distinguished scientists who are working at the Bamfield Marine Station. It is expected that the course will generally be of a specialized nature and be at a level appropriate to graduate or senior undergraduate students.

#### **MA SC 402 Special Topics in Marine Biology**

★3 (fi 6) (either term, 0-0-6). Offered, as opportunities arise, by distinguished scientists who are working at the Bamfield Marine Station and are prepared to offer a course extending over a three-week period. Course will be of a specialized nature.

#### **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 Station. The course includes lectures, laboratory periods, 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.

**MA SC 415 Structure and Function in Animals**

★3 (*fi 6*) (first term, 4 weeks). This course is intended to examine the form and function of invertebrates and vertebrates using a comparative approach. The following subject areas will be included: morphology and evolution, systems physiology, biomechanics, and development. The local marine and coastal fauna will be used to illustrate the principles. The course will include fieldwork and a series of laboratory exercises and experiments.

**MA SC 420 Marine Phycology**

★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 Station. The course includes lectures, laboratory periods, field collection, identification, and observation. Emphasis is placed on the study of living specimens in the laboratory and in the field.

**MA SC 425 Ecological Adaptations of Seaweeds**

★3 (*fi 6*) (first term, 4 weeks). The course will explore morphological, physiological, genetic and reproductive adaptations of seaweeds to their natural and man-altered environments.

**MA SC 430 Marine Ecology**

★6 (*fi 12*) (two term, 0-0-6). An analytical approach to biotic associations in the marine environment. Opportunities 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 Station; plankton studies and investigations of the subtidal and benthic environments by diving and dredging are envisaged.

**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.

**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.

**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 periods and the course will involve an independent field study.

**MA SC 450 Principles of Aquaculture**

★3 (*fi 6*) (either term, 0-0-6). An interdisciplinary introduction to the principles underlying the commercial cultivation of aquatic plants and animals emphasizing marine systems. The course will include working site-visits to a range of commercial farms and R & D facilities.

**MA SC 470 Directed Research in Aquaculture**

★3 (*fi 6*) (either term, 0-0-6). Design and execution of a research project in the field of aquaculture under the supervision of a scientist working in association with the Bamfield Station. A written report is a requirement.

**MA SC 480 Seminars and Papers in Marine Science**

★3 (*fi 6*) (first term, 13 weeks). A series of weekly seminars covering current topics of interest in the marine sciences. Seminars will be presented by BMS 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.

**201.136 Marketing, MARK**

Department 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****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 101/102, MATH 113 or equivalent.

**MARK 412 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.

**MARK 422 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 422 and CONS 220.

**MARK 423 Advanced Topics in Consumer Behavior**

★3 (*fi 6*) (either term, 3-0-0). Advanced study of consumer behavior theories and their application to consumer research that informs marketing, consumer policy, and consumer education. Prerequisite: MARK 422 or CONS 220. BCom degree credit will not be granted for both MARK 423 and CONS 420.

**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 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.

**MARK 465 Retailing and Services Internship**

★3 (*fi 6*) (either 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 is 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 Marketing Policies and Problems**

★3 (fi 6) (either term, 3-0-0). Special topics in marketing, to be announced in advance by the instructor. Prerequisite: MARK 301.

**MARK 495 Individual Research Project I**

★3 (fi 6) (either term, 3-0-0). Special study for advanced undergraduates. Prerequisites: MARK 412 or equivalent, consent of Instructor and Assistant 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 501 Principles of Marketing**

★1.5 (fi 3) (either term, 18 hours). This course covers basic concepts in marketing, including marketing orientation, relationship marketing, the marketing research process, consumer vs industrial marketing, uncontrollable vs controllable variables, market segmentation, and development of a marketing plan. The course also introduces marketing in special contexts such as not-for-profit, international, services, and environmental. Offered in a six-week period.

**MARK 511 Marketing Management**

★1.5 (fi 3) (either term, 18 hours). This course addresses in detail the concept of the marketing mix: product, price, place, and promotion. While each of these elements is covered separately, the need to synchronize them is emphasized. The course focuses on implementing the marketing mix. Offered in a six-week period. Prerequisites: MARK 501, MANEC 501.

**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 615 Quantitative Marketing Management**

★3 (fi 6) (either term, 3-0-0). An introduction to quantitative modelling in marketing applying tools drawn from management science, statistics, economics, and accounting to marketing problems. Computer use is an integral part of project assignments. Prerequisite: MARK 502.

**MARK 620 Marketing Research and Consumer Behavior**

★3 (fi 6) (either term, 3-0-0). This course 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. Consideration is also given to individual and group influences on consumer decision making and their implications for marketing strategy. Prerequisite: MARK 502 or 511.

**MARK 630 Advertising, Promotion and Retail Management**

★3 (fi 6) (either term, 3-0-0). This course introduces the student to the management of advertising and other marketing communications tools in a managerial setting. It also examines the application of marketing analysis to retail management with emphasis on locations/spatial theory, market research techniques, consumer behavior, channel policies, competition analysis, and pricing, merchandising, and promotion strategies. Prerequisite: MARK 502 or 511.

**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. Prerequisites: MARK 501, 511.

**MARK 654 Strategic Marketing**

★3 (fi 6) (either term, 3-0-0).

**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 501, 511, MANEC 511.

**MARK 686 Selected Topics in Marketing**

★3 (fi 6) (either term, 3-0-0).

**MARK 701 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. Prerequisite: MARK 614 or equivalent.

**MARK 702 Buyer Behavior**

★3 (fi 6) (either term, 3-0-0). In-depth study and analysis of the current buyer behavior research literature. Models of individual and group (organizational) buying processes. Information processing views of consumer decision making. Models of attitudes, perceptions, preferences, and choice. The use of advanced econometric and psychometric techniques in analyzing buyer behavior. Prerequisite: MARK 624 or equivalent.

**MARK 703 Marketing Modelling**

★3 (fi 6) (either term, 3-0-0).

**MARK 704 Individual Research**

★3 (fi 6) (either term, 3-0-0).

**MARK 705 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.

**MARK 830 Marketing**

★3 (fi 32) (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.

**201.137 Materials Engineering, MATE**

Department of Chemical and Materials Engineering  
Faculty of Engineering

The following table lists renumbered courses effective 1997/98:

Old	New	Old	New
MET E 251	MATE 251	MET E 543	MATE 543
MET E 252	MATE 252	MET E 555	MATE 555
MET E 256	MATE 256	MET E 601	MATE 601
MMP E 331	MATE 331	MET E 610	MATE 610
MET E 332	MATE 332	MET E 611	MATE 611
MET E 340	MATE 340	MET E 615	MATE 615
MET E 353	MATE 353	MET E 630	MATE 630
MET E 357	MATE 357	MET E 645	MATE 645
MET E 358	MATE 358	MET E 651	MATE 651
MET E 380	MATE 480	MET E 652	MATE 652
MMP E 390	MATE 390	MET E 653	MATE 653
MMPE 408	MATE 408	MET E 654	MATE 654
MET E 430	MATE 430	MET E 660	MATE 660
MET E 434	MATE 434	MET E 662	MATE 662
MET E 441	MATE 441	MET E 664	MATE 664
MET E 442	MATE 442	MET E 665	MATE 665
MET E 443	MATE 443	MET E 666	MATE 666
MET E 444	MATE 444	MET E 668	MATE 668
MET E 445	MATE 345	MET E 676	MATE 676
MET E 448	MATE 448	MET E 680	MATE 680
MET E 452	MATE 452	MET E 682	MATE 682
MET E 453	MATE 453	MET E 738	MATE 738
MET E 467	MATE 467	MET E 778	MATE 778
MET E 533	MATE 533		

**Undergraduate Courses****MATE 251 Materials Science I**

□3 (fi 6) (either term, 3-0-0). An introduction to the science of materials from

the standpoint of the relationships between structure and physical and mechanical properties. Atomic bonding, crystal structure and crystal imperfections, binary phase equilibria and phase transformations. Structures of metallic, non-metallic and composite materials. Elastic and plastic deformation, fracture, fatigue and creep in crystalline and amorphous solids. Corrosion and thermal stability of materials in service. Prerequisite: CHEM 105 or consent of Department. (★3)

#### **MATE 252 Materials Science II**

□3.8 (fi 6) (either term, 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. Prerequisite: CHEM 105. (★3)

#### **MATE 256 Materials Engineering**

□3.8 (fi 6) (second term, 3-0-3/2). Elements of crystallography, x-ray diffraction, and applications in materials. Transmission and scanning electron microscopy as applied to materials. Metallography. Vacancies, introduction to dislocations and grain boundaries in metals. Introduction to powder metallurgy. Polymers and their application in materials engineering. Prerequisite: MATE 252 or equivalent. (★3)

#### **MATE 331 Mineral Processing I**

□3.8 (fi 6) (second 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. Prerequisite: consent of Instructor. (★3)

#### **MATE 332 Pyrometallurgy**

□3.8 (fi 6) (second term, 3-0-3/2). Nature of ores, furnaces fuels, slags, and mattes. Metallurgical calculations. Application of thermodynamics to metallurgical unit processes involving the use of elevated temperature to extract metals and metal compounds including calcining, roasting, reduction, smelting, refining and recycling. Air pollution problems in metallurgical industries. Prerequisites: CH E 265 and MAT E 340. (★3)

#### **MATE 340 Materials Thermodynamics**

□3 (fi 6) (first term, 3-0-0). Fundamentals of thermodynamics in metallurgy and materials. Review of thermodynamic variables. First and second laws. Reaction equilibria, stability diagrams. Solution thermodynamics applied to metallurgical processes. Phase relations, free energy-composition diagrams. Electrochemistry. Experimental methods and estimation of thermochemical data. Prerequisite: CH E 243. (★3)

#### **MATE 343 Mechanical Design for Materials Engineers**

□3.5 (fi 6) (second term, 2-0-3). Analysis and design of components including materials selection. Basic principles of designing and manufacturing components for common industrial devices such as fasteners, pressure vessels, gears, etc. Design project. Prerequisite: CIV E 270, MEC E 265 or CIV E 265, MATE 357. Corequisite: MATE 345, MATE 358. (★3)

#### **MATE 345 Corrosion and Oxidation**

□3 (fi 6) (either term, 3-0-0). Electrochemical theory of galvanic attack, concentration cells and differential temperature cells. Uniform attack. The interaction of mechanical stresses and corrosion. Selection of corrosion-resistant materials. Protective coatings, inhibitors and cathodic protection, corrosion testing, high-temperature oxidation and other gas-metal reactions. Not open to students with credit in MATE 445. Prerequisite: MATE 251 or 252. (★3)

#### **MATE 353 Electronic Materials I**

□3 (fi 6) (first term, 3-0-0). The science of electronic materials relating atomic, molecular and crystal structure to material properties; polymers, glasses, crystalline ceramics, metals, and composites; diffusion, electrochemical and corrosion properties; phase equilibria, strengthening mechanisms, mechanical properties and failure; electrical conductors, semiconductors, and dielectrics; thermal, magnetic, and optical properties. Prerequisite: CHEM 105. Not open to students with credit in MATE 251 or MATE 252. (★3)

#### **MATE 357 Fundamentals of Physical Metallurgy**

□4.5 (fi 6) (first term, 3-0-3). Diffusion in metals. Phase diagrams. Solidification. Solid state phase transformations. Aluminium alloys, properties and selection. Displacive transformations. Carbon and low alloy steels and their heat treatment. Prerequisite: MATE 256. (★3)

#### **MATE 358 Mechanical Metallurgy and Electronic Materials**

□3.8 (fi 6) (second term, 3-0-3/2). Elasticity, tensile testing and stress strain relationship. Introduction to the dislocation glide and plastic deformation. Strengthening mechanisms in metals. Aluminium alloys. Fundamentals of fracture. Fatigue and creep. Introduction to electronic materials. Prerequisite: MATE 256. (★3)

#### **MATE 365 Materials Process Engineering Design I**

□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. Prerequisites: CH E 265, MEC E 310 and MATE 340. Corequisite: CH E 314. (★3)

#### **MATE 390 Introduction to Process Simulation**

□3.5 (fi 6) (first term, 3-1s-0). Simulation methods are developed and applied to systems. Topics include probabilistic, deterministic, and numerical simulations of physical processes commonly encountered in mining, metallurgical, and petroleum engineering. Prerequisite: ENCMP 100, MATH 102, 201 and 209. (★3)

#### **MATE 408 Environmental Aspects of Resource Operations**

□3 (fi 6) (second term, 3-0-0). Environmental impacts of mining, mineral processing, and extractive metallurgical operations. Abatement technology. Public response and environmental legislation. Safe disposal of wastes from resource industries. Land reclamation and revegetation methods. Case studies of typical Canadian resource industries. Prerequisite: MATE 331 or consent of Instructor. (★3)

#### **MATE 430 Hydrometallurgy and Electrometallurgy**

□3.8 (fi 6) (first term, 3-0-3/2). Principles of hydrometallurgical and electrometallurgical unit processes to recover metals and metal compounds. Application of thermodynamics and kinetics to atmospheric and pressure leaching, ion exchange, solvent extraction, hydrogen reduction, electrowinning and electrorefining. Water pollution problems in metallurgical industries. Prerequisites: CH E 265 and MATE 340. (★3)

#### **MATE 433 Applied Surface Chemistry in Minerals and Materials Processing**

□3.5 (fi 6) (either term, 3-1s-0). 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 surface characterization. Prerequisite CH E 243 or equivalent. Credit cannot be obtained in this course if credit has already been obtained in CH E 436. (★3)

#### **MATE 434 Metallurgical Process Analysis**

□3.8 (fi 6) (second term, 3-0-3/2). The analysis, optimization and control of mineral and metallurgical processing systems through mathematical modelling and digital simulation. Instrumentation and control of metallurgical processing plants. Prerequisite: MATE 331, 332 or 390. (★3)

#### **MATE 440 Kinetics and Mass Transfer**

□3 (fi 6) (second term, 3-0-0). 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. Prerequisites: MATE 340, CH E 312, CH E 314 (★3)

#### **MATE 441 Materials Research Project I**

□0.5 (fi 2) (either term, 0-1s-0). 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. Corequisite: CH E 481. Requires consent of instructor. (★1)

#### **MATE 442 Materials Research Project II**

□3 (fi 6) (either term, 0-0-6). Execute research according to research proposal prepared in MATE 441. Write research report. Prerequisite: MATE 441. (★3)

#### **MATE 443 Materials Design Project**

□4 (fi 6) (second 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. Prerequisites: CIV E 270, MATE 452. (★3)

#### **MATE 448 Materials Engineering Field Trip**

□0.5 (fi 1) (either term, 0-1s-0). An extended trip to visit materials and metallurgical plants is made at the end of the summer by fourth-year Materials Engineering students accompanied by staff. Students in Materials may also be required to make several part-day trips during the session to materials, metallurgical and other industrial plants near Edmonton. This course requires the payment of additional miscellaneous fees. See §22.2.3 for details. Prerequisite: MATE 357. (★0.5)

#### **MATE 452 Applications of Physical Metallurgy**

□4.5 (fi 6) (first term, 3-0-3). Composition, structure, heat treatment and mechanical properties of alloy steels, cast irons and non-ferrous alloys excepting aluminium. Mechanical processing of metals, including stress-strain relationships, forging, rolling, extrusion and sheet metal forming. Metallurgy of machining. Prerequisite: MATE 357. (★3)

#### **MATE 465 Materials Process Engineering Design II**

□4 (fi 6) (second term, 1-0-6). Integration of materials process engineering practice, theory and economics into the design and evaluation of proposed capital projects. Prerequisites: MATE 365 and MATE 340. Corequisite: MATE 440. (★3)

#### **MATE 467 Polymers and Fibre Reinforced Polymers**

□3.5 (fi 6) (either term, 3-1s-0). Introduction. Structure and behavior of polymers. Polymer processing techniques. Stiffness and strength of polymers. Fracture of polymers. Fibre-polymer composites. Fluid flow and heat transfer in melt processing. Interactions of processing and properties. Polymer adhesives. Prerequisite: MATE 252 or equivalent. (★3)

**MATE 480 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. Not open to students with credit in MATE 380. Prerequisite: MATE 357 or consent of instructor. (★3)

**MATE 533 Mineral Processing II**

□2.8 (*fi 4*) (either term, 2-0-3/2). Chemical and mineralogical analyses of ores, metallurgical testing, process evaluation, flowsheet development and economic evaluation. Prerequisite: MATE 331. (★2)

**MATE 543 Special Topics in Metallurgy**

□3 (*fi 6*) (either term, 3-0-0). Physical and chemical principles underlying metallurgical topics of current interest such as composite materials, materials problems in energy conversion, electrofinishing, recycling, extraction of metals from fossil fuels, iron and steelmaking, and refractory-slag interactions. (★3)

**MATE 555 Special Topics in Metal Processing**

□3 (*fi 6*) (second term, 3-0-0). Studies of the metallurgical background of specific metal processing techniques which are of current interest. Prerequisite: MATE 452 or 350. (★3)

**Graduate Courses****MATE 601 Research Techniques in Metallurgy**

□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. (★3)

**MATE 610 Welding Metallurgy**

□3.8 (*fi 6*) (second term, 3-0-3/2). Heat flow. Effect of welding thermal cycles on weld joints. Weld metal solidification. Metallurgical changes during solidification. Heat-affected zones. Residual stresses and distortion. Ferrous alloy metallurgy. Nonferrous alloy metallurgy. Dissimilar metal joints. Metallurgy of brazing and soldering. Prerequisite: MATE 452 or equivalent. (★3)

**MATE 611 Welding Processes**

□3.8 (*fi 6*) (first term, 3-0-3/2). Process classification and selection. Welding heat sources. Heat transfer, metal transfer, gas-metal and slag-metal reactions. Power source characteristics. Analysis of industrial arc welding processes. Cutting processes. Surfacing and metal spraying. Resistance welding. Solid phase bonding. Brazing and soldering. Welding of plastics. Adhesive bonding. Prerequisite: consent of Instructor. (★3)

**MATE 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: MATE 610 and 611 or consent of Instructor. (★3)

**MATE 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. (★3)

**MATE 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 MATE 433. (★3)

**MATE 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: MATE 430 or consent of Instructor. (★3)

**MATE 651 High-Temperature Oxidation**

□3 (*fi 6*) (first term, 3-0-0). Lattice defects and diffusion in crystals. Theories of metal oxidation mechanisms. Mechanisms of alloy oxidation. Oxidation by gases other than oxygen. Experimental research methods. Protection of metal surfaces from oxidation. Prerequisite: MATE 445 or consent of Instructor. (★3)

**MATE 652 Soil Corrosion and its Prevention**

□3 (*fi 6*) (second term, 3-0-0). The chemical and physical character of soils; soil

surveys and tests; estimation of corrosivity. Types of corrosion, including microbial corrosion, stray currents, stress corrosion. Detecting corrosion with potential measurements, line current, and earth current measurements. Methods of reducing corrosion. Cathodic protection principles, design, testing and measurement. Cathodic equipment and problems. Corrosion control management and economics. Prerequisite: MATE 445 or consent of Instructor. (★3)

**MATE 653 Stress Corrosion Cracking**

□3 (*fi 6*) (first 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: MATE 445 or consent of Instructor. (★3)

**MATE 654 Electrochemical Theory of Corrosion**

□3 (*fi 6*) (second 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: MATE 445 or consent of Instructor. (★3)

**MATE 660 Metallurgical Applications of X-rays**

□3 (*fi 6*) (either term, 3-0-0). Production and detection of x-rays; x-ray fluorescence spectroscopy; electron probe microanalysis; interaction of x-rays with crystals; reciprocal lattice construction; single crystal diffraction patterns; powder diffractometry and measurement of preferred orientations, stress, particle size, etc.; x-ray absorption microscopy; x-ray diffraction microscopy. Prerequisite: MATE 357 or consent of Instructor. (★3)

**MATE 662 Fracture of Metals**

□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: MATE 350, 358, or consent of Instructor. (★3)

**MATE 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. (★3)

**MATE 665 Materials Applications of Transmission Electron Microscopy**

□4.5 (*fi 6*) (either term, 3-0-3). Principles and design of the transmission electron microscope, specimen preparation, electron diffraction, image contrast theory, introduction to analytical electron microscopy. Applications to defects in metallic and non-metallic crystalline materials. Prerequisite: MATE 358 or consent of Instructor. (★3)

**MATE 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: MATE 358 or consent of Instructor. (★3)

**MATE 668 Colloidal Ceramics Processing**

□3 (*fi 6*) (first term, 3-0-0). Principles and application of colloidal materials to the fabrication of advanced ceramics. Synthesis of fine powders, sols and gels; study of their properties, phase transformation and sintering behavior during heat treatment. Colloidal ceramics composites. Prerequisite: MATE 380 or consent of Instructor. (★3)

**MATE 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. (★3)

**MATE 680 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: MATE 332 and 357 or consent of Instructor. (★3)

**MATE 682 Graduate Seminar**

□0.5 (*fi 2*) (variable, 0-1s-0). Discussion of progress and problems in research under way in the metallurgical area. Graduate students are required to attend and to give a seminar related to their research. (★1)

**MATE 738 Process Metallurgy**

□3 (*fi 6*) (either term, 3-0-0). (★3)

**MATE 778 Physical Metallurgy**

□3 (*fi 6*) (either term, 3-0-0). (★3)



**MATE 900 Directed Research**

★6 (fi 12) (variable, unassigned). An engineering project for students registered in a Master of Engineering program.

**201.138 Mathematical Physics, MA PH**

Department of Mathematical Sciences  
Department of 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.

**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. Corequisite: MATH 215 or 317.

**MA PH 451 Mathematical Methods of Physics I**

★3 (fi 6) (first 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: PHYS 372 and 381. Corequisite: PHYS 481.

**MA PH 453 Mathematical Methods of Physics II**

★3 (fi 6) (second term, 3-0-0). Group representation theory and applications to problems in physics; spectral theory for matrices; application to the theory of resolvents and their relation to Green's functions; calculus of variations; integral representations of special functions. Prerequisite: MA PH 451.

**MA PH 467 Mechanics of Deformable Media**

★3 (fi 6) (second term, 3-0-0). Stress and strain in continuous media; elasticity; mechanics of fluid flow in two dimensions using complex variables; three dimensional fluid flow using Eulerian and Lagrangian reference frames; thermodynamics and mechanics of compressible and viscous flows; onset of turbulence, convection, and instability. Examples from geophysics, oceanography, and atmospheric physics. Prerequisites: PHYS 211, MATH 334, MA PH 343, and MATH 411 or 311.

**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, 453, 467, 468.

**MA PH 669 General Relativity**

★6 (fi 12) (two term, 3-0-0). Algebraic analysis of the field equations, Cauchy initial value problem, gravitational radiation, algebraically special fields, conservation laws, gravitational collapse and black holes. Relativistic astrophysics, cosmological models, global structure of space-time. Prerequisite: MATH 446 or consent of both Departments.

**201.139 Mathematics, MATH**

Department of Mathematical Sciences  
Faculty of Science

**Notes**

- (1) MATH 100, 101, 102, 201, 209, 300, 301, 311 are open to Engineering students only.
- (2) See Mathematical Physics (MA PH) listing for courses offered jointly by the Physics and Mathematics Departments.
- (3) See also Mathematical Physics (MA PH) listing.

**Undergraduate Courses****MATH 100 Calculus I**

□4.0 (fi 6) (either term, 3-0-2). Rectangular and polar coordinates, analytic geometry. Transcendental functions, limits, continuity, derivatives and applications. Taylor polynomials. Integration and applications. Prerequisites: Pure Mathematics

30 and 31. Notes: (1) This course may not be taken for credit if credit has already been obtained in MATH 113, 114, or 117. (2) Students in all sections of this course will write a common final examination. (3) Restricted to Engineering students. (★3)

**MATH 101 Calculus II**

□3.5 (fi 6) (either term, 3-0-1). Applications of integration to lengths, areas, volumes, and masses. Inverse trigonometric and hyperbolic functions. Methods of integration, polar and parametric equations. Vector functions and derivatives. Prerequisite: MATH 100. Notes: (1) This course may not be taken for credit if credit has already been obtained in either MATH 115 or 118. (2) Students in all sections of this course will write a common final examination. (3) Restricted to Engineering students. (★3)

**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. (★3)

**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 equivalent. Students who have taken Mathematics 31 are advised to take MATH 114. This course may not be taken for credit if credit has already been obtained in MATH 100, 114 or 117.

**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, Mathematics 31 or equivalent. This course may not be taken for credit if credit has been obtained in MATH 100, 113 or 117.

**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 or 118.

**MATH 117 Honors Calculus I**

★3 (fi 6) (first term, 4-0-0). Functions, continuity, and the derivative. Applications of the derivative. Integration and the Fundamental Theorem. Prerequisite: Pure Mathematics 30 and 31 or their equivalents. Notes: This course is designed for students with at least a 75 percent grade in Pure Mathematics 30. 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, or 114.

**MATH 118 Honors Calculus II**

★3 (fi 6) (second term, 4-0-0). Techniques and applications of integration. Derivatives and integrals of the exponential, and trigonometric functions. Extended limits and l'Hospital's rule. 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 or 115.

**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. 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.

**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. 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 who did well in Pure Mathematics 30 and all students who did well in Mathematics 31. 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 153 Mathematics of Finance I**

★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. Note: This course may not be taken for credit if credit has already been obtained in MATH 253.

**MATH 160 Higher Arithmetic**

★3 (fi 6) (either term, 3-0-0). Elementary Number Theory, Numeration Systems, Number Systems and Elementary Probability Theory. Prerequisite: MATH 30 or consent of Department. Note: This course is restricted to Elementary Education students.

**MATH 201 Differential Equations**

□3.5 (fi 6) (either term, 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, Specialization Computing Science, or Specialization Geography (Meteorology). (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. (★3)

**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. (★3)

**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  $\mathbb{R}^n$ . Sequences, limits and continuity. Multiple integration. Differential calculus; the chain rule. Note: This course is intended for second year Honors students in Mathematics and Physics. Other students admitted only with the consent of Department. Prerequisites: MATH 118 or MATH 115 and MATH 216. Corequisite: MATH 120 or 125 (or 127).

**MATH 220 Linear Algebra III**

★3 (fi 6) (either term, 3-0-0). Diagonalization and triangulization of matrices, Jordan canonical form, application to differential equations, spectral theorem, quadratic forms, orthogonal operators. Prerequisite: MATH 121 or equivalent.

**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, MATH 120 or 125 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. Prerequisite: MATH 120 or 125 or any linear algebra course, Mathematics 31 or any calculus course. Note: This course cannot be taken for credit if credit has already been obtained in MATH 121 or 227.

**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: MATH 120 or 125 or any linear algebra course. Note: This course cannot be taken for credit if credit has already been obtained in MATH 128 or 223.

**MATH 229 Algebra: 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 2 and 3 dimensions. Groups of

matrices. Group actions with application to counting problems. Permutation groups. Subgroups, cosets, and Lagrange's Theorem. Quotient groups and homomorphisms. Prerequisite: MATH 120 or 125 or any linear algebra course.

**MATH 241 Geometry**

★3 (fi 6) (first 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.

**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

**MATH 253 Theory of Interest**

★3 (fi 6) (first term, 3-0-0). Accumulation and amount functions. Effective, simple, compound rates. Force of interest. Discount. Annuities certain, simple and general. Perpetuities. Amortization schedules and sinking funds. Bonds and other securities. Applications: valuation of securities, instalment loans, depreciation, depletion, capitalized cost. Prerequisite: MATH 115 or equivalent.

**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 280 Numerical Methods I**

★3 (fi 6) (first term, 3-0-1). Calculus of finite differences, iterations. Methods of solving non-linear equations. Approximation of functions by Taylor series, Newton's Formulas, Lagrange and Hermite Interpolation. Splines. Elementary methods for numerical evaluations of integrals and direct methods for solving linear systems of equations. Prerequisite: MATH 214 or equivalent, MATH 120 or 125 or equivalent. Note: Credit cannot be obtained for both MATH 280 and any of CMPUT 319, 340, or 358.

**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. (★3)

**MATH 309 Mathematical Methods for Electrical Engineers**

★3 (fi 6) (second 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.

**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. Inverse Laplace transforms. Prerequisite or corequisite: MATH 201 or 215.

**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. Prerequisites: MATH 209, 215 or equivalent.

**MATH 317 Honors Advanced Calculus II**

★3 (fi 6) (second term, 4-0-0). Differential calculus, Taylor's formula, maxima and minima. Transformations of multiple integrals. Line integrals, theorems of Green, Gauss and Stokes. Sequences and Series. Uniform convergence. Improper integrals. Prerequisite: MATH 217.

**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.

**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).

**MATH 325 Algebra: Vector Spaces and Modules**

★3 (fi 6) (second term, 3-0-0). Abstract vector spaces. Modules over a principal ideal domain. Finitely generated abelian groups. Linear transformations, the Jordan canonical form and the rational canonical form. Application to matrix powers, discrete system evolution, matrix exponentials and differential equations. Prerequisites: MATH 225 (or 121 or 227) and 228 (or 128 or 223). Notes: (1) This course cannot be taken for credit if credit has already been obtained in MATH 427. (2) This course will be offered starting in 2000/2001.

**MATH 329 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 228 (or 128 or 223) and 229 (or 128). MATH 225 recommended. Notes: (1) This course cannot be taken for credit if credit has already been obtained in MATH 427. (2) This course will be offered starting in 2000/2001.

**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. Prerequisite: MATH 120 or 125 or equivalent. Corequisite: MATH 215 or 317. Note: This course may not be taken for credit if credit has already been obtained in MATH 201 or 336.

**O MATH 336 Honors Differential Equations**

★3 (fi 6) (second term, 3-0-0). First order equations, second order equations. Systems of first order equations with constant coefficients, matrix differential equations, fundamental solutions, stability. Series solutions with a brief introduction to separation of variables, application to boundary value problems of mathematical physics. Elementary special functions. Elementary transform techniques. Prerequisite: MATH 118, MATH 217 or 214, MATH 225 (or 121 or 227). Note: This course may not be taken for credit if credit has already been obtained in either of MATH 201 or 334.

**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) (first 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 243.

**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 third and fourth year students with a good background in mathematics. Prerequisite: Any 200-level Mathematics course.

**O MATH 353 Annuities and Life Insurance**

★3 (fi 6) (second term, 3-0-0). Elements of probability and application to life contingencies. Force of mortality. Construction of the mortality table. Types of life annuities and life insurance. Commutation functions. Net Premiums. Prerequisite: MATH 215, MATH 253 and STAT 266.

**O MATH 354 Actuarial Mathematics**

★3 (fi 6) (first term, 3-0-0). Net premium reserves, multiple life functions, multiple decrement models, valuation theory for pension plans, insurance models, nonforfeiture benefits and dividends. Prerequisite: MATH 353. This course may be offered in alternate years.

**O 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.

**O 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.

**O 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 or and MATH 373.

**O MATH 380 Numerical Methods II**

★3 (fi 6) (second term, 3-0-1). Orthogonal polynomials and least squares approximations of functions. Iterative techniques for solving linear systems and calculation of eigenvalues and eigenvectors. Solution of non-linear systems, Newton's Methods and Steepest Descent Techniques, Numerical solution of initial value problems, Runge Kutta methods. Numerical solution of boundary value problems for ordinary differential equations and partial differential equations. Prerequisite: MATH 280. Corequisite: MATH 334.

**O 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 1 to 9 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.

**O MATH 409 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 a historical point of view. Prerequisite: MATH 314 or MATH 217.

**O MATH 411 Honors Complex Variable I**

★3 (fi 6) (first term, 3-0-0). Complex number system. Analytic functions. Single- and multi-valued functions, Cauchy's theorem and formula. Applications including the maximum modulus principle, Taylor's theorem and Laurent expansion. Harmonic functions. Dirichlet problem for the disk. Series of analytic functions. Calculus of residues. Idea of Analytic Continuation. 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.

**O 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.

**O MATH 417 Honors Real Variables I**

★3 (fi 6) (first term, 3-0-0). Elements of set theory, cardinality, brief construction of real numbers. Lebesgue measure and Lebesgue integral on the line. Differentiability, Riemann-Stieltjes integral and functions of bounded variation. Prerequisite: MATH 317 or equivalent.

**O 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.

**O 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 321 recommended.

**O 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.

**O MATH 425 Elementary Field Theory**

★3 (fi 6) (second term, 3-0-0). Fields, Field extensions, ruler and compass constructions, the Galois group, topics for Galois theory, and algebraic number theory. Prerequisites: MATH 128 (or 223) and a 300-level MATH course.

**O MATH 426 Honors Abstract Algebra I**

★3 (fi 6) (first term, 3-0-0). Groups, subgroups and normal subgroups, factor groups, homomorphisms, Sylow's theorems. Rings, ideals, quotient rings, homomorphisms, polynomial rings. Prerequisites: MATH 128 and a 300-level MATH course.

**O MATH 427 Honors Abstract Algebra II**

★3 (fi 6) (second term, 3-0-0). Modules over a principal ideal domain, finitely generated abelian groups, canonical forms of matrices, fields of characteristic 0, Galois theory. Prerequisites: MATH 227 and MATH 426.

**O 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 352 (or 427) or consent of Department.

#### **MATH 429 Combinatorics**

★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 329 or consent of Department.

#### **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). Introduction to partial differential equations as physical models. Linear and quasilinear first-order equations. Classification of second order linear equations and reduction to canonical form. Characteristic surfaces and curves and shock formation. Formulation of initial and boundary-value problems. Stability theory and well-posedness. Introduction to spectral theory for positive self-adjoint operators on bounded domains. Finite Fourier Transforms. Duhamel's Principle. Eigenfunction expansion for nonlinear stability theory. Prerequisite: MATH 337.

#### **MATH 438 Intermediate Partial Differential Equations II**

★3 (fi 6) (second term, 3-0-0). Introduction to transforms; Fourier, Hankel, Laplace; asymptotic approximation of Fourier Integrals; applications to discontinuous solutions of the wave equation, point sources, fundamental solutions, Green's Functions, with an introduction to generalized functions. Eigenfunction expansions and applications. Difference equations. Prerequisite: MATH 436.

#### **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, theorem 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 449 Elementary Differential Geometry II**

★3 (fi 6) (second term, 3-0-0). Manifolds, differentiable structures, differential systems. Frobenius theorem, linear connections, Riemannian manifolds, Lie groups, applications in mathematics or physics. Prerequisites: MATH 317, 446, or 448, or consent of the Department.

#### **MATH 472 Mathematical Modelling I**

★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.

#### **MATH 486 Numerical Analysis**

★3 (fi 6) (first term, 3-0-0). Selection of topics will be at the instructor's option in consultation with the students, and may be chosen from the following: nonlinear equations, direct and iterative methods for linear systems, eigenvalue problems, approximating functions, differentiation and integration, and numerical solutions of differential equations. Prerequisites: MATH 225 (or 227); MATH 317; an introductory course in Computing Science.

#### **MATH 496 Honors Seminar**

★3 (fi 6) (second 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. Prerequisite: MATH 317.

#### **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.

## Graduate Courses

#### **MATH 506 Complex Variables**

★3 (fi 6) (either term, 3-0-0). Conformal mapping, normal families, Riemann mapping theorem and symmetry principle. Harmonic functions: basic properties. Maximum modulus principle with Phragmen-Lindelof and Hadamard 3 circle theorem. Entire functions, infinite products and Hadamard factorization. Riemann surfaces. Prerequisite: MATH 411.

#### **MATH 512 Algebraic Number Theory**

★3 (fi 6) (second term, 3-0-0). Valuations and their extensions, ramifications; integral dependence, algebraic number fields, ideals and divisors, class number. Prerequisite: MATH 427.

#### **MATH 515 Introduction to Mathematical Finance**

★3 (fi 6) (either term, 3-0-0). Discrete time price processes. Pricing and hedging. The binomial model. Elements of continuous time stochastic calculus. Log-normal price processes. The Black-Scholes formula. Hedging in continuous time. Martingale representation. American Options. Optimal stopping results. Term structure of interest rates. Applications of filtering, etc. Prerequisite: MATH 417 or STAT 571 or consent of Department.

#### **MATH 516 Linear Analysis**

★3 (fi 6) (first 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) (second 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) (second term, 3-0-0). Banach algebras and spectral theory, compact and Fredholm operators, the spectral theory 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 521 Differential Manifolds**

★3 (fi 6) (first 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 522 Differential Geometry**

★3 (fi 6) (either term, 3-0-0). Riemannian geometry: metrics, connections, geodesics, curvature, de Rham theorem. General theory of connections: principal bundles, linear and affine connections, holonomy groups. Lie transformation groups. Selected topics from: Singularities of maps, global analysis, G-structures, symmetric spaces, applications to partial differential equations, physics. Prerequisite: MATH 521.

#### **MATH 524 Ordinary Differential Equations IIA**

★3 (fi 6) (first 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) (second term, 3-0-0). Asymptotics; boundary value problems; Poincare-Bendixon 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. Note: This course is intended primarily for students in Mathematics. It is more theoretically oriented than MATH 526. Prerequisite: MATH 436 or equivalent; Corequisite: MATH 518.

**MATH 529 Graph Theory**

★3 (fi 6) (either term, 3-0-0). Graphs, subgraphs, trees, connectivity, paths and cycles, matchings, chromatic number, independent sets and cliques, Ramsey Theory, planar graphs, directed graphs, algebraic graph theory. Prerequisites: MATH 421 and MATH 426.

**MATH 530 Algebraic Topology**

★3 (fi 6) (first 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. Corequisite: MATH 426.

**MATH 531 Algebraic Topology II**

★3 (fi 6) (second term, 3-0-0). Basics from homological algebra; (co)-homology; Lefschetz number, Euler characteristics, Lefschetz fixed point theorem (via singular theory and/or CW-theory and/or differential forms). Additional topics at the discretion of the instructor. Prerequisite: MATH 530 or consent of Department.

**MATH 532 General Topology I**

★3 (fi 6) (first term, 3-0-0). Elementary concepts of topology, nets and filters. Continuity homeomorphisms, product and quotient spaces. Axioms of separation and countability. Compactness, metrization, connectedness. Prerequisite: MATH 417 or 447.

**MATH 534 Introduction to the Theory of Approximation**

★3 (fi 6) (first term, 3-0-0). Polynomial interpolation, remainder formulae and error bounds. Best approximations in  $C$ ,  $L_p$  and other norms. Degree of approximation by polynomials and trigonometric polynomials. Spline interpolation and approximation. Numerical differentiation, quadrature formulae and other applications to numerical analysis. Prerequisite: MATH 418.

**MATH 536 Numerical Solutions of Partial Differential Equations I**

★3 (fi 6) (first 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 537 Numerical Solutions of Partial Differential Equations II**

★3 (fi 6) (second term, 3-0-0). Finite difference and finite element methods for parabolic and hyperbolic equations, initial-value and initial-boundary-value problems. Methods for linear/nonlinear scalar and systems of equations, singular equations. Convergence, stability analysis, and error estimate. Numerical dissipation and dispersion. Discontinuous solutions, shock and conservation laws. Prerequisites: MATH 337, 436 or equivalent, MATH 536 (recommended) 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.  $L_p$  spaces. Radon-Nikodym theorem. Hahn and Lebesgue decomposition theorems. Product measures. Fubini's theorem. Prerequisite: MATH 418.

**MATH 550 Applications of Differential Geometry to Mechanics**

★6 (fi 12) (two term, 3-0-0). Configuration spaces as smooth manifolds, co-tangent bundles as phase spaces, vector fields on manifolds and tangent bundles, differential forms, integration. Review of variational calculus, Lagrangians, Hamiltonians, Legendre maps, symplectic and contact structures, Liouville theorem. Additional topics from Riemann and Finsler geometry, connections, dynamical systems with symmetry groups, Arnold's theory of Lagrangian singularities, ergodicity, geometric quantization. Prerequisite: MATH 446 or 448 or MA PH 443.

**MATH 555 Fluid Dynamics**

★6 (fi 12) (two term, 3-0-0). Fundamentals including stress tensor, invariants, stream functions; basic equations, equations relative to a rotating system, energy equation; general theorems for flow of an inviscid fluid including general results for rotating fluids; irrotational flows of an inviscid fluid of constant density including

conformal mapping and the Joukowski airfoil; waves in an incompressible fluid including surface waves of small amplitude, nonlinear surface waves, internal waves in a continuously stratified fluid and inertial waves; dynamics of inviscid compressible fluids including shocks both normal and oblique, subsonic and supersonic flows; effects of viscosity including Darcy's law and Hele-Shaw cells; introduction to hydrodynamic stability and turbulence. Prerequisites: One of MATH 311, 407, 411, and MATH 436 or consent of Instructor.

**MATH 560 Optimization Techniques**

★3 (fi 6) (second term, 3-0-0). An advanced treatment of the theory and applications of modern techniques in optimization: dynamic programming, sequential techniques, duality, convexity, mathematical programming. Prerequisite: MATH 418 or MATH 414 or equivalent.

**MATH 581 Group Theory**

★3 (fi 6) (first term, 3-0-0). Sylow theory, free groups, soluble/nilpotent groups; Bilinera forms, classical groups; Character theory of finite groups. Prerequisite: Math 427.

**MATH 582 Rings and Modules**

★3 (fi 6) (second term, 3-0-0). Introduction to valuations; Free and projective modules, direct sums and products; Tensor products, central simple algebras; Aerin-Wedderburn theory; Commutative Noetherian rings including Nullstellensatz. Topics from homological algebra and category theory which may vary from year to year. Prerequisite: MATH 427 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 601 Morse Theory and Its Applications I**

★3 (fi 6) (either term, 3-0-0). Banach manifolds, tangent bundles, vector fields, semi-flows, implicit function theorem, submanifolds and transversity theorem. Riemannian manifold and Finsler structure. Deformation lemmas. Mountain Pass Theorem, Lusternik-Schnirelman theory. General Morse Lemma, critical groups and Morse inequalities, continuity of critical groups. Applications to Differential Equations and Boundary Value Problems. Prerequisites: MATH 518 and MATH 530 or consent of Department.

**MATH 614 Mathematical Models for Derivative Securities**

★3 (fi 6) (either term, 3-0-0). The Black-Scholes Models: self-financing, Feynmann-Kac. State prices and equivalent Martingale measures: arbitrage, state prices, Girsanov, pricing with dividends. American options: optimal stopping times, put options. Numerical Methods: binomial methods, finite-difference methods, simulation methods. Exotic and path-dependent options. Prerequisites: MATH 515, STAT 672.

**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) (first term, 3-0-0).

**MATH 618 Topics in Functional Analysis II**

★3 (fi 6) (second term, 3-0-0).

**MATH 627 Topics in Number Theory II**

★3 (fi 6) (second term, 3-0-0).

**MATH 630 Topics in Algebraic Topology**

★3 (fi 6) (either term, 3-0-0).

**MATH 638 Nonlinear Waves**

★3 (fi 6) (either term, 3-0-0).

**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 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) (first term, 3-0-0).

**MATH 664 Topics in Applied Mathematics II**

★3 (fi 6) (second term, 3-0-0).

**MATH 667 Topics in Differential Equations I**

★3 (fi 6) (first term, 3-0-0).

**MATH 668 Topics in Differential Equations II**

★3 (fi 6) (second term, 3-0-0).

**MATH 676 Topics in Geometry I**

★3 (fi 6) (first term, 3-0-0).

**MATH 677 Topics in Geometry II**

★3 (fi 6) (second term, 3-0-0).

**MATH 678 Ring Theory I**

★3 (fi 6) (first term, 3-0-0).

**MATH 681 Topics in Algebra**

★3 (fi 6) (first term, 3-0-0).

**MATH 682 Topics in Algebra**

★3 (fi 6) (second term, 3-0-0).

**MATH 692 Topics in Group Theory**

★3 (fi 6) (first term, 3-0-0).

**MATH 693 Topics in Group Theory**

★3 (fi 6) (second term, 3-0-0).

**MATH 900 Directed Research Project**

★6 (fi 12) (variable, unassigned).

**201.140 Mathématiques, MATHQ**

Faculté Saint-Jean

**Cours de 1er cycle****Q MATHQ 113 Calcul élémentaire I**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-1). Revue de la géométrie analytique, différentiation et intégration des fonctions simples, applications. Prérequis: Mathématiques 30 ou l'équivalent. Les étudiants ayant complété Mathématiques 31 ne peuvent pas prendre ce cours. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MATH 100, 114, 117. Anciennement MATHQ 202.

**Q MATHQ 114 Calcul élémentaire I**

★3 (fi 6) (premier semestre, 3-0-0). Revue de la géométrie analytique. Différentiation et intégration des fonctions simples. Applications. Prérequis: Mathématique 30 et 31 ou l'équivalent. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MATH 100, 113, 117. Anciennement MATHQ 203.

**Q 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. Prérequis: MATHQ 113, 114 ou l'équivalent. Anciennement MATHQ 204.

**Q 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. Prérequis: Mathématiques 30 ou l'équivalent. Remarque: ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MATH 127, 200, 243. Anciennement MATHQ 221.

**Q MATHQ 121 Algèbre linéaire II**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Bases d'espaces vectoriels, transformations linéaires, changement de bases. Valeurs propres et espaces propres, diagonalisation. Produit scalaire. Procédé d'orthogonalisation de Gram-Schmidt, diagonalisation orthogonale. Forme quadratique. Applications. Prérequis: MATHQ 120 ou l'équivalent. Les cours de mathématique 30 et MATHQ 113 sont

aussi recommandés. Remarque: ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MATH 227. Anciennement MATHQ 222.

**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'ils doivent 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. Ce cours est réservé aux étudiants du BEd Élémentaire. Prérequis: Math 30 ou l'approbation du Vice-doyen aux affaires académiques.

**Q MATHQ 201 Équations différentielles**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-1). Équations 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. Prérequis ou corequis: MATH 209 ou MATHQ 214. Notes: 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). Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en MATH 205, 334 ou 336.

**Q MATHQ 214 Calcul intermédiaire I**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Séries infinies. Courbes planes et coordonnées polaires. Vecteurs et géométrie analytique à trois dimensions. Dérivées partielles. Prérequis: MATHQ 115 ou l'équivalent. Remarque: ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MATH 209 ou 217. Anciennement MATHQ 302.

**Q MATHQ 215 Calcul intermédiaire II**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Équations différentielles linéaires de premier et de second ordre avec coefficients constants. Courbes, vecteurs, tangentes, longueur de l'arc, intégration en deux et trois dimensions, coordonnées polaires, cylindriques et sphériques, intégrale de ligne et de surface, théorème de Green. Divergence et théorème de Stokes. Prérequis: MATHQ 214. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour MATH 209, 308, ou 317. Anciennement MATHQ 303.

**201.141 Mechanical Engineering, MEC E**

Department of Mechanical Engineering  
Faculty of Engineering

The following courses were renumbered effective 1994/95:

Old	New	Old	New
MEC E 610	ENG M 620	MEC E 612	ENG M 640
MEC E 611	ENG M 630	MEC E 613	ENG M 650

The following courses were renumbered effective 1996/97:

Old	New	Old	New
MEC E 512	MEC E 412	MEC E 718	ENG M 670
MEC E 543	MEC E 443	MEC C 719	ENG M 680

The following course was renumbered effective 1997/98:

Old	New
MEC E 460	MEC E 465

**Undergraduate Courses****MEC E 200 Introduction to Mechanical Engineering**

Q1 (fi 2) (second term, 0-2s-0). Introduction to the profession of mechanical engineering with special emphasis of industries in Alberta. Selected guest speakers on design problems in mechanical engineering. Communication skills including written and oral presentations. (★1)

**MEC E 250 Engineering Mechanics II**

Q3.5 (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. (★3)

**MEC E 260 Mechanical Design I**

Q3.5 (fi 6) (second term, 2-0-3). Design morphology, analysis and design of components, computer-aided design introduction, design project. Prerequisites: CIV E 270, MEC E 265. (★3)

**MEC E 265 Engineering Graphics and CAD**

Q3.5 (fi 6) (first term, 2-0-3). Engineering drawing and sketching, conventional drafting, computer-aided drawing in 2D and 3D, solid modelling, and computer-aided design. Prerequisite: ENCOMP 100. (★3)

**MEC E 300 Mechanical Measurements**

Q3 (fi 6) (either term, 3-0-0). 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. (★3)

**MEC E 301 Mechanical Engineering Laboratory**

□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. (★3)

**MEC E 303 Mechanical Engineering Laboratory I**

□2.5 (*fi 6*) (either term, 1-0-3). Selected laboratory experiments in applied mechanics and thermosciences. Prerequisites: MEC E 300, 301. (★3)

**MEC E 310 Engineering Economy**

□3 (*fi 6*) (either term, 3-0-0). The application of the fundamentals of economics to engineering alternatives in planning, developing and managing industrial projects. (★3)

**MEC E 330 Fluid Mechanics**

□3.5 (*fi 6*) (either term, 3-0-1). Basic equations, hydrostatics, Bernoulli equation, momentum theories, similitude, fluid metering, fluid friction in pipes, external flow, boundary layers. Prerequisites: MEC E 250, MATH 209. Corequisite: CH E 243. (★3)

**MEC E 340 Applied Thermodynamics**

□3 (*fi 6*) (either term, 3-0-0). Review of the fundamentals of thermodynamics. Cycle analysis and application to gas compressors, gas and steam turbines, and refrigeration, availability analysis, principles of combustion, psychrometry. Prerequisite: CH E 243. (★3)

**MEC E 360 Mechanical Design II**

□3.8 (*fi 6*) (either term, 3-0-3/2). 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. (★3)

**MEC E 362 Mechanics of Machines**

□3.8 (*fi 6*) (either term, 3-0-3/2). Velocities and acceleration in plane mechanisms, balancing of rotating and reciprocating machinery, gears and gear trains. Prerequisite: MEC E 250. (★3)

**MEC E 364 Manufacturing Processes**

□2.8 (*fi 6*) (either term, 2-0-3/2). Primary and secondary processes in metal forming, material removal and fabrication techniques, selected field trips and laboratory and shop exercises. Prerequisite: MEC E 260. (★3)

**MEC E 380 Advanced Strength of Materials I**

□3 (*fi 6*) (either term, 3-0-0). Review of 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. (★3)

**MEC E 390 Numerical Methods for 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, interpolation, 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, 201, ENCM 100 (or equivalent). (★3)

**MEC E 402 Engineering Design**

□2 (*fi 4*) (first term, 2-0-0). Oral presentation and report writing techniques. Presentations by students and selected guest lecturers on design problems in engineering. (★2)

**MEC E 409 Experimental Design Project I**

□2.5 (*fi 6*) (either term, 1-0-3). 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 303 and MEC E 310. (★3)

**MEC E 412 Total Quality Management**

□3.5 (*fi 6*) (either term, 3-0-1). Quality and their applications in design and operations. Concept and philosophy of quality. Ideas of Deming, Juran, Feigenbaum, Ishikawa, and Taguchi. Quality systems including ISO 9000. Creation of quality including the new Japanese tools, QFD, FMEA, fault trees and value analysis. Statistical process control. Application of Total Quality Management philosophy. Prerequisites: MEC E 310 and STAT 235 or equivalent. (★3)

**MEC E 430 Compressible Flow**

□3 (*fi 6*) (first term, 3-0-0). One dimensional flow in pipes and varying area-nozzles, normal shock waves, flow in constant area pipes with friction and heat addition, methods of measurement in compressible flow, behavior of real, non-ideal gases and two phase flow, flow transients. Prerequisite: MEC E 330. (★3)

**MEC E 439 Principles of Turbomachines**

□3 (*fi 6*) (second 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 and non-air-breathing engines for aerospace propulsion, combustion and emissions. Prerequisites: MEC E 430, 470. (★3)

**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. (★3)

**MEC E 451 Vibrations and Sound**

□3.5 (*fi 6*) (first 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. (★3)

**MEC E 463 Thermo-Fluid Systems Design**

□4 (*fi 6*) (second term, 3-0-2). Design and optimization of thermo-fluid systems, heating and ventilation equipment and load calculations, system design, piping networks, heat exchanger analysis and design, computer-aided design projects. Prerequisite: MEC E 470. (★3)

**MEC E 465 Design Project**

□6 (*fi 12*) (two term, 1-0-4). 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 310, 360; corequisites: MEC E 362, 470, 480. (★6)

**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. (★2.5)

**MEC E 470 Heat Transfer**

□3.5 (*fi 6*) (first 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. Prerequisites: MATH 300, MEC E 330 and 340. Corequisite: MEC E 390. (★3)

**MEC E 480 Advanced Strength of Materials**

□3 (*fi 6*) (first 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. (★3)

**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 513 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. Prerequisites: MEC E 310 and STAT 235 or equivalent. (★3)

**MEC E 514 Reliability and Maintainability**

□3 (*fi 6*) (either term, 3-0-0). The study of reliability in engineering design, definitions of reliability, maintainability, hazard functions, failure rates, frequently used probability distributions, the economics of reliability and maintenance, single and multiple component systems. Prerequisite: STAT 235. (★3)

**MEC E 535 Inhalation Aerosols and their Applications in Medicine**

□3 (*fi 6*) (either term, 3-0-0). Overview of the mechanical principles involved in delivering aerosols to the lung for treatment of disease. Factors affecting deposition of aerosols in the lung, experimental measurement of aerosol properties, fluid dynamics in the lung, methods of producing aerosols for inhalation, theoretical models for predicting human lung deposition. Prerequisites: MEC E 330 or equivalent or consent of instructor. (★3)

**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. (★3)

**MEC E 539 Applied Computational Fluid Dynamics**

□3 (*fi 6*) (either term, 3-0-0). 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. (★3)

**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. (★3)

**MEC E 542 Multiphase Flow and Heat Transfer for Energy and Environmental Technologies**

□3 (fi 6) (either term, 3-0-0). Multiphase flow and transport phenomena, widespread occurrence and the design problems that arise, the central role of flow patterns and transition phenomena. Transport, heat transfer and separation processes of gas-liquid-solid systems are presented using recent research and development projects applied to enhanced oil production, energy recovery and environmental problems. Prerequisite: MEC E 330 or equivalent. (★3)

**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. (★3)

**MEC E 555 Introduction to Robotics**

□3 (fi 6) (either term, 3-0-0). History and description of industrial robot applications, kinematics of industrial manipulators, actuators and servo-mechanisms, gripper design, motion planning, programming and simulation, work cell design, social implications. Prerequisites: MEC E 250 and MATH 102 or equivalent. (★3)

**MEC E 563 Finite Element Method for Mechanical Engineering**

□3 (fi 6) (either term, 3-0-0). 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). (★3)

**MEC E 565 Environmental Factors in Mechanical Engineering**

□3 (fi 6) (either term, 3-0-0). System dynamics and limits to technological growth. Source inventories and regulatory standards for biological effects of pollutants, atmospheric dispersion models, stack design, analysis of source control of particulate and combustion product emissions, probability theory for risk analysis, and toxic release hazard assessments. Prerequisite: CH E 243. Corequisite: MEC E 330. (★3)

**MEC E 582 Principles of Smart Materials**

□3 (fi 6) (second term, 3-0-0). Introduction to coupled field theories. Constitutive response of materials with thermal and electromagnetic coupling. Microstructural changes due to phase transformations. Shape memory alloys, piezoelectric and magnetostrictive materials, smart polymers and solutions. Micromechanics of active composites. Prerequisites: MEC E 480 or consent of instructor. (★3)

**MEC E 601 Graduate Seminar**

□0.5 (fi 1) (either term, 0-1s-0). Presentations by Master's graduate students, staff, and visiting scientists on current research topics. (★0.5)

**MEC E 602 Graduate Seminar**

□0.5 (fi 1) (either term, 0-1s-0). Presentations by PhD graduate students on current research projects. (★0.5)

**MEC E 605 Experimental Strain Analysis**

□3 (fi 6) (either term, 3-0-0). Basic experimental methods used in engineering mechanics, including photoelasticity, strain gauges, brittle coatings; measurement in static, dynamic and transient system, ultrasonics; laboratory exercises. (★3)

**MEC E 612 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 both ENG M 640 and MEC E 612. Prerequisite: MP E 497, MGTSC 352 or equivalent. (★3).

**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. (★3)

**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. (★3)

**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. (★3)

**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. (★3)

**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. (★3)

**MEC E 640 Analytical Thermodynamics**

□3 (fi 6) (either term, 3-0-0). Extension of classical thermodynamics, statistical thermodynamics applied to engineering systems. Irreversible thermodynamics, thermoelectricity and thermodiffusion. (★3)

**MEC E 642 Surface Thermodynamics**

□3 (fi 6) (second term, 3-0-0). Introduction to surface thermodynamics, 2-D surface/interface phases and 1-D linear phases, equilibrium conditions of solid-liquid-fluid surface systems, wetting, capillary and adhesion phenomena, surface energetics, thin liquid films and elastic liquid-fluid interfaces, van der Waals and electrostatic forces in interfacial interactions, interfacial electrokinetic phenomena, modern techniques for surface/interfacial tension and contact angle measurements. Prerequisites: MEC E 640 or consent of Instructor. (★3)

**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. (★3)

**MEC E 652 Nonlinear Oscillations**

□3 (fi 6) (either term, 3-0-0). Phase plane, singular points, non-linear conservative systems, limit cycles, stability, perturbation method, non-linear resonance. (★3)

**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. (★3)

**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. (★3)

**MEC E 657 Dynamics of Rotating Machinery**

□3 (fi 6) (either term, 3-0-0). Modal behavior and fundamental response of rotors including gyroscopic and Coriolis effects. Finite elements modeling of rotor-bearing systems. Instrumentation for the measurement and analysis of vibration characteristics of rotors. Modal and influence coefficient methods of balancing. Transfer function techniques and coherence measurements. Fluid induced instabilities and self-excited instabilities. Prerequisites: MEC E 451 or equivalent, MEC E 563 or equivalent, or consent of Instructor. (★3)

**MEC E 663 Discrete Element Analysis of Mechanical Systems**

□3 (fi 6) (either term, 3-0-0). Applications of matrix methods, finite element and boundary element techniques to problems in applied mechanics. Emphasis on the use of micro-computers. (★3)

**MEC E 665 Pressure Vessel Design**

□3 (fi 6) (either term, 3-0-0). This course offers an integrated treatment of stress analysis, design theory, material behavior and construction of pressure vessels used in the energy, chemical and petroleum industries. Special topics covered include the basis of the ASME code, stresses in shells and heads, discontinuity stresses arising from openings and attachments, and design of welded joints. Prerequisite: MEC E 480 or consent of Instructor. (★3)

**MEC E 670 Advanced Heat Transfer**

□3 (fi 6) (second term, 3-0-0). Advanced topics in conduction and convection heat transfer; solution by analytical and numerical methods. (★3)

**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. (★3)

**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. (★3)

**MEC E 682 Plasticity**

□3 (fi 6) (either term, 3-0-0). Yield condition, plastic potential, elastic-plastic problems, characteristic theory, slip line fields, plane stress anisotropy. (★3)

**MEC E 683 Plates and Shells**

□3 (fi 6) (either term, 3-0-0). Solutions of the plate equation for rectangular and circular plates with various boundary conditions; special and approximate methods; membrane theory of shells; bending theory of cylindrical shells. (★3)

**MEC E 684 Static and Dynamic Stability**

□3 (fi 6) (either term, 3-0-0). Classical stability analysis of bars and plates subjected to various loading conditions. Energy methods. Dynamic stability of non-conservative force systems and the effects of internal friction. Inelastic buckling, torsional buckling. (★3)

**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. (★3)

#### MEC E 686 Fatigue of Engineering Materials

□3 (*fi 6*) (either term, 3-0-0). A study of mechanisms and mechanics of fatigue process: damage caused by constant and variable cyclic amplitudes and random loading; effects of load interaction; initiation and propagation of fatigue cracks; life prediction; effects of multiaxial stress states, temperature and environment. (★3)

#### 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. (★3)

#### MEC E 728 Advanced Topics in Applied Thermodynamics I

□3 (*fi 6*) (either term, 3-0-0). (★3)

#### MEC E 729 Advanced Topics in Applied Thermodynamics II

□3 (*fi 6*) (either term, 3-0-0). Combustion, refrigeration. (★3)

#### MEC E 738 Advanced Topics in Fluid Dynamics I

□3 (*fi 6*) (either term, 3-0-0). (★3)

#### 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. (★3)

#### MEC E 748 Advanced Topics in Thermodynamics I

□3 (*fi 6*) (either term, 3-0-0). (★3)

#### MEC E 749 Advanced Topics in Thermodynamics II

□3 (*fi 6*) (either term, 3-0-0). Energy conversion, general thermodynamics, irreversible thermodynamics. (★3)

#### MEC E 758 Advanced Topics in Dynamics I

□3 (*fi 6*) (either term, 3-0-0). (★3)

#### MEC E 759 Advanced Topics in Dynamics II

□3 (*fi 6*) (either term, 3-0-0). Wave propagation, orbital dynamics. (★3)

#### MEC E 778 Advanced Topics in Heat Transfer I

□3 (*fi 6*) (either term, 3-0-0). (★3)

#### MEC E 779 Advanced Topics in Heat Transfer II

□3 (*fi 6*) (either term, 3-0-0). Conduction, convection, radiation. (★3)

#### MEC E 788 Advanced Topics in Solid Mechanics I

□3 (*fi 6*) (either term, 3-0-0). (★3)

#### MEC E 789 Advanced Topics in Solid Mechanics II

□3 (*fi 6*) (either term, 3-0-0). Elasticity plasticity, viscoelasticity, shells. (★3)

#### MEC E 900 Directed Research Project

★6 (*fi 12*) (variable, unassigned). Detailed Engineering report in the student's major area of interest.

## 201.142 Medical Genetics, MDGEN

Department of Medical Genetics  
Faculty of Medicine and Dentistry

### Graduate Courses

#### MDGEN 601 Selected Topics in Medical Genetics

★2 (*fi 4*) (either term, 24 hours). A directed reading and seminar course based on papers taken from the recent literature of medical genetics. The course will consist of lectures on a specific topic in medical genetics and oral presentations of the current literature by students. Selected topics will 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 603 Seminars in Medical Genetics

★1 (*fi 2*) (either term, 0-1s-0). A seminar course on topics of current research interest in medical genetics. Seminars will focus alternately on clinical and basic research, and will comprise seminars in Medical Genetics Rounds and other special seminars by external speakers. Students will submit a written report based on a topic presented by one of the speakers. Prerequisite: consent of the Department.

## 201.143 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 42-week period. They are open to students of Medical Laboratory Science only or by special permission of the Division.

### Undergraduate Courses

#### 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 leukaemia. 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 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*) (second term, 1-0-0). 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 203 and 205.

#### **MLSCI 465 Applied Toxicology**

★3 (*fi 6*) (first term, 3-0-3). 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 203 and 205 or 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. This course is similar to MLSCI 465 except no laboratory sessions will be offered. Prerequisites: BIOCH 203 and 205 or consent of Division.

#### **MLSCI 475 Clinical Immunology**

★3 (*fi 6*) (first 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: IMMUN 370 or MICRB 370 or 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 203 and 205 or equivalent.

#### **MLSCI 481 Techniques in Molecular Biology**

★3.5 (*fi 6*) (first 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 and graduate students.

## 201.144 Medical Microbiology and Immunology, MMI

Department of Medical Microbiology and Immunology  
Faculty of Medicine and Dentistry

**Note:** See also INT D 224, 371, 372, 409, 452 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.

### Undergraduate Courses

#### **MMI 133 Medical Microbiology for Nurses**

★3 (*fi 6*) (either term, 48 hours). Introductory course in microbiology designed specifically for students of nursing (Collaborative Nursing Program) but open also to those interested in an introduction to medical microbiology. The course deals with basic information on microorganisms and infections and then concentrates on some of the more important pathogenic microorganisms and the diseases they cause. Ways to counteract infections by antibiotics, disinfection and sterilization, and hospital infection control are also covered. (36 hours of lectures; 1-hour mid-term exam; 2-hour final exam; 10 hours of video and discussions.)

#### **MMI 240 Pathogenic Microbiology**

★6 (*fi 12*) (two term, 3-0-4). The course considers the role of bacteria, viruses, fungi, and parasites in human disease. Lectures emphasize mechanisms of microbial pathogenicity and immune response to infection. Laboratory emphasizes diagnostic procedures. Prerequisite: BIOL 107. Priority given to Medical Laboratory Science students.

#### **MMI 241 Pathogenic Microbiology**

★6 (*fi 12*) (two term, 3-0-0). The course considers the role of bacteria, viruses, fungi, and parasites in human disease. Lectures emphasize mechanisms of microbial pathogenicity and immune response to infection. Prerequisite: RT (CSMLS) certification or consent of Department.

#### **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. Prerequisite: MICRB 265. May not be taken for credit if credit already obtained in MMID 240 or 241 or 350, or in MMI 240 or 241 or 350.

#### **MMI 352 Practical Pathogenic Bacteriology**

★3 (*fi 6*) (second term, 0-0-4). This laboratory course will emphasize development of skills and knowledge for the safe handling of infectious bacteria, how medically important organisms are identified and will examine some of the molecular

mechanisms of bacterial virulence. Prerequisite or corequisite: MMI 351 or consent of the Department. May not be taken for credit if credit already obtained in MMID 240 or 241 or 350, or in MMI 240 or 241 or 350.

#### **MMI 403 Independent Research in Immunology**

★3 (*fi 6*) (either term, 0-0-3). Research project in an immunology laboratory on a specific topic. Can be taken for credit more than once. Students will make arrangements with a faculty member within the Department to supervise the research project. A final oral presentation on the research project is required for completion of the course. Prerequisites or corequisites: INT D 370 or INT D 371 or INT D 452 and consent of Department.

#### **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, laboratories, and student seminars. Prerequisites: BIOCH 203 and 205, and MMI 240 or 241 or 350.

#### **MMI 412 Special Project in Medical Microbiology**

★3 (*fi 6*) (either term, 0-0-6). Directed individual study. Can be taken for credit more than once. Prerequisite: Consent of Department

#### **MMI 415 Mechanisms of Pathogenicity II**

★3 (*fi 6*) (second term, 3-0-0). Mechanisms of pathogenesis by chlamydiae, mycoplasmas, viruses, fungi, and protozoa. Through intensive study of selective systems, down to the molecular level where current knowledge permits, the general principles governing the interactions between human host and pathogen will be examined. Prerequisites: BIOCH 203 and 205, MMI 240 or 241 or 350, and INT D 370 or INT D 371.

#### **MMI 422 Bacteriology**

★2 (*fi 4*) (first term, 28 hours). An introduction to general bacteriology, aspects of infection and resistance, selected examples of infectious diseases. Special bacteriology of the mouth, including dental caries and periodontal diseases. Course for dental hygiene and dentistry students.

#### **MMI 425 Medical Virology**

★3 (*fi 6*) (second term, 1-0-5). An introduction to the basic techniques of cell culture and virus propagation and a detailed examination of the principles underlying the identification of viruses of medical importance. Strong emphasis will be placed upon the rationale of viral diagnostic methods. Prerequisites: INT D 224 and consent of Department.

#### **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: MMI 240 or 241, consent of Department.

#### **MMI 427 Fungi in the Human Environment**

★3 (*fi 6*) (first term, 3-0-3). Human health implications of allergenic, toxigenic, and pathogenic fungi will be considered. Topics include pathogenicity, epidemiology, ecology and distribution, occupational and environmental risks of exposure to fungi or their metabolites, immune responses, diversity of fungi involved in human disease, aspects of clinical disease, and therapy. Laboratories will emphasize techniques for detection, isolation, manipulation, and identification of medically important fungi. Prerequisites: Introductory course in medical microbiology (MMI 240 or MMI 350) or mycology (BOT 306) or microbiology (MICRB 265 or 391) or consent of Department.

#### **MMI 440 Medical Microbiology**

★3 (*fi 6*) (second term, 3-0-0). An advanced level lecture course covering the latest topics in medical microbiology. Topics include models for infectious processes in different organ systems, novel methods for antimicrobial susceptibility testing, the application of molecular techniques in the diagnostic laboratory for HIV, hepatitis B and C, infections in the compromised patient, and strategies for control of infections. The emphasis will be on laboratory applications to infectious processes. Prerequisite: MMI 240 or MMI 241 or MMI 350.

## Graduate Courses

**Note:** The following undergraduate courses may be taken for credit by graduate students: MMI 405, 415, 425, 426, 427.

#### **MMI 501 Current Concepts in Immunology**

★3 (*fi 6*) (either term, 0-3s-0). Lecture and seminar course on three to four areas of immunology of current interest based on original literature. The course will emphasize interpretation of published evidence based on theoretical models in the literature and will involve student participation. Offered in alternate years. Prerequisite: INT D 452 or consent of Department.

#### **MMI 502 Selected Topics in Immunology**

★3 (*fi 6*) (either term, 2-1s-0). Lecture and seminar course covering a particular area of immunology in depth. Offered in alternate years. Prerequisite: INT D 452 or consent of Department.

#### **MMI 512 Special Projects**

★3 (*fi 6*) (either term, 0-0-3).

#### **MMI 516 Advanced Techniques in DNA Cloning**

★3 (*fi 6*) (Spring/Summer, 1-0-6). A combined lecture and laboratory course which provides instruction in the basic and advanced techniques used to construct and analyze recombinant DNA molecules. Isolation of DNA and RNA, construction of recombinant DNA molecules in plasmid and phage vectors, isolation and purification of genes by nucleic acid hybridization, amplification of DNA molecules by the polymerase chain reaction, analysis of DNA molecules by restriction endonuclease digestion and DNA sequencing. Strategies for cloning novel genes. Prerequisites: BIOCH 203 and 205, GENET 270 (GENET 390 also recommended) and consent of Department is also required. Designed for advanced undergraduate and graduate students. Offered in alternate years.

#### **MMI 520 Bacterial Plasmids**

★3 (*fi 6*) (first term, 3-0-0). The biology of plasmids and plasmids as tools for molecular biology. The structure and properties of various bacterial plasmids (antibiotic resistance plasmids, colicin and enterotoxin-producing plasmids) will be considered in light of our current understanding of the evolution of plasmids. The involvement of insertion sequences and transposons in plasmids organization will be discussed. The course will focus on the modes of plasmids DNA replication and the means by which bacterial plasmids are maintained in host cells. Important plasmid-coded functions such as incompatibility and conjugative transfer will be discussed in detail. The effect of plasmids in human and veterinary medicine and on plant pathogenesis (the crown gall disease) will also be considered. The use of plasmids in genetic engineering including the choice of vectors, cloning methods and risks and benefits will complete the course. Note: Designed for advanced honors and graduate students and offered in alternate years. Prerequisites: BIOCH 203 and 205, GENET 270, or consent of Department.

#### **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 of all second- and third-year graduate students in medical microbiology and immunology. Open to graduate students in Medical Microbiology and Immunology only.

## 201.145 Medicine, MED

Department of Medicine  
Faculty of Medicine and Dentistry

### Undergraduate Courses

#### 201.145.1 Department of Oral Health Sciences Courses

##### **MED 434 General Medicine**

★1 (*fi 2*) (second term, 15 hours). General aspects of medicine with particular reference to local and systematic diseases of dental interest.

#### 201.145.2 Faculty of Medicine and Dentistry Courses

**Note:** Joint Medicine/Dentistry Courses are listed in §201.56 (DMED).

##### **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 431 Procedural Skills**

★1 (*fi 2*) (first term, 16 hours). For third-year medical students only.

**MED 432 Musculoskeletal Systems**

★3 (*fi 6*) (first term, 73 hours). This interdivisional course will cover the following topics: orthopaedics, rehabilitation medicine and rheumatology. For third-year medical students only.

**MED 433 Topics in Dermatology**

★1 (*fi 2*) (first term, 16 hours). For third-year medical students only.

**MED 436 Nephrology: Pathophysiology of Clinical Renal Disease and Related Disorders**

★3 (*fi 6*) (first term, 29 hours). In-depth review of renal physiology and pathophysiology. Will cover normal mechanisms of acid base and fluid balance, renal function testing; pathophysiology associated with urinary tract infection; inflammatory and degenerative disorders, renal failure. Prerequisites: NURS 313 and consent of Division of Nephrology. Preference to students with interest and experience in nephrology nursing.

**MED 440 Comprehensive Examination**

★5 (*fi 10*) (second term, 9 hours). Final comprehensive exam for students registered in the MD program.

**MED 441 Clinical Problems**

★0 (*fi 2*) (two term, 36 hours). A lecture series available to students in Phase III, MD program only.

**MED 442 Review of Internship Medicine**

★0 (*fi 4*) (second term, 56 hours). A review of topics in Internal Medicine. For fourth-year medical students only.

**MED 445 Internship in Geriatrics**

★1.5 (*fi 3*) (either term, 2 weeks). This rotation consists of clinical experience in the assessment and management of ambulatory patients through clinics and home visits as well as comprehensive assessment of frail-complex inpatients. The clinical experience is supported by didactic teaching of geriatric syndromes. Student Internship for students in Phase III MD program only.

**MED 446 Student Internship**

★7.5 (*fi 15*) (two term, 10 weeks). Student internship for students in Phase III, MD program only.

**MED 447 Elective**

★0 (*fi 18*) (two term, 12 weeks). A program of elective courses described in detail in the Faculty Electives catalogue. This program forms a mandatory part of Phase III. For third- and fourth-year medical students only. Consent of Instructor is required.

**MED 516 Practice of Medicine, Part 1**

★6 (*fi 12*) (two term, 0-8s-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 the INT D 410 course. 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 520 Pre-Clinical Exam**

★5 (*fi 10*) (second term, 9 hours). Final preclinical exam for students 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 523 Musculoskeletal System**

★6 (*fi 12*) (either term, 7 weeks). Anatomy, physiology, pathophysiology and management in the musculoskeletal system. Open only to students registered in the MD Program

**MED 526 Practice of Medicine, Part II**

★6 (*fi 12*) (two term, 0-8s-0). A continuation of MED 516 which involves further discussion of medical skills which may be generalised 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.

**Graduate Courses****201.145.3 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 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 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 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.

**201.145.4 Faculty of Medicine and Dentistry Courses****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.

**Courses Beginning in 2000-2001****MED 531 Clinical Problems Series**

★1 (*fi 2*) (two term, 36 hours). A series for students registered in the MD program.

**MED 532 Link Block**

★4 (*fi 8*) (first term, 4 weeks). This block serves as a link between the pre-clinical and clinical years. It will include procedural skills, emergency medicine, 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 545 Geriatrics Student Internship**

★2 (*fi 4*) (either term, 2 weeks). Student internship in Geriatrics for students registered in the MD Program.

**MED 546 Medicine Student Internship**

★10 (*fi 20*) (either term, 10 weeks). Student internship in Medicine for students registered in the MD Program.

**MED 547 Clinical Electives**

★14 (*fi 28*) (either term, 14 weeks). Student internship in electives for students registered in the MD program.

**MED 548 Clinical Selectives**

★4 (*fi 8*) (either term, 4 weeks). Student internship in selectives that involve medical and surgical clinical experiences. For students registered in the MD program.

**Courses Beginning in 2001-2002****MED 540 Comprehensive Exam**

★5 (*fi 10*) (second term, 9 hours). Final comprehensive exam 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, 56 hours). Lecture and seminar series registered in the final year of the MD Program.

## 201.146 Microbiology (Biological Sciences), MICRB

Department of Biological Sciences  
Faculty of Science

**Notes**

- (1) See the following sections for listings of other Biological Sciences courses: Biology (BIOL); Botany (BOT); Entomology (ENT); Genetics (GENET); Zoology (ZOOL)
- (2) See also Laboratory Animal Management (LB AN) Listing.
- (3) See also INT D 224, 371, and 452, for other courses in Virology and Immunology (taught by the Department of Biological Sciences and MMI).

### Undergraduate Courses

**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 108; Prerequisites or corequisites: BIOCH 220 or 203. NOTE: Students planning on taking senior MICRB courses must take BIOCH 203/205.

**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, BIOCH 203 and 205.

**MICRB 313 Microbial Physiology Laboratory**

★3 (*fi 6*) (first term, 0-0-6). Laboratory exercises introduce the microanalytical techniques used for measuring microbial growth and for following metabolic events at the cellular and subcellular level. Prerequisite or corequisite: MICRB 311.

**MICRB 316 Molecular Microbiology**

★3 (*fi 6*) (second term, 3-0-0). The response of microbes to changes in their environment at the molecular level. Topics will include sporulation, signal transduction, chemotaxis, heat shock response, oxygen stress, osmolarity, pilus expression, and mechanisms of genetic transfer. Prerequisites: INT D 224, MICRB 265 and BIOCH 203/205.

**MICRB 343 Topics In Microbial Laboratory Techniques**

★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. Emphasis will be placed on examples from the recent literature. Prerequisite MICRB 313.

**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, including enzymes, plasmids and RNA molecules. Prerequisite MICRB 313. Corequisite MICRB 343. Credit may not be obtained for both MICRB 344 and 345.

**MICRB 391 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 and BIOCH 203/205.

**MICRB 392 Laboratory Methods for Environmental Microbiology**

★3 (*fi 6*) (first 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. Restricted to Honors or Specialization students in Biological Sciences or consent of Department. Prerequisite or corequisite: MICRB 391.

**MICRB 401 Molecular Immunology**

★3 (*fi 6*) (second term, 3-0-0). Molecular aspects of immunology. Qualitative and

quantitative reactions, properties, and structures of antibodies and antigens. Prerequisite: INT D 371.

**MICRB 406 Topics in Cell Biotechnology**

★3 (*fi 6*) (two term, 0-2s-0). This course is designed to develop familiarity with current research literature in Cell Biotechnology. Note: Restricted to Honors Cell Biotechnology students. Prerequisites: A 300-level Microbiology course and consent of the Cell Biotechnology Committee.

**MICRB 410 Structure of Microorganisms**

★3 (*fi 6*) (second term, 3-0-0). Cellular structure of bacteria and lower eukaryotes with particular emphasis on the use of antibiotics as tools for investigating cell structure. Prerequisite: MICRB 311.

**MICRB 415 Industrial Microbiology**

★3 (*fi 6*) (second 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 420 New Directions in Antibiotic Research**

★3 (*fi 6*) (first term, 3-0-0). Selected topics in antibiotic research will be discussed, with emphasis on molecular genetic studies from the recent literature. Prerequisites: GENET 270 and MICRB 311.

**MICRB 450 Fermentation Biotechnology**

★6 (*fi 12*) (two term, 1-0-6). This course will describe the use of microbes and recombinant DNA constructs in fermentation technology. Course material will also include theoretical aspects of kinetics, design, scale-up and downstream processing. The selection, modification and optimization of the proper organism, medium and fermentation facility and economic considerations will be discussed. Prerequisites: MICRB 311, 313.

**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 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, 540, 541, 550, 555, 560; CHEM 361, 363, 461; CELL 300, 301; INT D 371, 372, 421, 452, 455, 464, 543, 544, 545, 551; MA SC 400, 401, 402, 410, 412, 420, 425, 430, 437, 440, 445, 450, 454, 470, 480; MMI 350, 405, 415, 516, 520; NEURO 472, 503, NU FS 363; PALEO 318, 319; 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 will be required. Prerequisite: consent of the Department.

**MICRB 514 Advanced Topics in Microbiology**

★3 (*fi 6*) (second term, 3-0-0). This course will consist of mini-series of lectures by rotating department faculty members dealing with their special research and general interest areas. Topics covered will vary from year to year. Prerequisite: consent of Department.

**MICRB 516 Advanced Topics in Molecular Microbiology**

★3 (*fi 6*) (second term, 3-1s-0). Lecture and seminar course on molecular mechanisms found in prokaryotes based on the current literature. Grades will be assigned on the basis of participation at weekly seminars as well as written analyses of assigned readings. Prerequisite: consent of the Department.

**MICRB 591 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 391, but preparation of a major term paper and an oral presentation will be required. Prerequisite: MICRB 265 and/or consent of Department.

**MICRB 606 Microbiology Seminar**

★6 (*fi 12*) (two term, 0-3s-0). Credit may be obtained more than once.

**MICRB 607 Microbiology Seminar**

★6 (*fi 12*) (two term, 0-3s-0). Intended for second-year graduate students.

## 201.147 Mineral Engineering, MNL E

School of Mining and Petroleum Engineering  
Department of Civil and Environmental Engineering  
Faculty of Engineering

**Note:** See also Materials Engineering (MAT E); Mining Engineering (MIN E); Mining and Petroleum Engineering (MPE); and Petroleum Engineering (PET E) listings.

### Graduate Courses

#### MNL E 630 Advanced Topics in Coal Preparation

□3 (*fi 6*) (either term, 3-0-0). Advanced topics in coal preparation, including the modelling of unit operations used in coal preparation, circuit analysis and optimization and process control. Coal preparation economies. Prerequisite: MATE 331. (★3)

#### MNL E 635 Coal Conversion and Utilization

□3 (*fi 6*) (either term, 3-0-0). Coal processing, with emphasis on carbonization, gasification, liquefaction, and selected aspects of combustion and pollution abatement techniques. Prerequisite: MET E 535. (★3)

#### MNL E 640 Advanced Topics in Mineral Process Engineering

□3 (*fi 6*) (either term, 3-0-0). An advanced treatment of selected topics of current interest in mineral process engineering. (★3)

#### MNL E 682 Graduate Seminar

□0.5 (*fi 2*) (variable, 0-1s-0). Discussion of progress and problems in research under way in the mining and mineral process area of the Department. (★1)

## 201.148 Mining and Petroleum Engineering, MP E

Department of Civil and Environmental Engineering  
Faculty of Engineering

**Note:** See also Mining Engineering (MIN E), Materials Engineering (MAT E), and Petroleum Engineering (PET E) listings.

The following courses were renumbered effective 1997/98:

Old	New	Old	New
MMP E 392	MP E 292	MMP E 508	MP E 408
MMP E 422	MP E 322	MMP E 597	MP E 497
MET E 431	MP E 331	MMP E 599	MP E 499
MMP E 490	MP E 390		

### Undergraduate Courses

#### MP E 322 Rock Structures and Intact Rock Properties

□3.5 (*fi 6*) (second term, 3-1s-0). Rock texture and fabric; compaction, fracture and deformation properties, effect of environment and time, strength theories. State of stress in the Earth's crust and its measurement. Formation, geometry and classification of depositional, diastrophic and non-diastrophic structures including bedding, jointing, faulting, folding, cleavage. Representation of structures on maps and stereographic projections. Prerequisite: CIV E 270 or consent of Instructor. (★3)

#### MP E 499 Undergraduate Seminar

□1 (*fi 2*) (first term, 1-0-0). Special lectures and discussion on topics in engineering. (★1)

### Graduate Courses

#### MP 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. Prerequisites: consent of Instructor. (★3)

#### MP E 900 Directed Research

★6 (*fi 12*) (variable, unassigned). An engineering project for students registered in a Master of Engineering program.

## 201.149 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). Essential mining concepts and terminology; mining in Alberta; company operations; stages of mining; unit mining operations; surface mine development and methods; underground mine development and methods; mining methods selection and comparison; feasibility studies and mine costs. Laboratories will cover case studies, basic mine design problems, mine visits and mining films/videos. Students will also undertake small group projects on the operations of selected Canadian mining companies. Prerequisite: consent of Instructor. (★3)

#### MIN E 310 Ore Reserve Estimation

□4.5 (*fi 6*) (second 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 for modelling rock types. Estimation and simulation methods for characterizing ore grade variability. Students will learn the principles and procedures for constructing orebody models in a variety of geologic settings. Specialized topics such as ore reserve classification, uncertainty assessment, mine selectivity, and grade control will also be covered. A variety of public-domain and commercial software will be used for a series of laboratories. Pre- or corequisites: MATH 209 and STAT 235 and EAS 210. (★3)

#### 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. (★3)

#### 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. (★3)

#### MIN E 325 Mine Planning and Design

□4.5 (*fi 6*) (first term, 3-0-3). Planning of surface mines; pit designs, pit limits and optimization; haul road design; waste dump design; and mine plan requirements. Planning of underground mines; mine access and development methods; mine layout and mine plan requirements. Laboratories will include introduction to commercially available Mine Planning software. Prerequisites: MIN E 295, CIV E 265, MIN E 310 or consent of Instructor. (★3)

#### 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. (★3)

#### 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. (★3)

#### 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. (★3)

**MIN E 407 Principles of Mine Ventilation**

□3.8 (fi 6) (second term, 3-0-3/2). Principles and practices for control of the underground environment including application of software and governing legislation. Prerequisite: CH E 312, MIN E 414, or equivalent. (★3)

**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: MEC E 310, STAT 235 or consent of Instructor. (★3)

**MIN E 413 Surface Mining Methods**

□3.8 (fi 6) (first term, 3-0-3/2). Surface mining methods, equipment types specification and operation; production and productivity; control of operations; mine drainage; land conservation and reclamation. Prerequisites: MIN E 310, MIN E 330, MIN E 323, and MIN E 325 or consent of Instructor. (★3)

**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. (★3)

**MIN E 420 Mine Equipment Selection and Maintenance**

□3 (fi 6) (second term, 3-0-0). Equipment selection principles; equipment sizing and matching; mining/mechanical/electrical aspects; capital and operating costs; decision/risk analysis; purchasing principles; maintenance principles and practices; maintenance characteristics of major equipment, maintenance support facilities. Prerequisite: MIN E 413 or 414 or consent of Instructor. (★3)

**MIN E 428 Mining Field Trip**

□0.5 (fi 1) (either term, 0-1s-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. (★0.5)

**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 (★3)

**Graduate Courses****MIN E 602 Design Project I**

□3 (fi 6) (first term, 3-0-0). Design of a mining operation. (★3)

**MIN E 603 Design Project II**

□3 (fi 6) (second term, 3-0-0). Continuation and extension of MIN E 602. (★3)

**MIN E 611 Mining Property Evaluation**

□3 (fi 6) (either term, 3-0-0). Basic valuation concepts, ore reserve estimation, factors influencing mining economics, time value of money, cost estimation, taxation, project evaluation criteria, risk analysis, feasibility analysis, case studies. PET E 685 is recommended as either an alternative or complementary course. (★3)

**MIN E 612 Geostatistical Methods for Modelling Earth Sciences Data**

□3 (fi 6) (either term, 3-0-0). Geostatistical methods are presented for characterizing the spatial distribution of regionalized variables, such as ore grades, porosity, permeability, and contaminant concentrations. This class focuses on the geostatistical methodologies for quantifying spatial variability with variograms/covariance functions, estimation with kriging techniques, and stochastic simulation with Gaussian, indicator, and annealing-based methods. Important subjects such as uncertainty quantification, volume-variance relations, and modelling multiple variables will also be addressed. Case studies will be presented from mining, petroleum, and environmental engineering. Students will undertake a variety of theoretical and practical assignments using the GSLIB software (where appropriate). Prerequisite: consent of Instructor. (★3)

**MIN E 613 Application of Geostatistical Methods to Spatial Mapping and Decision Making**

□3 (fi 6) (either term, 3-0-0). Geostatistical methods are used for orebody modelling, petroleum reservoir modelling, or environmental site characterization. This class focuses on the computational and hands-on aspects of using geostatistical methodologies for practical problem solving. Lectures present practical approaches to problems of (1) variogram inference in presence of sparse data, (2) optimal estimation, (3) stochastic simulation for local and global uncertainty, (4) volume-variance relationships, and (5) loss functions for optimal

decision making in the presence of uncertainty. Students undertake a class project individually or in small groups. Prerequisite: consent of Instructor. (★3)

**MIN E 620 Rock Mechanics**

□3 (fi 6) (either term, 3-0-0). An advanced treatment of selected topics in rock mechanics. (★3)

**MIN E 621 Geomechanics in Underground Mining**

□3 (fi 6) (either term, 3-0-0). Energy changes due to mining; multi-seam mining; interactions; pillar design in hard rock, coal and potash; strata mechanics in longwall and shortwall coal mining; rock mechanics of potash mining and caving methods; rock bursts and bumps; subsidence; underground rock mechanics instrumentation and applications of numerical methods of stress analysis. Prerequisite: MIN E 323 or equivalent. (★3)

**MIN E 622 Surface Mining Systems and Equipment**

□3 (fi 6) (either term, 3-0-0). An advanced treatment of selected topics in surface mine methods, selection of mining equipment, equipment maintenance techniques, and equipment performance and productivity. Case studies. Prerequisite: MIN E 413 or consent of Instructor. (★3)

**MIN E 623 Rock Slope Stability in Surface Mining**

□3 (fi 6) (either term, 3-0-0). 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. (★3)

**MIN E 630 Advanced Mine Transport**

□3 (fi 6) (either term, 3-0-0). 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. (★3)

**MIN E 631 Advanced Pit Design and Optimization**

□3 (fi 6) (either term, 3-0-0). Mechanics of open pit design, theory of Lerchs-Grossman's, floating cone, conditional simulation, neural network and heuristic algorithms for open pit optimization. Large scale applications of these algorithms for designing and optimizing open pit limits and subsequent incremental bench programs. Students undertake design projects under Instructor's direction. Prerequisites: MIN E 413 and MP E 497 or consent of Instructor. (★3)

**MIN E 632 Mine Production Engineering**

□3 (fi 6) (either term, 3-0-0). Theory and application of operations research techniques in strategic and tactical mine production models and mine plans, production and development schedules, blending and stockpiling, cut-off grade dynamics, fleet production management and inventory control and management. Case studies from existing mining operations will be introduced by guest lecturers. Prerequisites: MP E 497 or consent of Instructor. (★3)

**MIN E 640 Simulation of Industrial Systems**

□3 (fi 6) (either term, 3-0-0). 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. (★3)

**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. (★3)

**MIN E 682 Graduate Seminar**

□0.5 (fi 2) (variable, 0-1s-0). Discussion of progress and problems in mining research. (★1)

**MIN E 710 Mining**

□3 (fi 6) (either term, 3-0-0). Readings and discussion of selected topics in mining engineering. (★3)

**201.150 Music, MUSIC**

Department of Music  
Faculty of Arts

**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.

**MUSIC 101 Introduction to 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. Note: Not open to BMus (all routes) students.

**MUSIC 122 Second Practical Subject**

★3 (*fi 6*) (two term, 1-0-0). Note: Admission restricted to BMus (all routes) students, and BEd students majoring in secondary music education. Prerequisite: consent of Department.

**MUSIC 124 Applied Music**

★3 (*fi 6*) (two term, 1-0-0). For non-BMus students. Prerequisite: consent of Department, based on audition.

**MUSIC 125 Applied Music**

★6 (*fi 12*) (two term, 2-0-0). Restricted to BMus students.

**MUSIC 128 Voice Class**

★3 (*fi 6*) (two term, 0-2L-0). Fundamental vocal skills. Restricted to second study BMus (all routes) and BEd Music Major/Minor students. Prerequisite: consent of Department.

**MUSIC 129 Fundamental Keyboard Skills**

★3 (*fi 6*) (two term, 0-2L-0). Prerequisite: consent of Department. Restricted to BMus (all routes) and BA Honors Music Major students.

** 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). Concert Band, Wind Ensemble, Academy Strings, Orchestral Winds, or Jazz Band I or 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 Dept. of Music Theory Placement and Aural Skills Examinations for other than BMus students. Corequisite: MUSIC 155 or 156.

**MUSIC 155 Music Theory I**

★3 (*fi 6*) (either term, 3-0-0). A study of common-practice harmony, including elementary analysis with preliminary discussion of elements of formal contrapuntal writing and chorale texture. Prerequisite: MUSIC 100 or satisfactory completion of Department of Music Theory Placement Examination. Note: Not open to students with credit in MUSIC 150.

**MUSIC 156 Music Theory II**

★3 (*fi 6*) (either term, 3-0-0). Continuing the study of common-practice harmony and elementary formal analysis. Prerequisite: MUSIC 155. Note: Not open to students with credit in MUSIC 150.

** MUSIC 165 Introduction to World Music**

★3 (*fi 6*) (either term, 3-0-0). Note: Not to be taken by students with credit in MUSIC 309.

**Note:** The ability to read music is required for all of the following courses.

**MUSIC 170 Introduction to Music History**

★3 (*fi 6*) (first term, 3-0-0). Issues in and approaches to the historical study of music. Topics drawn from a variety of musical traditions and historical periods. Prerequisite: MUSIC 100 or successful completion of the Department of Music Rudiments Placement Exam. Registration priority given to BMus, BEd Music Major/Minor, BA (Honors) Music Major, and BA Music Major/Minor students.

** MUSIC 201 Masterworks of Music**

★3 (*fi 6*) (either term, 3-0-0). A study of great works of music, chosen to represent various media and historical styles. Prerequisite: MUSIC 101 or equivalent. Note: Not open to BMus (all routes) students.

**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 209 Woodwind Techniques I**

★3 (*fi 6*) (first term, 3-0-0). Practical and theoretical instruction on single-reed instruments. Prerequisites: MUSIC 150 or 156, and 151. Corequisite or prerequisite: MUSIC 121 or 125, 124, or equivalent. Restricted to BMus (all routes), BEd Music Major/Minor, and BA Honors Music Major students.

** MUSIC 211 Woodwind Techniques II**

★3 (*fi 6*) (second term, 3-0-0). Practical and theoretical instruction on flute, oboe and bassoon. Prerequisite: MUSIC 209. Note: Restricted to BMus (all routes), BEd Music Major/Minor, and BA Honors Music Major students.

**MUSIC 213 History of Jazz**

★3 (*fi 6*) (either term, 3-0-0). A historical survey of the main evolutionary trends in jazz through analysis of distinctive jazz styles and listening to recorded examples. Prerequisite: MUSIC 100 or satisfactory completion of the Department of Music Theory Placement Examination for other than BMus (all routes) students.

**MUSIC 215 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.

** MUSIC 216 Brass Techniques I**

★3 (*fi 6*) (first term, 3-0-0). Practical and theoretical instruction on trumpet. Prerequisite: MUSIC 151 or 150 or 156. Corequisite or prerequisite: MUSIC 121 or 125, or 124 or equivalent. Note: Restricted to BMus (all routes), BEd Music Major/ Minor, and BA Honors Music Major students.

** MUSIC 217 Brass Techniques II**

★3 (*fi 6*) (second term, 3-0-0). Practical and theoretical instruction on brass instruments. Prerequisite: MUSIC 216 or proficiency examination. Note: Restricted to BMus (all routes), BEd Music Major/Minor, and BA Honors Music Major students.

** MUSIC 220 Percussion Techniques**

★3 (*fi 6*) (first term, 3-0-0). Practical and theoretical instruction on percussion instruments. Prerequisites: Music 150 or 156, and 151, or equivalent. Corequisite or prerequisite: MUSIC 121 or 125, or 124, or equivalent. Restricted to BMus (all routes), BEd Music Major/Minor, and BA Honors Music Major students.

**MUSIC 222 Second Practical Subject**

★3 (*fi 6*) (two term, 1-0-0). Note: Admission restricted to BMus (all routes) students, and BEd students majoring in secondary music education. Prerequisite: consent of Department.

**MUSIC 224 Applied Music**

★3 (*fi 6*) (two term, 1-0-0). For non BMus students. Prerequisites: MUSIC 121 or 125, or 124 or equivalent and consent of Department.

**MUSIC 225 Applied Music**

★6 (*fi 12*) (two term, 2-0-0). Restricted to BMus students. Prerequisite: MUSIC 121 or 125, or 124 or equivalent.

** 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), BEd Music Major/Minor, and BA Honors Music Major students.

** 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). Concert Band, Wind Ensemble, Academy Strings, Orchestral Winds, or Jazz Band I or II. Prerequisite: consent of Department, based on audition.

**MUSIC 245 Introduction to Music Technologies**

★3 (*fi 6*) (either term, 0-3L-0). An introduction to electronic instruments and computers, with a focus on MIDI technology, synthesizers, sequencing, and other music software programs. Prerequisites: MUSIC 151 and 156, or consent of Department.

**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 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*) (either term, 3-0-0). A continuation of the study of common-practice harmony, including larger forms and writing in a variety of textures. Prerequisites: MUSIC 150 or 155 and 156. Note: Not open to students with credit in MUSIC 250.

**MUSIC 256 Music Theory IV**

★3 (*fi 6*) (either term, 3-0-0). A continuation of the study of common-practice harmony, including larger forms and writing in a variety of textures. Prerequisite: MUSIC 255. Note: Not open to students with credit in MUSIC 250.

**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, BA (Honors) Music Major, BEd 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, BEd 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.

**[O] MUSIC 265 Introduction to Ethnomusicology**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: Music 101 or 165 or consent of Department for students not in the BMus program.

**MUSIC 271 Western Music History I**

★3 (*fi 6*) (second term, 3-0-0). Middle Ages to 1700. Prerequisite: MUSIC 170.

**MUSIC 272 Western Music History II**

★3 (*fi 6*) (first term, 3-0-0). 1700-1870. Prerequisite: MUSIC 170.

**MUSIC 273 Western Music History III**

★3 (*fi 6*) (second term, 3-0-0). 1870 to the present. Prerequisite: MUSIC 170.

**[L] MUSIC 279 Women and Music**

★3 (*fi 6*) (either term, 3-0-0). A study of music created by women and the social, cultural, and musical phenomena that have shaped women's relationships to music throughout history and across different cultures. Prerequisite: MUSIC 101 or equivalent.

**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 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 320 Diction for Singers**

★3 (*fi 6*) (two term, 0-2L-0). The application of the International Phonetic Alphabet (IPA) to singing in English, Italian, German and French. Prerequisite: MUSIC 125 (Voice), or consent of Department.

**MUSIC 328 Piano Accompaniment**

★3 (*fi 6*) (two term, 0-2L-0). Prerequisites: MUSIC 125 or equivalent, and consent of Department.

**MUSIC 342 Specialized Ensemble I**

★3 (*fi 6*) (two term, 0-4L-0). Prerequisite: consent of Department, based on audition.

**MUSIC 400 Studies in the History of Opera**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: MUSIC 271, 272, and 273.

**MUSIC 401 Studies in the History of the Symphony**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: MUSIC 272 and 273.

**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 406 Creative Service Playing for Organists**

★3 (*fi 6*) (either term, 0-3L-0). Prerequisites: MUSIC 225 or 224 and consent of Department.

**MUSIC 407 Studies in the History of the Concerto**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: MUSIC 271, 272, and 273.

**MUSIC 410 Studies in Musical Style I**

★3 (*fi 6*) (either term, 3-0-0). Forms, techniques, and styles studied through representative composers and genres of selected style periods. Prerequisite: consent of Department.

**MUSIC 411 Studies in Musical Style II**

★3 (*fi 6*) (either term, 3-0-0). Forms, techniques, and styles studied through representative composers and genres of selected style periods. Prerequisite: consent of Department.

**MUSIC 413 Studies in the History of Jazz**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: MUSIC 213.

**[L] MUSIC 416 Instrumental Conducting**

★3 (*fi 6*) (second term, 3-0-0). Prerequisite: MUSIC 315.

**[L] MUSIC 417 Choral Conducting and Pedagogy**

★3 (*fi 6*) (second term, 3-0-0). Prerequisite: MUSIC 315.

**MUSIC 422 Second Practical Subject**

★3 (*fi 6*) (two term, 1-0-0). Admission restricted to BMus (all routes) students and BEd students majoring in secondary music education. Prerequisite: consent of Department.

**MUSIC 424 Applied Music**

★3 (*fi 6*) (two term, 1-0-0). For non-BMus students. Prerequisites: MUSIC 224 or equivalent and consent of Department.

**MUSIC 425 Applied Music**

★6 (*fi 12*) (two term, 2-0-0). Restricted to BMus 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.

**[L] MUSIC 431 Band Techniques**

★3 (*fi 6*) (either term, 0-3L-0). Musical and practical aspects of band conducting. Prerequisite: A conducting course or substantial conducting experience.

**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**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: MUSIC 221 or 225, or 224, or equivalent.

**MUSIC 436 Tonal Counterpoint**

★3 (*fi 6*) (either term, 3-0-0). Elementary tonal counterpoint in two and three parts. Prerequisite: MUSIC 256.

**MUSIC 439 Vocal and Instrumental Chamber Ensemble**

★3 (*fi 6*) (two term, 0-2L-0). Prerequisite: consent of Department, based on audition.

**[O] MUSIC 440 Choral Ensemble**

★3 (*fi 6*) (two term, 0-4L-0). Concert Choir or Madrigal Singers. Prerequisite: consent of Department, based on audition.

**[O] MUSIC 441 Instrumental Ensemble**

★3 (*fi 6*) (two term, 0-4L-0). Concert Band, Wind Ensemble, Academy Strings, Orchestral Winds, or Jazz Band I or II. 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 445 Electroacoustic Music**

★3 (*fi 6*) (second term, 0-3L-0). Introduction to electroacoustic music and music involving real-time signal processing. Students will study and compose works in the electroacoustic medium and become familiar with digital and analog technology through working in the electronic music studio. Prerequisites: MUSIC 251, 250 or 256, 273.

**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 451 Aural and Keyboard Skills III**

★3 (*fi 6*) (two 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 20th-century music. Prerequisite: MUSIC 256. Note: Not open to students with credit in MUSIC 450.

**MUSIC 456 Music Theory VI**

★3 (*fi 6*) (second term, 3-0-0). Analysis of pieces from tonal and atonal repertoires. Prerequisite: MUSIC 256. Note: Not open to students with credit in MUSIC 450.

**MUSIC 460 Composition**

★6 (*fi 12*) (two term, 3-0-0). A sequent course to MUSIC 259 and 260 with emphasis on the study of, and writing in, larger forms. Note: Public performance of works completed in the course will be expected. Registration priority given to BMus, BA (Honors) Music Major, BEd Music Major/Minor, and BA Music Major students.

**MUSIC 463 Orchestration**

★3 (*fi 6*) (second term, 3-0-0). A detailed study of orchestration and its historical developments. Prerequisite: MUSIC 263.

**MUSIC 471 The Music of Bach**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: MUSIC 201 or equivalent.

**MUSIC 473 The Music of Mozart**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: MUSIC 201 or equivalent.

**MUSIC 475 The Music of Beethoven**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: MUSIC 201 or equivalent.

**MUSIC 477 The Music of Stravinsky**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: MUSIC 201 or equivalent.

**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.**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 6*) (two term, 1-0-0). Admission restricted to BMus (all routes) students and BEd students majoring in secondary music education. Prerequisite: consent of Department.**MUSIC 524 Applied Music**★3 (*fi 6*) (two term, 1-0-0). For non-BMus students. Prerequisites: MUSIC 424 or equivalent, and consent of Department.**MUSIC 525 Applied Music**★6 (*fi 12*) (two term, 2-0-0). Restricted to BMus students.**MUSIC 526 Senior Recital**★3 (*fi 6*) (two term, unassigned). Corequisite: MUSIC 525. A formal recital prepared under the guidance of the applied music instructor. Required of students in the BMus (Honors) Performance program and BMus (Performance) program and also available to BMus students with consent of Department.**MUSIC 539 Vocal and Instrumental Chamber Ensemble**★3 (*fi 6*) (two term, 0-2L-0). Prerequisite: consent of Department, based on audition.**MUSIC 540 Choral Ensemble**★3 (*fi 6*) (two term, 0-4L-0). Concert Choir or Madrigal Singers. Prerequisite: consent of Department, based on audition.**MUSIC 541 Instrumental Ensemble**★3 (*fi 6*) (two term, 0-4L-0). Concert Band Wind Ensemble, Academy Strings, Orchestral Winds, or Jazz Band I or II. 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 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 456.**MUSIC 556 Seminar in Music Theory**★3 (*fi 6*) (either term, 0-3s-0). Prerequisites: MUSIC 256 and consent of Department.**MUSIC 560 Composition**★6 (*fi 12*) (two term, 3-0-0). Emphasis is given to the study of, and writing for, larger groups of voices and instruments. Note: Public performance of works completed in the course will be expected. Registration priority given to BMus, BA (Honors) Music Major, BEd Music Major/Minor, and BA Music Major students. Prerequisite: MUSIC 460. Corequisite or prerequisite: MUSIC 263.**MUSIC 565 Area Studies in Ethnomusicology**★3 (*fi 6*) (either term, 3-0-0). Undergraduate students require MUSIC 265 as a prerequisite.**MUSIC 566 Topics in Ethnomusicology**★3 (*fi 6*) (either term, 3-0-0). Undergraduate students require MUSIC 265 as a prerequisite.**MUSIC 581 Studies in Avant Garde Music**★3 (*fi 6*) (either term, 3-0-0). Prerequisite: MUSIC 455.**Graduate Courses**

**Note:** The following undergraduate courses may be taken for credit by graduate students: MUSIC 320, 400, 401, 406, 407, 410, 411, 413, 427, 436, 438, 445, 501, 502, 505, 507, 508, 525, 542, 555, 556, 560, 561, 565, 566, 581.

**MUSIC 601 Tutorial Study**★3 (*fi 6*) (either term, 3-0-0). Prerequisite: consent of Department.**MUSIC 608 Seminar in 20th-Century Music**★3 (*fi 6*) (either term, 0-3s-0).**MUSIC 610 Current Topics in Music Research I**★3 (*fi 6*) (first term, 0-3s-0). A study of current research in musicology, music theory, ethnomusicology, and the interdisciplinary studies of music, focusing on methodological issues. Prerequisite: consent of Department.**MUSIC 611 Current Topics in Music Research II**★3 (*fi 6*) (second term, 0-3s-0). Continuation in the study of theory, ethnomusicology, and the interdisciplinary studies of music, focusing on methodological issues. Prerequisite: consent of Department.**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 12*) (two term, 2-0-0).**MUSIC 623 Supplementary Applied Music**★3 (*fi 6*) (two term, 1-0-0). Prerequisite: consent of Department.**MUSIC 630 Choral Conducting**★6 (*fi 12*) (two term, 3-0-0).**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 639 Vocal and Instrumental Chamber Ensemble**★3 (*fi 6*) (two term, 0-2L-0). Prerequisite: consent of Department, based upon audition.**MUSIC 640 Choral Ensemble**★3 (*fi 6*) (two term, 0-4L-0). Concert Choir or Madrigal Singers. Prerequisite: consent of Department, based upon audition.**MUSIC 641 Instrumental Ensemble**★3 (*fi 6*) (two term, 0-4L-0). Concert Band Wind-Ensemble, Academy Strings, Orchestral Winds, or Jazz Band I or II. Prerequisite: consent of Department, based upon audition.**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 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 Composition**★6 (*fi 12*) (two term, 3-0-0).**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 695 Case Study in Ethnomusicology**★1 (*fi 2*) (either term, 0-1s-0).**MUSIC 696 Case Study in Musicology**★1 (*fi 2*) (either term, 0-1s-0).**MUSIC 697 Case Study in Music Theory**★1 (*fi 2*) (either term, 0-1s-0).**MUSIC 699 Directed Research**★3 (*fi 6*) (either term, 3-0-0).**MUSIC 721 Special Projects in Keyboard Music**★6 (*fi 12*) (two term, 2-0-0).**MUSIC 739 Special Projects in Chamber Music**★3 (*fi 6*) (two term, 0-2L-0). Restricted to Doctor of Music students.

**201.151 Musique, MUSIQ**

Faculté Saint-Jean

**Cours de 1er cycle****MUSIQ 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 prendre ce cours. Anciennement MUSIQ 200.

**📌 MUSIQ 101 Introduction à la musique**

★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. Anciennement MUSIQ 206.

**MUSIQ 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. Prérequis: MUSIQ 100 ou l'équivalent mesurable par un test sur les rudiments de la musique. Note: ce cours est réservé aux étudiants du BEd. Anciennement MUSIQ 203.

**MUSIQ 124 Musique appliquée**

★3 (fi 6) (aux deux semestres, 1-0-0). Leçons de chant individuelles pour les étudiants non inscrits au BMus. Prérequis: accord du professeur après audition.

**📌 MUSIQ 140 Ensemble choral**

★3 (fi 6) (aux deux semestres, 0-4L-0). Cours de chant choral. Prérequis: accord du professeur après audition.

**MUSIQ 151 Culture de l'oreille et facilité au clavier I**

★3 (fi 6) (aux deux semestres, 0-3L-0). Perception auditive des matières couvertes en MUSIQ 155 et 156, par la mise en pratique de la lecture à vue, de la dictée et de l'harmonie au clavier. Prérequis: MUSIQ 100 ou l'équivalent mesurable par un test de placement en théorie musicale de la Faculté et un examen sur les habiletés auditives sauf pour les étudiants du BMus. Corequis: MUSIQ 155 et 156. Note: Un demi-cours qui s'étale sur les deux semestres. Anciennement MUSIQ 251.

**MUSIQ 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. Prérequis: MUSIQ 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 des crédits pour MUSIQ 150.

**MUSIQ 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. Prérequis: MUSIQ 155.

**📌 MUSIQ 201 Les chefs-d'oeuvre de la musique**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Une étude des plus grands chefs-d'oeuvre musicaux choisis pour représenter divers moyens d'expression et divers styles historiques. Prérequis: MUSIQ 101 ou l'équivalent. Anciennement MUSIQ 306.

**MUSIQ 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. Prérequis: MUSIQ 101 ou l'équivalent. Anciennement MUSIQ 315.

**MUSIQ 224 Musique appliquée**

★3 (fi 6) (aux deux semestres, 1-0-0). Leçons de chant individuelles pour les étudiants non inscrits au BMus. Prérequis: MUSIQ 124 ou l'équivalent et l'accord du professeur.

**📌 MUSIQ 240 Ensemble choral**

★3 (fi 6) (aux deux semestres, 0-4L-0). Cours de chant choral. Prérequis: accord du professeur après audition.

**MUSIQ 315 Introduction à l'art de diriger**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Prérequis: MUSIQ 151 et 156, ou l'équivalent.

**MUSIQ 440 Ensemble choral**

★3 (fi 6) (aux deux semestres, 0-4L-0). Cours de chant choral. Prérequis: accord du professeur après audition.

**MUSIQ 471 La musique de Bach**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Prérequis: MUSIQ 201, ou l'équivalent.

**MUSIQ 473 La musique de Mozart**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Prérequis: MUSIQ 201 ou l'équivalent.

**201.152 Native Studies, NS**

School of Native Studies

**Undergraduate Courses****NS 100 Introduction to Native Studies**

★3 (fi 6) (either term, 3-0-0). This course will introduce the discipline and expectations of Native Studies to the student by emphasizing research and writing skills necessary in an academic environment. The subject matter for the course will come from such areas as the cultural histories and an analysis of contemporary conditions of Native societies in Canada.

**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.

**📌 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.

**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 210 Native Issues and Insights I**

★3 (fi 6) (either term, 3-0-0). An overview of various background issues in Native Studies that continue to have a definite impact on the contemporary Canadian Aboriginal situation. The focus of the course will be from a Native Studies perspective and deal with issues such as Aboriginal rights, conditions regarding land claims, and colonialism.

**📌 NS 211 Native Issues and Insights II**

★3 (fi 6) (either term, 3-0-0). An overview of various major issues facing Canadian aboriginal peoples and governments today, including a comparison with issues for indigenous peoples elsewhere. The focus of the course will be from a Native Studies perspective and deal with issues such as land, self-government, economic development, education, and health.

**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.

**NS 300 Traditional Cultural Foundations I**

★3 (fi 6) (either term, 3-0-0). This course is intended to introduce students to Native traditions 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. They will be contrasted with stereotypes and mythologies about Native peoples. Students will learn why such stereotypes developed and why they still persist.

**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 210 and 211 or consent of the School.

**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 210 and 211 or consent of the School.

**NS 340 Aboriginal Legal Issues**

★3 (fi 6) (either term, 3-0-0). A general and critical overview of the legal issues affecting Native people, with particular reference to Alberta and the NWT. Special attention will be given to the Constitutional Act of Canada, selected federal and provincial legislation, treaties, and major court cases to introduce current application of Native law. Prerequisites: NS 210 and 211 or consent of the School.

**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 210 and 211 or consent of the School.

#### **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 210 and 211 or consent of the School.

#### **NS 360 Contemporary Native Art**

★3 (*fi 6*) (either term, 3-0-0). A 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 mainstream Canadian Native artists, as well as on Canadian Native artists that are part of the Northwest Coast, Plains, Woodland, Algonquin, and Pan-Indian schools of art. Prerequisites: NS 210 and 211 or consent of the School.

#### **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 210 and 211 or consent of the School.

#### **NS 375 Native Health Issues**

★3 (*fi 6*) (either term, 3-0-0). This course is designed to introduce students to selected contemporary health care issues in Alberta Métis and Indian communities. A description of the existing health status of these populations will facilitate exploration of socio-economic issues of disease prevention, illness treatment and health promotion. Concepts of health, illness and disease from several points of view will provide a foundation for discussion of issues associated with Native control of health care planning delivery. Prerequisites: NS 210 and 211 or consent of the School.

#### **NS 380 Selected Topics in Native Studies**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: NS 210 and 211 or consent of the School.

#### **NS 381 Selected Topics in International Indigenous Studies**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: NS 210 and 211 or consent of the School.

#### **NS 390 Community Research Methods**

★3 (*fi 6*) (either term, 3-0-0). An introduction to the basic concepts, principles, and issues in the area of community research. The objective of the course is to both apply and critique a range of research methods and to describe different facets of a community. Research methods, particularly in relation to the oral traditions of Indigenous peoples, will be a focus of the course. Prerequisites: NS 210 and 211 and one other 300-level NS course.

#### **NS 400 Traditional Cultural Foundations II**

★3 (*fi 6*) (either term, 3-0-0). This course will use case studies to examine the range of Native societies in North America and how these distinctive societies have maintained their unique identities over time, while experiencing often-considerable culture change as they have coped with new circumstances, both positive and negative. Students will consider how Native peoples are drawing upon earlier cultural forms in creative ways to meet modern needs, emphasizing that "traditional cultural forms" are dynamic.

#### **NS 403 Selected Topics in Native Studies**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: One 300-level course or consent of the School.

#### **NS 404 Selected Topics in Native Studies**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: One 300-level course or consent of the School.

#### **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 School.

#### **NS 408 Conference Course in Native Studies**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: One 300-level course or consent of the School.

#### **NS 409 Conference Course in Native Studies**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: One 300-level course or consent of the School.

#### **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 School.

#### **NS 430 Native Land Use Research and Planning**

★3 (*fi 6*) (either term, 3-0-0). This course will approach land use research and planning as it applies specifically to traditional Native land use. Two perspectives will be considered. Native land use research will be examined to demonstrate land use and occupancy to support Native land claims. Planning the use of Native lands and resources by incorporating traditional and contemporary usage and management methods into land use plans will be the second thrust. Included in the course are the land claims process; control of land and management of resources; land use planning in the context of Native self-government; and the roles of resource development and the traditional sector of Native economies. Issues such as Native participation in the co-management of resources affecting traditional Native lands and economies, the cultural applications of land use research and indigenous values, and practices of land use will also be covered. Prerequisite: One 300-level course or consent of the School.

#### **NS 440 Treaties and Indigenous Land Claims Agreements**

★3 (*fi 6*) (either term, 3-0-0). An exploration of the contemporary issues associated with treaties and indigenous land claims agreements. The background, negotiations, and implementation of post-1867 Indian treaties and modern agreements in Canada will be one focus for the course. Another focus will be the experiences of indigenous peoples with Treaties elsewhere in the world, such as the Treaty of Waitangi in New Zealand and selected Indian treaties in the United States of America. This course will be taught in a seminar format. Prerequisite: NS 340 or 390 or consent of the School.

#### **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 211 and one 300-level course (NS 330 or NS 345 recommended).

#### **NS 470 Métis Politics**

★3 (*fi 6*) (either term, 3-0-0). This seminar concentrates on recent events, processes, and issues. It examines the political attitudes, opinions, and activities of Métis peoples, as well as organizations and their leaders. Similarities between the politics of Métis and Indian collectivities are explored. Considerable attention is given to the strategy and tactics employed by Métis in dealing with the provincial and federal governments. Prerequisite: NS 370 or History 369 or consent of the School. POL S 100 or 320 or 321 strongly recommended.

#### **NS 480 Métis/Indian/Inuit Issues Seminar**

★3 (*fi 6*) (either term, 3-0-0). A seminar in which an examination is made of current issues facing indigenous peoples. Topics are selected from contemporary developments in major areas of interest including educational and vocational implications of land claims and self government settlements; Métis, Indian and Inuit perspectives on the environment, development, and cultural arts. Emphasis is given to the comparative analysis of such issues at the regional, national and international levels. Prerequisite: One 300-level course or consent of the School.

#### **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 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 School of Native Studies. Normally consent will not be given without credit in NS 390.

#### **NS 520 Honors Paper (or Project)**

★6 (*fi 12*) (two term, unassigned). For students in the Honors program in Native Studies in their final year.

## 201.153 Neuroscience, NEURO

Faculty of Medicine and Dentistry

**Note:** Additional courses in Neuroscience are offered by members of the division through individual departments such as Pharmacology, Physiology, Psychiatry, Psychology, Surgery, and Zoology.

### Undergraduate Courses

#### NEURO 450 Honors Tutorial

★3 (*fi 6*) (either term, 3-0-0). A tutorial course for fourth-year students in the Honors program in Neuroscience. Each student will participate in a series of tutorials on a selected topic with a member of the Division of Neuroscience. Completion of this course requires an oral presentation to an examining committee. Prerequisites: PMCOL 371, PHYSL 372, and PSYCO 377. Only open to Honors students.

#### NEURO 451 Honors Research

★3 (*fi 6*) (either term, 0-0-3). Fourth-year students in the Honors program in Neuroscience will pursue a research project under the supervision of a member of the Division of Neuroscience. Completion of this course requires a written report of the project and an oral presentation to an examining committee. Prerequisites: PMCOL 371, PHYSL 372, and PSYCO 377. Only open to Honors students.

#### NEURO 472 Neuroscience II: Systems

★3 (*fi 6*) (second term, 3-0-0). Lectures presented by the Faculty of Science and the Faculty of Medicine and Dentistry on visual and somatosensory systems, motor control via reflexes and central pattern generators; homeostasis, control of feeding, drinking, temperature and reproduction; neurobehavioral aspects of attention, arousal, cognition, memory and cerebral asymmetry. Prerequisite: PHYSL 210 or PSYCO 275 or ZOOL 241 or equivalent.

### 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 Division's Graduate Committee. Students are expected to complete a research project, supervised by a member of the Division, in each of the research areas chosen. Students are evaluated on both their performance in the laboratory and reports written. Prerequisite: consent of the Division.

#### NEURO 503 Seminar in Neuroscience

★0 (*fi 2*) (two term, 0-1s-0). Neuroscientists from the University of Alberta and other institutions present their research findings and review recent literature in 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 Division. Division members are invited to attend.

## 201.154 Norwegian, NORW

Department of Modern Languages and Cultural Studies:  
Germanic, Romance, Slavic  
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, or they may be encouraged to seek "Credit by Special Assessment" (see §44.5) where 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 course, credit may be withheld.
- (4) See also Scandinavian (SCAND) listings.

### Undergraduate Courses

#### NORW 100 Elementary Norwegian

★6 (*fi 12*) (two term, 3-0-2). Designed to give basic practical skill in everyday spoken and written Norwegian. The oral approach, using the laboratory, is followed. Formerly SCAND 100.

#### NORW 200 Second-Year Norwegian

★6 (*fi 12*) (two term, 3-0-1). Reading and study of selected texts in Norwegian literature and culture. Composition and conversation. Prerequisite: NORW 100 or consent of Department. Formerly SCAND 300.

## 201.155 Nursing, NURS

Faculty of Nursing

### Undergraduate Courses

#### NURS 120 Integrated Psychology I

★3 (*fi 6*) (first term, 3-0-0). Introductory psychology concepts integrated into nursing through context-based learning.

#### NURS 121 Integrated Psychology II

★3 (*fi 6*) (second term, 3-0-0). Continuation of the study of psychology concepts integrated into nursing through context-based learning.

#### NURS 130 Integrated Sociology

★3 (*fi 6*) (two term, 1.5-0-0). Introductory sociology concepts integrated into nursing through context-based learning.

#### NURS 140 Anatomy

★3 (*fi 6*) (two term, 1.5-0-0). Introduction to the structure of the human body.

#### NURS 150 Elementary Physiology

★4 (*fi 8*) (two term, 3-0-0; 1-0-0). An introduction to human physiology. Available only to nursing students. Note: NURS 150 and PHYSL 162 may not both be taken for credit.

#### NURS 151 Elementary Physiology

★2 (*fi 4*) (two term, 1-0-0). An introduction to human physiology. Available only to nursing students. Note: NURS 150 and PHYSL 162 may not both be taken for credit.

#### NURS 190 Nursing in Context A

★7 (*fi 14*) (first term, 0-4.5s-2). 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

★3 (*fi 6*) (first term, 0-1s-6.5c). Beginning nursing practice with a focus on health promotion and interaction with clients across the life span in a variety of non-traditional settings. Corequisite: NURS 190.

#### NURS 194 Nursing in Context A1

★5 (*fi 10*) (second term, 0-6s-3 in 7 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. Prerequisites: NURS 190, 191.

#### NURS 195 Nursing Practice II

★6 (*fi 12*) (second term, 0-3s-24c 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, 191.

#### NURS 200 Nursing II

★3 (*fi 6*) (either term, 3-0-0). Focuses on nursing care of individuals. Selected nursing roles, strategies and factors that influence role implementation will be explored. Prerequisite: NURS 107.

#### NURS 201 Teaching and Learning

★3 (*fi 6*) (first term, 3-0-0). Introduction to theories and practice of teaching and learning. Focus will be on the process of teaching and learning situations in the health care field. Prerequisite: NURS 101. Prerequisite or corequisite: PSYCO 104.

#### NURS 202 Pathophysiology

★3 (*fi 6*) (first term, 3-0-0). Introduction to pathological processes. The course will focus on the general principles of disease and disorders that affect the body as a whole. Prerequisite: NURS 108 or PHYSL 162.

**NURS 203 Nursing Care of Individuals Within Families: Adult/Older Adult**

★9 (*fi 18*) (either term, 4-15c-0). Theory and practice related to nursing care of adults and older adults and their families in medical-surgical settings. Students will have the opportunity to interact with a family through home visits. Prerequisites for Collaborative students: NURS 103, 107. Prerequisites or corequisites: NURS 201, 202. Prerequisites for RPN to BScN students: NURS 204, 210.

**NURS 204 Nursing Care of Individuals Within Families: Child-Bearing/Child-Rearing**

★9 (*fi 18*) (either term, 4-15c-0). Theory and practice related to nursing care of individuals in child-bearing and child-rearing families in community and hospital settings. Students will have the opportunity to interact with a family through home visits. Prerequisites for Collaborative students: NURS 103, 107. Prerequisites or corequisites: NURS 201, 202.

**NURS 205 Clinical Nursing Practice II**

★6 (*fi 12*) (Spring/Summer, 200 hours). Includes theory and practice components. The primary focus will be client-centred nursing care of hospitalized adults and children. Prerequisites for Collaborative students: NURS 107, 200, 202, 203, 204. Prerequisites for RPN to BScN students: NURS 203, 204, 368.

**NURS 210 Professional Nursing**

★3 (*fi 6*) (either term, 3-0-0). Focuses on the profession of nursing, including historical perspectives, roles, functions and strategies; levels of organization; models of nursing, and trends in the health care system. Factors influencing health practices across the lifespan will also be examined.

**NURS 213 Health Sciences**

★4 (*fi 8*) (either term, 3-0-3). A combined course including the following components: Introduction to Primary Health Care and Health Promotion, Introduction to Health Assessment, Anatomy, and Medical Microbiology. Notes: (1) Students may receive advanced credit for previous work for any of these components. (2) Course available to Post-RPN students only.

**NURS 244 Integrated Medical Microbiology**

★3 (*fi 6*) (two term, 1.5-0-0). Relevant medical microbiology concepts integrated into nursing through context-based learning.

**NURS 290 Nursing in Context B**

★5 (*fi 10*) (first term, 0-6s-3 in 7 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 194, 195.

**NURS 291 Nursing Practice III**

★7 (*fi 14*) (either term, 0-3s-28c 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. (See Note at end of section.) Prerequisites for Collaborative students: NURS 194, 195. Prerequisites for Post-RPN students: NURS 293, 295.

**NURS 293 Nursing in Context and Practice of Families in Transition**

★5 (*fi 10*) (either term, 0-6s-3c in 7 weeks). Theory and practice related to health promotion of childbearing/child-rearing families with a focus on primary health care with families in transition. Prerequisite or co-requisite: NURS 213. Note: This course is available to Post-RPN students only.

**NURS 294 Nursing in Context B1**

★5 (*fi 10*) (second term, 0-6s-3 in 7 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, 0-3s-28c in 7 weeks or 0-1.5s-15c in 13 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 in homes or in community-based settings. (Note: Focus for Post-RPN students will be on childbearing/child-rearing families.) Prerequisites for Collaborative students: NURS 194, 195. Pre- or corequisites for Post-RPN students: NURS 213, 293.

**NURS 300 Nursing III**

★3 (*fi 6*) (either term, 3-0-0). Focuses on nursing care related to families, with emphasis on selected nursing roles, strategies and factors that influence role implementation. Prerequisite for Collaborative students: NURS 205. Prerequisite for Post-RN students: NURS 319 or equivalent. Prerequisites for RPN to BScN students: NURS 205, 210, 319 or equivalent.

**NURS 301 Nursing Research**

★3 (*fi 6*) (either term, 3-0-0; or 6-0-0 in 7 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: Statistics elective. Note: (NURS 301 and STAT [★3]) and (NURS 397 and 497) may not both be taken for credit.

**NURS 302 Community Based Nursing of Families and Groups**

★9 (*fi 18*) (either term, 4-15c-0). Theory and practice related to the health promotion of families and small groups within the context of primary health care. Attention also will be given to nursing care of families experiencing episodic or continuing health concerns. Students will develop skills in utilizing a variety of theories and models to assist families and small groups in community settings toward optimal functioning. Prerequisite or corequisite for all students: NURS 300, Family Elective. Additional prerequisite for Post-RN students: NURS 319 or equivalent. Additional prerequisites for RPN to BScN students: NURS 205, 319, or equivalent.

**NURS 303 Mental Health Nursing**

★9 (*fi 18*) (either term, 4-15c-0). The focus is on theory and practice related to the promotion of mental health and care of clients with mental health problems and mental health disorders. Students will further develop and integrate their skills in promoting optimal client functioning in hospital and community settings. Prerequisites: PSYCO 105; NURS 201, 202, 203, 204. In addition, successful completion of NURS 205 is required for students proceeding to Year Three.

**NURS 319 Developmental Assessment**

★3 (*fi 6*) (either term, 3-0-0). Focus is on the assessment of age-appropriate human physical, cognitive and social development from conception to death.

**NURS 340 Advanced Interpersonal Communication Skills: The Process for Promoting Health**

★4 (*fi 8*) (either term, 3-0-1). Development of advanced interpersonal communication skills for the teaching and health counselling roles assumed by health professionals. The students will have the opportunity to relate course content to their own area of interest through discussion and practice. Prerequisite: PSYCO 104 or equivalent.

**NURS 350 Comparison of Two Health Care Systems in the Area of Mental Health Care and Well Being**

★4 (*fi 8*) (second term, 0-3s-70c). Mental health care in two different health care systems: Canada and The Netherlands. Focus is on health and illness of individuals, community, and society; foundational values underlying the health care system and health policy; and cultural structures affecting health care delivery. Two weeks of clinical hours in Nijmegen, The Netherlands, which includes site visits to agencies and institutions. Coursework is in English.

**NURS 368 Health Assessment**

★4 (*fi 8*) (either term, 3-0-3). Focus is on the health assessment of the well adult, with normal 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.

**NURS 385 Clinical Practice for Post-RNs**

★7 (*fi 14*) (second term, 0-3s-28c in 7 weeks or 0-1.5s-15c in 13 weeks). Nursing practice focuses on health promotion and disease prevention of clients across the life-span. Practice occurs in homes or community-based settings. Prerequisites: NURS 368, 393, 397. Note: Course is for Program-1 Post-RN students only.

**NURS 390 Nursing in Context C**

★5 (*fi 10*) (first term, 0-6s-3 in 7 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 for Collaborative students: NURS 291, 294, 295. Pre- or corequisite for Post-RPN students: NURS 291.

**NURS 391 Nursing Practice V**

★7 (*fi 14*) (either term, 0-3s-28c 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 for Collaborative students: NURS 291, 294, 295. Prerequisites for Post-RPN students: NURS 291.

**NURS 393 Transition to Post RN Program I**

★4 (*fi 8*) (first term, 0-3s-3 in 7 weeks). Introduction to the Post-RN program, with a focus on primary health care, family, community, nursing research and statistics, and concepts from physical sciences, medical sciences, social sciences, and humanities. Note: Course is for Program-1 Post-RN students only.

**NURS 394 Nursing in Context C1**

★5 (*fi 10*) (second term, 0-6s-3 in 7 weeks). Continuation of NURS 390 with increasing situational complexity. Prerequisites for Collaborative students: NURS 390 and NURS 391, 395. Prerequisite for Post-RPN students: NURS 390 and Pre- or corequisite of NURS 391. Prerequisites for Program-1 Post-RN students; NURS 393, 397. Prerequisites for Program-2 Post-RN students: NURS 390, 391.

**NURS 395 Nursing Practice VI**

★7 (*fi 14*) (either term, 0-3s-28c 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 will occur in homes or in community-based setting. Prerequisites: NURS 291, 294, 295.

#### **NURS 396 Transition to Post-RN Program II**

★4 (fi 8) (first term, 0-3s-3 in 7 weeks or 0-1.5s-1.5 in 13 weeks). Focus is on additional concepts related to primary health care, family, community, nursing research and statistics, and concepts from physical sciences, medical sciences, social sciences, and humanities. Pre- or corequisite for Program-1 Post-RN students: NURS 393. Note: Course is for Program-1 Post-RN students only.

#### **NURS 397 Nursing Research and Statistics I**

★2 (fi 4) (first term, 0-2.5s-1.5 in 7 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. Also included are introduction of descriptive and inferential statistics, and the application of statistical methods to nursing problems. Corequisite for Collaborative and Post-RPN students: NURS 390; Corequisites for Post-RN Program-1 students: NURS 393, 396; Corequisite for Post-RN Program-2 students: NURS 394. Note: NURS 397 and 497, and NURS 301 and STATS [★3] may not both be taken for credit.

#### **NURS 400 Nursing IV**

★4 (fi 8) (either term, 4-0-0). Theory and practice related to nursing care of aggregates, with emphasis on principles of epidemiology, health promotion and primary health care. Selected nursing roles, strategies and factors that influence role implementation will be included. Prerequisite for Collaborative students: NURS 300; Prerequisites or corequisites: NURS 301, 302, 303. Prerequisite for Post-RN and RPN to BScN students: NURS 300; Prerequisites or corequisites: NURS 301, 302. There is a consolidated final exam in this course.

#### **NURS 401 Nursing Management**

★4 (fi 8) (either term, 3-0-3). Introduction to the theory and practice of management applied to settings where nurses work. Emphasis will be placed on theories of organization, management, and leadership, as well as on selected nursing systems and worklife issues. The practice component will include a variety of learning experiences in health care settings or in seminars and simulations. Prerequisites for Collaborative students: NURS 300, 301, 302, 303. Prerequisites for Post-RN students: NURS 300, 301, 302. Prerequisites for RPN to BScN students: NURS 300, 302. Prerequisite or corequisite: NURS 301.

#### **NURS 402 Nursing Trends and Issues**

★2 (fi 4) (either term, 0-2s-0). A variety of current professional, social, political, and global trends and issues affecting the nursing profession and health care system within Canada will be addressed. Students will have the opportunity to examine, analyze, and evaluate selected trends and issues. Prerequisites: NURS 300, 302. Additional prerequisite for Collaborative students: NURS 303.

#### **NURS 403 Senior Nursing Elective**

★9 (fi 18) (either term, variable). Theoretical and clinical course focusing on knowledge and practice in a selected area of nursing. Prerequisites for Collaborative students: NURS 300, 301, 302, 303. Prerequisites for Post-RN students: NURS 300, 301, 302. Prerequisites for RPN to BScN students: NURS 203, 204, 205, 210, 211, 368.

#### **NURS 404 Senior Nursing Practicum**

★5 (fi 10) (either term, 0-35c-0 in 7 weeks). Clinical practicum which provides students with the opportunity to practise nursing with a selected group of clients in a particular setting. Focus will be on integration of previous learning and transition to the graduate role. Prerequisites: NURS 301, 302, 303, 403.

#### **NURS 420 Cross-Cultural Colloquium**

★3 (fi 6) (either term, 0-3s-0). Focus is on the development of cross-cultural, cross-national communication and collaboration skills among students. Students gain insight into their own cultural beliefs, assumptions, and values, and how these influence their nursing practice as well as the cultural beliefs and values of students in the partner countries. Computer-mediated communication will aid students in forming a collaborative network for the exchange of ideas and resources to address common problems and issues, such as, the global effects of technology; health, sociopolitical, and economic policies; restructuring of health care systems; and urban/rural health care delivery.

#### **NURS 453 Nursing Care of the Normal and High Risk Newborn**

★3 (fi 6) (first term, 3-6c-0). Application of physiological principles to the nursing care of the newborn, preterm and sick infant. The effect of ongoing psychological and social needs in relations with the mother and father. The management of life-support systems in the care of the immature or sick newborn. Prerequisite: consent of Instructor.

#### **NURS 490 Nursing in Context D**

★5 (fi 10) (either term, 0-6s-3 in 7 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 for Collaborative students: NURS 391, 394, 395. Prerequisites for Post-RPN

students: NURS 391, 394. Prerequisites for Program-1 Post-RN students: NURS 385, 394. Prerequisites for Program-2 Post-RN students: NURS 394, 395.

#### **NURS 491 Nursing Practice VII**

★7 (fi 14) (either term, 0-3s-28c in 7 weeks). Management and care of clients in ambiguous, complex, situations occurring over a variety of settings. Pre- or corequisite: NURS 490.

#### **NURS 493 Nursing Intervention in Neonatal Intensive Care**

★3 (fi 6) (second term, 3-6c-0). Nursing care of the high risk infant in a neonatal intensive care unit. Trends and issues in neonatal care will be examined with emphasis on the impact of acute and chronic illness on the physical and psychosocial well-being of the family. Prerequisite: NURS 453 or consent of Instructor.

#### **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 specific area of practice. Prerequisites for Collaborative students: NURS 391, 394, 395. Prerequisites for Post-RPN students: NURS 391, 394. Prerequisites for Program-1 Post-RN students: NURS 385, 394. Prerequisites for Program-2 Post-RN students: NURS 394, 395.

#### **NURS 495 Nursing Practice VIII**

★9 (fi 18) (either term, 0-1s-34c in 10 weeks). Comprehensive approach to professional practice of nursing in an area of special interest to the student. Pre- or corequisite: NURS 494.

#### **NURS 497 Nursing Research and Statistics II**

★4 (fi 8) (either term, 0-5.5s-2 in 7 weeks). Examination of the process of research continues 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. Descriptive and inferential statistics, and the application of statistical methods to nursing problems are included. Corequisite: NURS 490. Note: NURS 397 and 497 and NURS 301 and STATS [★3] may not both be taken for credit.

#### **NURS 498 Special Studies in Nursing**

★1-12 (variable) (either term, variable).

## Graduate Courses

#### **NURS 502 Nature and Development of Nursing Knowledge**

★3 (fi 6) (either term, 0-3s-0). Enquiry into the nature, scope, and object of nursing knowledge; the distinct contribution of nursing art, philosophy, history, and science. Includes exploration of nursing theories/frameworks. Prerequisite: consent of Instructor.

#### **NURS 503 Design and Conduct of Nursing Research**

★3 (fi 6) (either term, 3-0-0). Experimental, quasi-experimental, historical, and descriptive approaches to the investigation of nursing phenomena.

#### **NURS 510 Advanced Health Assessment and Applied Pathophysiology (Adult)**

★4 (fi 8) (either term, 0-3s-6c). The focus of this course is on developing advanced assessment skills for diagnostic reasoning and clinical decision making in relation to common variations in the health status of adults. Students will focus on specialized assessment and applied pathophysiology in relation to specific adult populations. Opportunities to apply diagnostic reasoning skills and formulate clinical decisions required for the development of specific health care management strategies is provided through seminars, laboratory practice, and a clinical practicum in a range of health care settings.

#### **NURS 512 Assessment for Community and Population Health**

★4 (fi 8) (either term, 0-3s-6c). The focus of this course is nursing assessment of communities and other populations as a foundation for program planning in health promotion and disease prevention. The content includes use of data about community capacity, health status characteristics, and the causes and distribution of disease. Emphasis will be placed on a socio-environmental approach to health, including the social determinants of health and disease.

#### **NURS 513 Advanced Health Assessment and Applied Pathophysiology (Child)**

★4 (fi 8) (either term, 0-3s-6c). The focus of this course is to develop advanced assessment skills for diagnostic reasoning and clinical decision making in relation to health promotion and common variations in the health status of children from infancy to 16 years of age. Students will focus on specialized assessment and applied pathophysiology in relation to specific paediatric populations. The opportunity to apply diagnostic reasoning skills and formulate clinical decisions required for the development of specific health care management strategies is provided in a range of health care settings in which children and their families are the primary focus.

#### **NURS 521 Advanced Perinatal Physiology**

★3 (fi 6) (either term, 3-0-0). Basic and clinical lectures on research on neonatal physiology and health problems of the infant with reference to current therapeutics including pharmacology. Prerequisite: PAEDS 501 or consent of Instructor.

**NURS 524 Advanced Neonatal Intensive Care Nursing**

★6 (fi 12) (either term, 0-3s-6). Students will have an opportunity to integrate theory from the psychosocial and physiological perspectives with the care of ill newborns and their families with emphasis on anticipatory guidance, education, and health promotion. Clinical placement will be in a Level III nursery with follow-up after discharge of the infant. Prerequisite: consent of Instructor.

**NURS 529 Advanced Neonatal Intensive Care Nursing Practicum**

★6 (fi 12) (Spring/Summer, 0-40c-0). During this experience in Spring/Summer the students will acquire skill and experience in functioning in an advanced role under the preceptorship of selected nurses and neonatologists working in an expanded role. Prerequisite: NURS 524.

**NURS 531 Community Health: Practice and Research Perspectives**

★3 (fi 6) (second term, 0-3s-0). Concepts and research concerning health promotion and disease prevention in community settings will be addressed. Emphasis will be given to implications for multidisciplinary practice from epidemiology, public policy, development, and program planning and evaluation. Theoretical content will pertain to multiple client groups in the community as well as environmental and social conditions.

**NURS 532 Family Health and Wellness**

★3 (fi 6) (either term, 0-3s-0). This course is focused on models of family health and related research. Both the health of families and the family's influence on health will be examined. Measurement and assessment issues will be discussed. Applications to nursing and other health-related disciplines will be explored. Co-taught by Faculty of Nursing and Department of Human Ecology.

**NURS 534 Advanced Practice in Community Health Nursing**

★4 (fi 8) (second term, 0-3s-6c). Concepts and research concerning nursing and health promotion in community settings will be addressed with emphasis given to implications for the nursing role. Theoretical content will pertain to multiple client groups in the community. Students will select one level of client (population, group, aggregate, or families) for nursing practice within a community health model. Pre- or corequisite: NURS 512.

**NURS 535 Selected Topics in Community/Public Health Nursing**

★1-12 (variable) (variable, variable). The focus of this course is skills employed in leadership roles in community/public health nursing. Examples include evidence-based practice, cross-cultural issues, policy development and analysis, and intersectoral collaboration and team work. Prerequisite: consent of Instructor.

**NURS 540 Qualitative Methods for Nursing Research**

★3 (fi 6) (either term, 3-0-0). An introduction and overview of qualitative research methods (primarily ethnography, ethno-science and participant observation) and their application for nursing research. Prerequisite: consent of Instructor.

**NURS 541 Research and Clinical Perspectives in Parent and Infant/Child Assessment and Intervention**

★3 (fi 6) (second term, 0-3s-0). This multidisciplinary course will provide research-based knowledge, techniques, tools, and skills in caregiver-infant/child assessment, and reliability in the use of accepted standardized Nursing Child Assessment Satellite Training (NCAST) research/assessment tools (Barnard, 1994).

**NURS 544 Research and Practice in Parent and Infant Assessment and Intervention**

★4 (fi 8) (second term, 0-3s-6c). This multidisciplinary course will provide research-based knowledge, techniques, tools, and skills in caregiver-infant/child assessment, and reliability and practice in the use of accepted standardized Nursing Child Assessment Satellite Training (NCAST) research/assessment tools (Barnard, 1994).

**NURS 545 Pharmacotherapeutics in Advanced Nursing Practice**

★3 (fi 6) (either term, 0-3s-0). Graduate seminar on the principles of clinical pharmacology and their relevance to the promotion of health across the lifespan through advanced nursing practice. The psychotropics will be used as a model for the clinical application of these principles. Focus will be on the selection, prescription, and management of pharmacotherapy as adjunct to advanced nursing practice. Simulated and actual patient situations will be used to stimulate discussion and provide students with an opportunity to apply the basic principles of clinical pharmacology.

**NURS 550 Professional Issues in Advanced Nursing Practice**

★3 (fi 6) (either term, 0-3s-0). Advanced analysis of trends, problems and issues of the nursing profession, with emphasis on interdisciplinary and intersectoral components of the health care system and society. Prerequisite: consent of Instructor.

**NURS 554 Leadership in Health and Nursing Services**

★3 (fi 6) (either term, 0-3s-0). Theoretical concepts and research issues relative to leadership behavior in the health care system will be addressed as a basis for practice in senior position responsible for nursing services. Relevant leadership and administrative topics will be examined, including organization design, health services, integration, information and project management, fiscal accountability, consumer and stakeholder relations, and health policy development. Prerequisite: Undergraduate course in management or consent of Instructor.

**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) (variable, variable). A course designed for in-depth, individual study of a topic related to advanced-level nursing. Learning experiences may include clinical experience.

**NURS 565 Selected Topics in Individual Family Health Nursing (Adult)**

★1-12 (variable) (variable, variable). Selected topics in a variety of advanced nursing practice speciality areas for case management of adults 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. Sections with a practicum component provide opportunities to assist adults and their family within the context of the health care team. Prerequisite: consent of Instructor.

**NURS 567 Selected Topics in Individual Family Health Nursing (Child)**

★1-12 (variable) (variable, variable). Selected topics in a variety of advanced nursing practice speciality areas for case management of infants, children, 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. Sections with a practicum component provide opportunities to assist infants, children, and their family within the context of the health care team. Prerequisite: consent of Instructor.

**NURS 570 Advanced Practice in Individual/Family Health Nursing (Adult)**

★4 (fi 8) (either term, 0-3s-6c). The focus of this course is acquisition of knowledge and skills essential for clinical decision making for management of the individual and their family in various health care situations. Opportunities are provided to implement and evaluate preventative and therapeutic interventions, as well as health promotion strategies. Appropriate community, agency, and treatment resources that may assist in managing emergent to chronic health care situations are utilized. Prerequisite: NURS 510; pre- or corequisite NURS 545.

**NURS 571 Advanced Practice in Individual/Family Health Nursing (Child)**

★4 (fi 8) (either term, 0-3s-6c). The focus of this course is acquisition of the knowledge and skills essential for clinical decision making for the management of infants to children 16 years of age and their families in various health care situations. Opportunities are provided to implement and evaluate preventative and therapeutic interventions, as well as health promotion strategies. Appropriate community, agency, and treatment resources that may assist in managing emergent to chronic health care situations will be utilized. Prerequisite: NURS 513.

**NURS 573 Advanced Practice in Mental Health/Psychiatric Nursing**

★8 (fi 16) (either term, 0-6s-12c). The focus of this course is advanced practice in PMH nursing domains: helping role, diagnostic and monitoring function, administering and monitoring therapeutic interventions, management of rapidly changing situations, teaching-coaching functions, monitoring and ensuring the quality of health care practices, and organizational and work role competencies.

**NURS 580 Advanced Theory and Practicum in Individual/Family Health Nursing (Adult)**

★6 (fi 12) (either term, 0-2s-20c). 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 speciality area. 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 570.

**NURS 581 Advanced Theory and Practicum in Individual/Family Health Nursing (Child)**

★6 (fi 12) (either term, 0-2s-20c). The focus of this course is practice of advanced nursing skills in the student's selected child health speciality area. 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 571.

**NURS 582 Advanced Theory and Practicum in Community/Public Health Nursing**

★6 (fi 12) (either term, 0-2s-20c). The focus of this course is practice of advanced nursing skills in community/public health nursing. Integration of theory and research in relation to practice will be provided to discuss issues relevant to the advanced nursing practice role. Prerequisite: NURS 534.

**NURS 583 Advanced Theory and Practicum in Mental Health/Psychiatric Nursing**

★6 (fi 12) (either term, 0-2s-20c). In this course the student is supervised in assuming an advanced practice role in psychiatric and mental health nursing. Settings for practice may include mental health clinics, outpatient departments, psychiatric practices, specialized treatment programs, health centres, crisis teams. Prerequisite: NURS 573.



**NURS 584 Advanced Theory and Practicum in Management**

★6 (*fi 12*) (either term, 0-2s-20). This practicum is designed to enhance contextual knowledge and skills relevant to leadership roles in the health system. Each student will be matched with a mentor who occupies a senior position in a health policy or delivery organization. Seminars will provide a forum for application of theory. Prerequisite: NURS 554 or equivalent.

**NURS 599 Thesis Seminar**

★1 (*fi 2*) (either term, 0-2s-0). Required for one academic year (two terms) of the Master of Nursing program. Prerequisite: consent of Instructor.

**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 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 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*) (variable, unassigned). A guided scholarly project which will focus on such areas as clinical outcomes, evidence-based practice, quality improvement, or knowledge diffusion.

**201.156 Nutrition, NUTR**

Department of Agricultural, Food and Nutritional Science  
Faculty of Agriculture, Forestry, and Home Economics

**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 Introductory Human Nutrition**

★3 (*fi 6*) (first 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 in any Biochemistry or other Nutrition course.

**[O] NUTR 260 Introductory Animal Nutrition**

★3 (*fi 6*) (first term, 3-0-3). Principles of nutrition. The need for and functions of the major nutrients for animals. Laboratory will involve diet formulation and discussion of feeds and feeding practices. Prerequisite: ★3 in university-level biology or chemistry. Cannot be taken by students with credit in NUTR 301 or equivalent.

**NUTR 301 Energy, Carbohydrates, Lipids and Proteins**

★3 (*fi 6*) (second term, 3-0-3). Fundamentals of nutrition, emphasizing energy, carbohydrates, lipids, and proteins. Students cannot obtain credit in both NUTR 301 and NUTR 303. Prerequisite: ★3 in Biochemistry.

**NUTR 302 Vitamins and Inorganic Elements**

★3 (*fi 6*) (first term, 3-1s-0). Fundamentals of nutrition with emphasis on vitamins and inorganic elements. Prerequisite: ★3 in Biochemistry.

**[O] NUTR 303 Energy, Carbohydrates, Lipids and Proteins**

★3 (*fi 6*) (second term, 3-0-0). Fundamentals of nutrition emphasizing on energy, carbohydrates, lipids, and proteins. Students cannot obtain credit in both NUTR 301 and NUTR 303. Prerequisite: ★3 in Biochemistry.

**[O] NUTR 365 Applied Animal Nutrition**

★3 (*fi 6*) (second term, 3-0-3). Feeds and feeding of swine, poultry, and ruminants. Laboratories will involve feeding projects in applied animal nutrition. Prerequisites: NUTR 260, 301 or 302.

**[O] NUTR 410 Nutritional Toxicology**

★3 (*fi 6*) (first term, 3-0-0). A lecture and reading course in nutritional toxicology. Provides students with understanding of the metabolic consequences of exposure to foodborne chemicals, therapeutic agents, and alcohol. Prerequisite: ★3 in Biochemistry.

**Graduate Courses****Notes**

- (1) NUTR 410 may be taken for credit by graduate students with approval of the student's supervisor or supervisory committee.
- (2) See Agricultural, Food and Nutritional Sciences (AFNS) listing for related courses.

**201.157 Nutrition and Food Sciences, NU FS**

Department of Agricultural, Food and Nutritional Science  
Faculty of Agriculture, Forestry, and Home Economics

**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.

The following table lists renumbered courses effective 1993/94:

Old	New	Old	New
FD SC 100	NU FS 100	FD SC 602	NU FS 650
FD SC 101	NU FS 101	FD NU 225	NU FS 225
FD SC 283	NU FS 283	FD NU 320	NU FS 372
FD SC 353	NU FS 353	FD NU 321	NU FS 374
FD SC 354	NU FS 454	FD NU 323	NU FS 323
FD SC 361	NU FS 361	FD NU 427	NU FS 427
FD SC 363	NU FS 363	FD NU 461	NU FS 461
Old	New	Old	New
FD SC 372	NU FS 372	FD NU 463	NU FS 463
FD SC 400	NU FS 400	FD NU 468	NU FS 468
FD SC 402	NU FS 402	FD NU 472	NU FS 472
FD SC 404	NU FS 404	FD NU 476	NU FS 476
FD SC 405	NU FS 405	FD NU 477	NU FS 477
FD SC 406	NU FS 406	FD NU 478	NU FS 478
FD SC 554	NU FS 554	FD NU 479	NU FS 479
FD SC 573	NU FS 573	FD NU 480	NU FS 480
FD SC 587	NU FS 587	FD NU 481	NU FS 481
FD SC 588	NU FS 588	FD NU 502	NU FS 502
FD SC 601	NU FS 601	FD NU 602	NU FS 602

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] NU FS 100 Introduction to Food Science and Technology**

★3 (*fi 6*) (first term, 3-0-0). An introduction to the nature of food, food technology, food safety. Not open to third- and fourth-year students in the Faculty of Agriculture, Forestry, and Home Economics.

**[O] NU FS 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.

**NU FS 209 Chemistry of Culinary Systems I**

★3 (*fi 6*) (Spring/Summer, variable). Also available in French through the University of Laval (STA-20929). Offered by home study only. Review of basic chemical principles relating to food preparation. Detailed consideration of the chemical behavior of water and proteins in food preparation processes. Additional information may be obtained through the internet at <http://www.afns.ualberta.ca/grstudent/courses/>. Note: Not available to students with credit in NU FS 372.

**NU FS 210 Chemistry of Culinary Systems II**

★3 (*fi 6*) (Spring/Summer, variable). Also available in French through the University

of Laval (STA-20929). Offered by home study only. The chemistry of fats and carbohydrates in food preparation processes. Visual appeal of foods and the role of pigments in cuisine. Prerequisites: NU FS 209. More information available through the internet at <http://www.afns.ualberta.ca/grstudent/courses/>. Note: Not available to students with credit in NU FS 372.

#### **NU FS 283 Introduction to Food Engineering**

★3 (fi 6) (second term, 3-0-3). Mass and heat balances, thermodynamics. Fluid mechanics, heat and mass transfer in food systems. Prerequisites: MATH 113 or 114 and ★6 of chemistry or physics, or consent of Instructor.

#### **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 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: Introductory Statistics.

#### **NU FS 323 Trends and Traditions Influencing Dietary Patterns**

★3 (fi 6) (second term, 3-0-3). Food habits as influenced by historical, geographical, religious, cultural, and economic factors. Implications of these on food selection, menu planning, food purchasing, preparation, and intake. Corequisite: NU FS 374 or prerequisite: ★60 including a ★3 NUTR or NU FS course.

#### **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.

#### **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: BIOL 107 or 108 or ★3 in Microbiology.

#### **NU FS 363 Food Microbiology**

★3 (fi 6) (first 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) (first term, 3-0-3). Chemistry of food constituents. Laboratory emphasizes analytical techniques. Given concurrently with NU FS 373. Not open to students with credit in NU FS 373. Prerequisites: CHEM 161 and 163.

#### **NU FS 373 Food Chemistry**

★3 (fi 6) (either term, 3-0-0). Chemistry of food constituents. Prerequisite: CHEM 161/163. Given concurrently with NU FS 372. Not open to students with credit in NU FS 372.

#### **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 393 Dairy Product Analysis**

★3 (fi 6) (second term, 1-0-3). Biochemical, chemical, and microbiological analyses of milk and dairy products. Prerequisites: NU FS 300, 361, and 372, or DAIRY 300. Credit cannot be obtained for NU FS 393 and DAIRY 393.

#### **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.

#### **NU FS 401 Undergraduate Research Project**

★3 (fi 6) (variable, 0-0-6). Directed laboratory study under supervision 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 that topic is different.

#### **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. Offered in alternate years. Prerequisites: MICRB 265 or NU FS 361 or 363.

#### **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. Prerequisite: NU FS 300 or DAIRY 300. Credit cannot be obtained for NU FS 403 and DAIRY 403.

#### **NU FS 404 Meat and Meat Products**

★3 (fi 6) (second term, 3-0-3/2). Biological, biochemical, chemical, and technological aspects of the processing of meat and meat products. Prerequisite: ★3 in Biochemistry.

#### **NU FS 405 Postharvest Physiology and Processing of Fruits and Vegetables**

★3 (fi 6) (first term, 3-0-3/2). Physiological, biochemical, and biophysical changes associated with maturation, ripening, and senescence of fruits and vegetables. Design, selection, and utilization of handling, storage, and transport facilities. Biological, biochemical, chemical, and technological aspects of processing. Offered in alternate years. Prerequisite: ★3 in introductory Biochemistry. Note: Students with credit in PL SC 324 must obtain permission from Instructor.

#### **NU FS 406 Processing and Storage of Cereals and Oilseeds**

★3 (fi 6) (first term, 3-0-3/2). Biological, biochemical, chemical, and technological aspects of the processing of cereals and oilseeds. Offered in alternate years. Prerequisite: ★3 in introductory Biochemistry.

#### **NU FS 427 Food Safety**

★3 (fi 6) (first term, 3-1.5s-0). Safety of the North American food supply. Principles of risk: benefit evaluations related to chemical and microbiological issues about foods. The course will emphasize current issues and perceptions relating to foods and nutrition which influence consumer acceptance of foods. Prerequisites: NU FS 361 (or 363) and 372 (or 373).

#### **NU FS 430 Principles of Sensory Evaluation of Foods**

★3 (fi 6) (either 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 431 Fundamentals of Product Development**

★3 (fi 6) (either term, 3-0-0). Conversion of ingredients into formulated food products for large scale industrial and institutional production. Prerequisite: NU FS 372 or 373.

#### **NU FS 440 Dairy Science and Nutrition**

★3 (fi 6) (either term, 0-3s-0). Integrated final project including laboratory or field work. Exploration of dairy systems, technological processes or issues pertaining to quality and nutritive value of dairy products. Open to fourth-year students only. Prerequisite: consent of Instructor. Credit cannot be obtained for NU FS 440 and DAIRY 440.

#### **NU FS 452 Nutritional Aspects of Chronic Human Diseases**

★3 (fi 6) (second term, 3-0-0). A lecture and reading course for senior undergraduate students which will address the scientific basis for nutritional intervention in chronic human disease. Prerequisites: NUTR 301 (or 303) and 302 (or 304), or consent of Instructor.

#### **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. Prerequisites: NU FS 283, NU FS 361 (or 363) and 372 (or 373), or consent of Instructor.

#### **NU FS 461 Foodservice Systems Management**

★3 (fi 6) (first term, 3-0-4). 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. Prerequisites: NU FS 374 and 323.

#### **NU FS 463 Foodservice Facilities: Planning and Design**

★3 (fi 6) (second term, 3-0-0). The systems approach in planning foodservice facilities. The interrelationship between the scientific approach, the management approach, and quantity food production technique in planning and designing food service systems. Prerequisite: NU FS 461.

#### **NU FS 468 Clinical Dietetics**

★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. Prerequisite: NUTR 301 (or 303). Corequisite: NUTR 302.

#### **NU FS 472 Coordinated Practical Program**

★3 (fi 6) (either term, 0-1s-8). Supervised practical experience in selected areas of interest. For senior Foods and Nutrition majors with consent of Instructor.

#### **NU FS 476 Advanced Clinical Dietetics**

★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. Prerequisite: NU FS 468.

#### **NU FS 477 Nutrition in the Community**

★3 (fi 6) (second term, 3-0-3). Examination of nutrition problems in contemporary communities. The application of basic concepts of food and nutrition to community nutrition problems. Discussion of nutrition programs and resources. Prerequisites: NUTR 301 (or 303) and NUTR 302 (or 304). Preference given to BSc NU FS students.

#### **NU FS 478 Advanced Nutrition: Energy, Carbohydrates, Lipids, and Proteins**

★3 (fi 6) (either 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. Prerequisite: NUTR 301 (or 303). NUTR 302 (or 304) is recommended.

#### **NU FS 479 Advanced Nutrition: Vitamins and Inorganic Elements**

★3 (fi 6) (second 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. Prerequisite: NUTR 302 (or 304). NUTR 301 (or 303) is recommended.

#### **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. Offered in alternate years. Prerequisite: MICRB 265 or NU FS 361 or 363.

#### **NU FS 481 Advanced Foods**

★3 (fi 6) (first term, 3-0-0). Quality characteristics of foods. Current scientific information about foods used in the home and institutions with emphasis on quality factors such as color, texture, and flavor. Prerequisites: NU FS 374 and ★3 in Biochemistry or consent of Instructor.

#### **NU FS 502 Coordinated Practical Program**

★3 (fi 6) (second term, 0-1s-8). Supervised practical experience in selected areas of interest. Note: For senior Foods and Nutrition majors.

## Graduate Courses

### Notes

- (1) The following undergraduate courses may be taken for credit by graduate students with approval of the student's supervisor or supervisory committee. NU FS 402, 403, 404, 405, 406, 427, 430, 431, 440, 454, 480.
- (2) See also Agricultural, Food and Nutritional Science (AFNS) listing for related courses.

## 201.158 Obstetrics and Gynaecology, OB GY

Department of Obstetrics and Gynecology  
Faculty of Medicine and Dentistry

### Undergraduate Courses

#### **OB GY 431 Obstetrics and Gynaecology**

★3 (fi 6) (first term, 85 hours). An introduction to obstetrics and gynaecology, including some topics in human sexuality. For third year medical students only.

#### **OB GY 446 Student Internship**

★6 (fi 12) (two term, 8 weeks). Student internship for students in Phase III, MD program only.

### Course Beginning in 2000-2001

#### **OB GY 546 Obstetrics and Gynaecology Student Internship**

★8 (fi 16) (either term, 8 weeks). Student internship in Obstetrics and Gynaecology for students registered in the MD program.

## 201.159 Occupational Therapy, OCCTH

Department of Occupational Therapy  
Faculty of Rehabilitation Medicine

**Note:** All OCCTH courses are open to OT students only except OCCTH 106 and 107 which are open to all students.

### Undergraduate Courses

#### **OCCTH 106 Communication Theory and Helping Relationship**

★3 (fi 6) (either term, 3-0-0). Interpersonal communication theory and application to health care. Exploration of values and attitudes as they affect professional/client relationships.

#### **OCCTH 107 Models, Approaches, and Service Delivery**

★3 (fi 6) (either term, 3-0-0). Fundamental concepts of occupational therapy and their application in health care delivery. Implications of legal, educational, and governmental influences on service models.

#### **OCCTH 209 Therapeutic Occupation**

★3 (fi 6) (two term, 0-3L-0). Lectures in the therapeutic use of activity. Practical experience in selected activities suitable for use as therapeutic media, with emphasis on task analysis. Demonstrations of adaptive equipment and techniques. Corequisite: OCCTH 211. A single-term course taught over a two-term period.

#### **OCCTH 211 Assessment and Evaluation Techniques**

★3 (fi 6) (two term, 0-3L-0). Theory and practical classes in evaluation, assessment, and treatment techniques. Corequisites: OCCTH 209, 333, 334, REHAB 282, 283. A single-term course taught over a two-term period.

#### **OCCTH 308 Psychosocial Assessment and Rehabilitation in Occupational Therapy**

★6 (fi 12) (either term, 5-0-1). Introduction to the assessment of clinical disorders in psychiatry and psychosocial issues. Taught from a lifespan approach through case studies, it links clinical disorders and psychosocial issues related to assessment and intervention with individuals in the practice of occupational therapy. Prerequisites: OCCTH 106, 107.

#### **OCCTH 312 Introduction to Assistive Technology**

★3 (fi 6) (either term, 1-0-2). Discusses the role of the occupational therapist within a multidisciplinary service system. This includes an introduction to accessible architectural design, computer applications environmental controls, light/daily living technologies, and wheeled mobility equipment.

#### **OCCTH 313 Orthotics**

★3 (fi 6) (either term, 1-0-2). Lectures and practical classes in the principles of design and methods of fabrication of orthotic devices. Prerequisite: OCCTH 211.

#### **OCCTH 328 Fieldwork**

★3 (fi 6) (either term, 6 weeks). Credit. Practical experience in approved facilities and community agencies. Prerequisites: consent of Department and attendance at Orientation Program and Professional Development Seminar.

#### **OCCTH 333 Medicine and Surgery**

★3 (fi 6) (either term, 3-0-0). A study of histopathology and disease processes encountered in the practice of occupational therapy, medical and surgical conditions, and their treatment. Prerequisites: OCCTH 211, REHAB 282, 283.

#### **OCCTH 334 Orthopedics**

★4 (fi 8) (either term, 5-0-0). A study of tissue biomechanics in normal and selected pathological conditions and the etiologies, medical and occupational therapy assessment and intervention of orthopedic disorders. Prerequisites: REHAB 282, 283. Corequisite: OCCTH 211.

#### **OCCTH 403 Occupational Therapy, Theory and Practice in Neurology**

★3 (fi 6) (either term, 0-3L-0). Occupational Therapy principles, patient evaluation, and treatment procedures in a variety of neurological conditions. Prerequisites: REHAB 351, 353.

#### **OCCTH 404 Group Dynamics and Community Leadership**

★3 (fi 6) (either term, 0-3s-0). Principles of group therapy in rehabilitation as related to the practice of Occupational Therapy specifically aimed at social and community issues. Prerequisite: OCCTH 308.

#### **OCCTH 407 Sexuality in Rehabilitation Workshop**

★1 (fi 2) (either term, 20 hours). Sexuality as related to the practice of Occupational Therapy. Prerequisite: OCCTH 308. Corequisite: OCCTH 404.

#### **OCCTH 408 Occupational Therapy Theory**

★3 (fi 6) (either term, 0-3s-0). Selected conceptual models of occupational therapy are examined in terms of their philosophical base, conceptualization, and application to practice. Open only to post-diploma degree completion students unless department consent is granted.

#### **OCCTH 413 Special Fieldwork**

★3 (fi 6) (either term, 0-3s-3c). A course designed to allow undergraduates to pursue the practical application of occupational therapy techniques in a specialized setting. These settings depend on the student's stated objectives for pursuing an area of interest, as well as the consent of the agency where the fieldwork is to be done. Enrolment is limited. Prerequisite: consent of Department after completion of OCCTH 328. Note: May not be used for credit as an elective or to replace OCCTH 328, 428, 431, 432. This course is extra to the requirements for the BScOT degree.

#### **OCCTH 425 Normal and Abnormal Child Function and Intervention**

★6 (fi 12) (either term, 0-6L-0). The study of normal and abnormal physical, psychological, social, and intellectual development from birth to adolescence with emphasis on assessment and remedial programming in an occupational therapy context. Prerequisite: REHAB 351.

#### **OCCTH 428 Fieldwork**

★3 (fi 6) (either term, 7 weeks). Credit. Practical experience in approved facilities and community agencies. Prerequisites: consent of Department, attendance at Professional Development Seminar and completion of OCCTH 328.

**OCCTH 431 Fieldwork**

★4.5 (*fi 9*) (either term, 7 weeks). Credit. Practical experience in approved facilities and community agencies. Prerequisites: consent of Department and completion of OCCTH 428.

**OCCTH 432 Fieldwork**

★4.5 (*fi 9*) (either term, 7 weeks). Credit. Practical experience in approved facilities and community agencies. Prerequisites: consent of Department, completion of OCCTH 431 and completion of all course work.

**OCCTH 435 Advanced Psychosocial Rehabilitation**

★3 (*fi 6*) (either term, 1-2s-0). A review of psychosocial factors influencing occupational performance. Psychiatric and psychosocial disorders, their diagnosis, classification, and treatment, with specific emphasis on the role of the occupational therapist in assessment, intervention, and consultation. Particular emphasis on case management and counselling strategies as they apply to psychosocial rehabilitation. Prerequisite: OCCTH 308.

**OCCTH 455 Administrative and Evaluation Issues in Rehabilitation**

★3 (*fi 6*) (either term, 3-0-0). Interactive sessions concerning the current leadership practices and administrative strategies being utilized within the Canadian service delivery system. Students will acquire the knowledge and skills required to plan, develop, and evaluate occupational therapy services in a variety of settings. Prerequisite: consent of Department.

**OCCTH 456 Occupational Therapy in Work**

★3 (*fi 6*) (either term, 3-0-0). Current developments and OT practice in physical rehabilitation, in particular work assessment and task analysis.

**OCCTH 498 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.

**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 505 Instrumentation and Theory in Occupational Therapy**

★3 (*fi 6*) (either term, 0-3s-0). Measurement principles and their application to occupational therapy. Overview of measurement techniques used by therapists. Prerequisite or corequisite: EDPY 501 or equivalent.

**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 535 Psychosocial Aspects of Rehabilitation**

★3 (*fi 6*) (either term, 0-3s-0). Discussion of psychological factors affecting physical and psychiatric rehabilitation, and implications for program planning. Prerequisite: OCCTH 532 or consent of Department.

**OCCTH 538 Counselling in Rehabilitation**

★3 (*fi 6*) (either term, 0-3s-0). Discussions on specific issues related to counselling handicapped persons. Opportunity to practice and apply communication and counselling skills. Prerequisite: OCCTH 532 or consent of Department.

**OCCTH 570 Evaluation of Occupational Performance**

★3 (*fi 6*) (either term, 0-3s-3). Presentation of resources and techniques necessary for work evaluation, work adjustment and work samples used in rehabilitation.

**OCCTH 596 Project Design**

★3 (*fi 6*) (either term, 0-1s-2). Preparation of directed research project. Open to students in the course-based Master's route only.

**OCCTH 597 Research and Directed Studies**

★3 (*fi 6*) (either term, 0-0-3). Work on a specific project under the supervision of a faculty member. Prior approval of the supervisor and the student's advisor required.

**OCCTH 599 Directed 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 Research Project**

★6 (*fi 12*) (variable, unassigned).

**201.160 Oncology, ONCOL**

Department of Oncology  
Faculty of Medicine and Dentistry

**Undergraduate Courses****ONCOL 431 Topics in Oncology**

★1 (*fi 2*) (two term, 24 hours). For third-year medical students only.

**Graduate Courses**

**Note:** See also PMCOL 505 (Cancer Chemotherapy), MED 573 (Directed Reading in Experimental Hematology), PHYS 475 (Medical Radiation Physics-Fundamentals) and PHYS 477 (Medical Radiation Physics-Radiotherapy Applications).

**ONCOL 501 The Principles of Palliative Care**

★3 (*fi 6*) (second term, 3-0-0). An introduction to the principles of palliative care. Topics to be addressed include the spectrum of terminal illness, hospice care versus palliative care, ethical and philosophical aspects of palliative care, the epidemiology, physical aspects and emotional mechanisms (coping) associated with terminal illness, the dichotomy between palliative care and euthanasia or assisted suicide, the spiritual, cultural, social, legal, and financial aspects of death and dying, the impact of differing health care systems on the delivery of palliative care with examples drawn from Canada, North America, Europe, and developing countries, multi-disciplinary approaches to palliative care, and the roles of the patient, family and other care-givers in palliative care. Prerequisite: consent of Department.

**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. 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, children with cancer, cancer and its impact on the family, grief and loss 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; and a brief overview of therapeutic stratagems. Course offered in alternate years. Prerequisites: BIOCH 203 and 205 or equivalent.

**ONCOL 530 Cellular Responses to DNA-damaging Agents**

★3 (*fi 6*) (second term, 3-0-0). A lecture course that will provide an introduction to the current concepts of cellular responses to DNA-damaging agents, both naturally occurring and human-made. This course will provide an overview of the types of DNA damage that are induced by various physical and chemical carcinogens, and the signal transduction pathways activated in response to DNA damage. Topics to be covered include cell cycle arrest, DNA repair, and apoptosis. An overview of how this knowledge can be applied for improved radio- and chemotherapeutic management of cancer patients will be presented. Note: Course offered in alternate years. Prerequisites: BIOCH 203 and 205 or equivalent

**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 Radiation Therapy Physics**

★2 (*fi 4*) (either term, 2-0-0). The course will provide an introduction to fundamental radiation physics and its clinical application to the treatment of cancer. Topics include radioactivity, x-ray production, interactions of ionizing radiation with matter, radiation dosimetry, and external beam therapy machine technology. Prerequisite: consent of the Department.

**ONCOL 552 Fundamentals of Radiation Dosimetry**

★2 (*fi 4*) (either term, 2-0-0). This course covers the theory and fundamental techniques for teletherapy and brachytherapy. Topics include dose distributions and scatter analysis for single and multiple photon beams, photon beam shaping, dose distributions for electron beams, radiotherapy of particle beams, dosimetry of small sealed sources (brachytherapy), dosimetry for unsealed sources, and applied radiation protection. Prerequisite: ONCOL 550.

**ONCOL 554 Radiation Treatment Planning**

★2 (*fi 4*) (either term, 0-1s-1). This course will give the student practical experience

in radiation treatment planning. The student will be required to plan radiation treatments using manual and computerized techniques for specific tumor sites. Topics include achieving uniform tumor dose while avoiding critical structures; the use of compensator devices, wedges, single and multiple beams, and rotation therapy; electron therapy; brachytherapy treatments. Prerequisite: ONCOL 552.

#### 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 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 660 Current Topics in Cancer Research

★2 (fi 4) (two term, 0-1s-0). A general seminar 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) Active participation is required of all graduate students in the Division of Experimental Oncology with a view toward developing their critical appraisal abilities. (2) Students will present one seminar each year either on results of their own research or on a related topic approved by their research advisor.

## 201.161 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; paediatric 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 three years so that three consecutive enrolments are possible. Prerequisite: consent of Department.

## 201.162 Oral Biology, OBIOL

Department of Oral Health Sciences  
Faculty of Medicine and Dentistry

### Undergraduate Courses

#### OBIOL 202 Oral Biology I

★4 (fi 8) (two term, 60 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.

#### OBIOL 300 Introduction to Pharmacology

★2 (fi 4) (two 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.

#### 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) (first 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.

#### OBIOL 454 Dental Therapeutics

★1 (fi 2) (either term, 15 hours). Lectures will be presented on the following topics: pharmacology and therapeutics, prescription writing, drug schedules and interactions, cardiovascular, geriatric, hemostasis and nutritional considerations, desensitizing agents, sterilization and disinfection, and other agents used in practice.

#### OBIOL 456 Correlated Science Seminars

★1 (fi 2) (second term, 15 hours). Seminars will include prophylaxis, gingivitis, periodontitis, local anaesthesia, endodontics, orthodontics, extractions, TMJ, operative dentistry, removable prosthodontics and fixed prosthodontics.

#### OBIOL 497 Independent Study

★3 (fi 6) (two term, 55 hours). An advanced independent study program defined by the student with the parameters of Faculty approved guidelines. The purpose of the course is to encourage the student to develop an interest in and appreciation for research, to gain skills in supporting opinions and observations by use of the scientific method and to present the results of the study to colleagues and to the public.

### 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. (For graduate students in Orthodontics.)

#### OBIOL 501 Oral Biology II

★3 (fi 6) (second term, 3-0-0). A continuation of Oral Biology I. Growth and development of skull. Anthropology. Selected topics in physiology.

#### 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 include the major areas of research in the Department of Oral Biology. Students will present one seminar.

#### 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 Dentistry by consent of the Chair, Department of Oral Biology.

#### 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).

## 201.163 Organizational Analysis, ORG A

Department of Organizational Analysis  
Faculty of Business

**Note:** Enrolment in all ORG A 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.

The following table lists courses renumbered effective 1997/98:

Old	New	Old	New
BUS 424	ORG A 431	ORG T 404	ORG A 403
HRM 301	ORG A 311	ORG T 405	ORG A 404
HRM 402	ORG A 412	ORG T 412	ORG A 429
HRM 403	ORG A 413	ORG T 413	ORG A 407
HRM 422	ORG A 414	ORG T 414	ORG A 433
HRM 423	ORG A 415	ORG T 415	ORG A 436
HRM 424	ORG A 416	ORG T 403	ORG A 402
HRM 443	ORG A 417	ORG T 421	ORG A 434
HRM 496	ORG A 418	ORG T 432	ORG A 405
ORG T 301	ORG A 301	ORG T 444	ORG A 435
ORG T 311	ORG A 321	ORG T 492	ORG A 432

ORG T 402      ORG A 409      ORG T 495      ORG A 495

## Undergraduate Courses

**Note:** The following course, normally offered in Spring/Summer is available to students in other faculties. It is not available for credit in the BCom or in Business Minor programs.

### ORG A 101 Introduction to Management for Non-Business Students

★3 (fi 6) (either term, 3-0-0). This course provides an understanding of the behaviour of individuals and groups within the context of the business organization. Covers topics such as organizational structure, culture, individual differences, personality, motivation, leadership, groups, decision making, power, politics, conflict, careers, stress, and organizational change.

### ORG A 201 Introduction to Management

★3 (fi 6) (either term, 3-0-0). Introduces students to the behavioral, political and organizational dynamics of managerial practice. Reviews how managers make decisions on corporate and competitive strategy. Topics include power, decision making, motivation, leadership, and team management.

### ORG A 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.

### ORG A 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: Open to third- and fourth-year students.

### ORG A 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: Open to third- and fourth-year students.

### ORG A 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: Open to third- and fourth-year students.

### ORG A 403 Organizational Leadership Concepts

★3 (fi 6) (either term, 3-0-0). This is a seminar course in applied behavioral science that emphasizes the indepth analysis of leadership. The purpose of the course is to increase our effectiveness and skill in understanding leadership in organizations, analyzing leadership and to become better leaders in organizations. To accomplish this objective, we will use leadership theories and concepts as tools to understand the leadership and leadership thinking of great leaders/ leadership thinkers form the past. Some representative examples from history are Sun Tzu, Machiavelli, Winston Churchill, Mahatma Gandhi, Themistocles, Aristotle and Cleopatra. Classes will be a mix of small group and large group discussion, lecture, and student group discussion.

### ORG A 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: Open to third- and fourth-year students.

### ORG A 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: Open to third- and fourth-year students.

### ORG A 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: Open to third- and fourth-year students.

### ORG A 409 Advanced Seminar: Behavior in Organizations

★3 (fi 6) (either term, 3-0-0). Individual instructors will cover topics in the field of organization behavior that relate to their particular research interests. Prerequisite: ORG A 301.

### ORG A 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.

### ORG A 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: Open to third- and fourth-year students.

### ORG A 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: Open to third- and fourth-year students.

### ORG A 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. Prerequisite: Open to third- and fourth-year students.

### ORG A 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. Prerequisite: Open to third- and fourth-year students.

### ORG A 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. Prerequisite: Open to third- and fourth-year students.

### ORG A 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: Open to third- and fourth-year students.

### ORG A 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: Open to third- and fourth-year students.

### ORG A 419 Human Resource Management for Small Business

★3 (fi 6) (either term, 3-0-0). This course will cover issues relevant to managing human resources in a small business, a family owned enterprise, or an entrepreneurial firm, or organizations that typically are smaller, growing companies at the early stages of their life cycle. These firms are unique in that they embrace innovations and change and often lack the support systems available in larger organizations. Consequently, the entrepreneur/owner typically will perform all of the human resource functions him/herself. This course will provide the information that small business owners must have in order to manage and grow a business. Prerequisite: Open to third- and fourth-year students.

### ORG A 422 Critical Review of Management Thought

★3 (fi 6) (either term, 3-0-0). This course reviews the thinking of management theorists from classical management onward, examining the context of their ideas and, where relevant, how these have been taken up and adapted. Contemporary issues and ideas in management would also be examined in a critical fashion.

### ORG A 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.

**ORG A 429 Advanced Seminar: Organization Theory**

★3 (fi 6) (either term, 3-0-0). Individual instructors will cover topics in the field of organization theory that relate to their particular research interests. Prerequisite: ORG A 201 or ORG A 321.

**ORG A 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: Open to third- and fourth-year students.

**ORG A 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.

**ORG A 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: Open to third- and fourth-year students.

**ORG A 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: Open to third- and fourth-year students.

**ORG A 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: Open to third- and fourth-year students.

**ORG A 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: Open to third- and fourth-year students.

**ORG A 436 Management and the Natural Environment**

★3 (fi 6) (either term, 3-0-0). This course is an introduction to global environment issues and their impact on managers and organizations. It explores the key issues of the day including atmospheric issues, biodiversity, hazardous waste, and energy consumption. It also explores solution spaces including the concept of sustainable development, economic instruments, regulatory systems, full cost accounting, and international governance. Prerequisite: Open to third- and fourth-year students.

**ORG A 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: Open to third- and fourth-year students.

**ORG A 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.

**ORG A 441 Business Strategy**

★3 (fi 6) (either term, 1.5-1.5s-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 ORG A 201.

**ORG A 488 Selected Topics in Organization Theory**

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

**ORG A 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.

**ORG A 496 Individual Research Project II**

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

**ORG A 497 Individual Research Project III**

★3 (fi 6) (either term, 3-0-0). Special Study for advanced undergraduates. Prerequisites: ORG A 496, consent of the Instructor and Assistant Dean, Undergraduate Program.

**Graduate Courses****ORG A 501 Organization Strategy**

★1.5 (fi 3) (either term, 18 hours). 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. reengineering, the learning organization, virtual organizations) are critically reviewed. Offered in a six-week period.

**ORG A 503 Strategic Human Resource Management**

★1.5 (fi 3) (either term, 18 hours). This Human Resource Management course looks at options relevant to staffing, performance management, reward systems, and labor relations in relation to organizational strategy. It addresses current issues such as workforce diversity, worker empowerment, incentive schemes, and labor-management partnerships. Offered in a six-week period.

**ORG A 504 Elements of Organizations**

★1.5 (fi 3) (either term, 18 hours). This course examines research on human behavior in organizations as it applies to individual motivation and to organizational effectiveness. It provides a framework for senior executives and supervisors alike for designing and implementing an organization's human resource management systems. Topics include job design, team management, delegation, decision making, goal setting, performance measurement, performance appraisal, communication, and conflict management. Offered in a six-week period.

**ORG A 543 Business Ethics**

★1.5 (fi 3) (either term, 18 hours). This course will address ethical aspects of business situations and relationships. It will be emphasized that virtually all business decisions have significant ethical content.

**ORG A 560 New Ventures Management**

★1.5 (fi 3) (either term, 18 hours). This course will address problems commonly associated with the commercialization of knowledge-based Research and Development.

**ORG A 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.

**ORG A 611 Current Issues in Human Resource Management**

★3 (fi 6) (either term, 3-0-0). This course is relevant to managers who want to learn about current critical issues and the questions with which they will have to deal in designing HRM systems in the 1990s and beyond.

**ORG A 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.

**ORG A 616 Performance Management and Rewards**

★3 (fi 6) (either term, 3-0-0). This Human Resource Management course focuses on how organizations design and manage 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.

**ORG A 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.

**ORG A 618 Public Sector Employee Relations**

★3 (fi 6) (either term, 3-0-0). This Human Resource Management course examines the role and functions in public sector employee relations 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.

**ORG A 619 Power and Organization**

★3 (fi 6) (either term, 3-0-0). This course introduces students to aspects of organizational life often omitted in business courses—the roles of humor, gossip, emotion and sex; the organization of time and space; the construction of the body and organizational identities—and considers their significance for understanding contemporary organizational practices.

**ORG A 624 Critical Review of Management Ideas**

★3 (fi 6) (either term, 3-0-0). Reviews the evolution of management thought. Particular attention is given to examination of contemporary ideas such as reengineering, virtual organizations and total quality management. Examines how these ideas affect managerial practice and the extent to which there is substance behind the rhetoric.

**ORG A 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.

**ORG A 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.

**ORG A 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.

**ORG A 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.

**ORG A 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.

**ORG A 636 Management and the Natural Environment**

★3 (fi 6) (either term, 3-0-0). This course is an introduction to the global environment crisis and its impact on managers and organizations. It explores the key issues of the day, including atmospheric issues, biodiversity, hazardous waste, and energy consumption. It also explores solution spaces including the concept of sustainable development, economic instruments, regulatory systems, full cost accounting, and international governance.

**ORG A 637 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.

**ORG A 638 Strategic Management of Technology and Innovation**

★3 (fi 6) (either term, 3-0-0). This advanced course helps the student to understand the management of new product or production process development and change in existing products or processes in firms and industries. Major issues discussed are: 1) competitiveness and technology assessment in managing the introduction of new product or process technology; 2) diffusion of innovations among firms and the technological evolution of industries; and 3) strategies of how to manage technological innovation within the firm.

**ORG A 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.

**ORG A 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.

**ORG A 642 Business Policy**

★3 (fi 6) (either term, 3-0-0). This course is concerned with the social, economic, political and cultural environment in which businesses operate in Canada. It centres on the major projects and set of interrelationships among business, government, other groups, and the Canadian public. Topics will vary from year to year.

**ORG A 643 Managing Public, Not-for-Profit and Voluntary Organizations**

★3 (fi 6) (either term, 3-0-0). This course will examine the context and nature of managerial behavior and activity in the non-profit, especially government, sector. The focus will be on the implementation rather than the formation of policies and programs. Public and private sector managerial practices will be compared.

**ORG A 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.

**ORG A 653 Leadership Concepts in Organizational Settings**

★3 (fi 6) (either term, 3-0-0). This seminar provides an in-depth understanding of issues and practices related to leadership in organizations. Classes will be a mix of small group discussion, group activities, large group discussion, and lecture.

**ORG A 654 Research Methods in Organization Science**

★3 (fi 6) (either term, 3-0-0). This course is concerned with the nature and process of research in the organization sciences. It is designed for the student who wishes to know more about how research is done and about the meaning of research findings in organization science. This course should be of special interest to students who are contemplating a career in teaching and research. Topics covered include: role and development of theory in research; steps and problems in the design of a research project; problems of measurement; appropriate methods of data analysis; and interpretation of results. The emphasis is on the logic of the research process rather than the mechanics of specific procedures, on survey research and field methods rather than laboratory research. Not open to students who have completed BUS 654.

**ORG A 655 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.

**ORG A 656 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.

**ORG A 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.

**ORG A 672 New Ventures Management**

★3 (fi 6) (either term, 3-0-0). Prerequisite: Completion of the first year of the MBA or MPM program.

**ORG A 686 Selected Topics in Behavioral Sciences**

★3 (fi 6) (either term, 3-0-0).

**ORG A 701 Seminar in Organization Theory**

★3 (fi 6) (either term, 3-0-0).

**ORG A 702 Seminar in Human Behavior in Organization**

★3 (fi 6) (either term, 3-0-0). A review of pertinent theories and especially research findings that relate to motivation, social influences processes, organizational roles, leadership, and inter- and intra-group dynamics. Issues of job design, conflict resolution, communications processes and problem solving are covered. Where applicable, personality variables are included. This seminar attempts to develop insights into the social psychology of human behavior as it occurs within the boundaries of complex organizations.

**ORG A 703 Seminar in Strategic Management**

★3 (fi 6) (either term, 3-0-0).

**ORG A 704 Individual Research**

★3 (fi 6) (either term, 3-0-0).

**ORG A 705 Seminar in Contemporary Issues**

★3 (fi 6) (two term, 3-0-0).



**ORG A 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.

**ORG A 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.

**ORG A 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.

**ORG A 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.

**ORG A 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.

**201.164 Paediatrics, PAED**

Department of Paediatrics  
Faculty of Medicine and Dentistry

**Undergraduate Courses****PAED 431 Topics in Medical Genetics**

★1 (*fi 2*) (two term, 22 hours). For third-year medical students only.

**PAED 446 Student Internship**

★6 (*fi 12*) (two term, 8 weeks). Student internship for students in Phase III only.

**Graduate Courses****PAED 501 Pathophysiology of Newborn Diseases**

★4 (*fi 8*) (either term, 78 hours). Basic and clinical lectures on basic pulmonary physiology, respiratory diseases of newborns, assisted ventilation, jaundice, birth asphyxia, cardiac problems, thermal control, fluid and electrolyte balance, resuscitation of newborn, hematologic problems, sepsis, drug use and surgical problems in the newborn. Prerequisites: PAED 446, NURS 453, or consent of Department.

**Courses Beginning in 2000-2001****PAED 546 Paediatrics Student Internship**

★8 (*fi 16*) (either term, 8 weeks). Student internship in Paediatrics for students registered in the MD program.

**201.165 Paleontology, PALEO**

Departments of Biological Sciences and Earth and Atmospheric Sciences  
Faculty of Science

The following course was renumbered effective 1997/98:

<b>New</b>	<b>Old</b>
PALEO 314	PALEO 414

**Undergraduate Courses****PALEO 318 Paleobiology of the Lower Vertebrates**

★3 (*fi 6*) (first term, 3-0-3). Evolution of fish-like vertebrates, amphibians, reptiles and birds, with emphasis on systematics, major adaptive shifts and subsequent evolutionary radiation. Prerequisite: EAS 230 or ZOOL 225 or ZOOL 200.

**PALEO 319 Paleobiology of the Higher Vertebrates**

★3 (*fi 6*) (second term, 3-0-3). The Mesozoic history of mammals as illustrative of the origin and evolution of a higher taxon; adaptive radiation of Tertiary mammals, with special emphasis on insectivores, primates, carnivores, proboscians, and ungulates. Prerequisite: EAS 230 or ZOOL 225 or ZOOL 200.

**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. Not available to students with credit in PALEO 314.

**Graduate Courses**

**Note:** The following undergraduate courses may be taken for credit by graduate students: PALEO 318, 319.

**PALEO 512 Selected Topics in Paleontology**

★3 (*fi 6*) (either term, 4-2s-0). Offered in alternate years.

**PALEO 520 Problems in Vertebrate Paleobiology**

★3 (*fi 6*) (either term, 0-1s-0). Prerequisites: PALEO 318 and 319.

**201.166 Pathology, PATH**

Department of Laboratory Medicine and Pathology  
Faculty of Medicine and Dentistry

**Notes**

- (1) PATH 501 and 502 are intended for residents in pathology, medical microbiology, surgery, or medicine. There are currently no other graduate courses available on human diagnostic pathology. PATH 506 and 507 are intended for residents in pathology, medical microbiology, surgery or medicine, and graduate students from the medical laboratory science program. There are currently no other graduate courses available on medical biochemistry.
- (2) Not all graduate courses are offered every year. The Department should be consulted regarding the availability of graduate courses in any academic session.

**Graduate Courses****PATH 501 Cellular and Tissue Structure and General Mechanisms of Disease**

★6 (*fi 12*) (two term, 78 hours). Advanced seminars on the Cell Cycle; Instrumentation and Techniques of Electron Microscopy; Pathobiology of Lysosomes, Mitochondria and Endoplasmic Reticulum; Humoral and Cellular Mechanisms in Immunology; Hypersensitivity; Autoimmune Diseases; Immunology of Cancer; Immunodeficiency Diseases; Transplantation Immunity; Evaluation of Renal Function; Glomerular Disease; Renal Vascular Diseases; Renal Transplantation; Renal Tumours; Hormonal Mammary Dysplasia; Mammary Tumours; Liver Function Tests; Viral Hepatitis; Cholestasis; Alcoholic Liver Disease; Acute and Chronic Hepatitis; Neoplasms of Liver; Fetal and Neonatal Pathology; Diseases of the Placenta. To be offered in alternate years. Restricted to Postgraduate Medical Education students or consent of Department.

**PATH 502 Cellular and Tissue Structure and General Mechanisms of Disease**

★6 (*fi 12*) (two term, 78 hours). Advanced seminars on Collagen Structure and Function; Blood Coagulation; Bleeding Disorders; Thrombosis and Embolism; Shock; Atherosclerosis; Amyloidosis; Glycogen Storage Diseases; Diabetes Mellitus; Parathyroid Pathology and Metabolic Bone Disease; Disorders of Melanin Metabolism; Nevi and Melanomas; Pathology of Skeletal Muscle; Pathology of the Small Intestine; Pathology of the Colon; Pulmonary Pathology; Pathology of Lymphoid Organs; Parasitology. To be offered in alternate years. Prerequisite: PATH 501, or consent of Department. Restricted to Postgraduate Medical Education students or consent of Department.

**PATH 504 Seminars in General Pathology**

★1 (*fi 2*) (either term, 1-0-0).

**PATH 506 Medical Biochemistry**

★6 (*fi 12*) (two term, 2-0-0). Advanced seminars on instrumentation, Hepatic, Renal, Pancreatic Endocrine and Exocrine Functions; Enzymology and Diagnostic Applications of Enzyme Determinations, Hyperlipidemias. Prerequisite: Undergraduate courses in Medical Physiology and Biochemistry. To be offered in alternate years.

**PATH 507 Medical Biochemistry**

★6 (*fi 12*) (two term, 2-0-0). Advanced seminars on Metabolic Disorders of Carbohydrates and Amino Acids, Nutritional Deficiencies and Malnutrition, Endocrine Functions, Organization and Quality Control in Medical Biochemistry. Prerequisite: PATH 506 or consent of Department. To be offered in alternate years.

**PATH 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.

**PATH 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.

**PATH 520 Pathology Research Seminar**

★1 (fi 2) (two term, 0-1s/2-0). Graduate seminars presented by graduate students, faculty and guests in the Department. Required of all pathology graduate students.

**201.167 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.

**Undergraduate Courses****PET E 295 Introduction to Fundamental Petroleum Engineering**

□3.8 (fi 6) (second term, 3-0-3/2). The relationships of geology, basic reservoir rock properties, surface and interfacial phenomena, the flow of fluids through porous media, classification of oil and natural gas reservoirs, and introduction to reserve estimation principles. Prerequisite: consent of Instructor. (★3)

**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. Prerequisites: CH E 243 and MATE 390. Corequisite: CHEM 271. (★3)

**PET E 364 Oil Well Drilling and Completion**

□3.5 (fi 6) (first term, 3-1s-0). Elements of rock mechanics, drilling fluids, factors affecting rate of penetration, formulation evaluation and well completions. Prerequisites: CIV E 270 and either CHEM 271 or CH E 243, or consent of Instructor. (★3)

**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: consent of Instructor. (★3)

**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. Prerequisite: PET E 295 or consent of Instructor. (★3)

**PET E 444 Natural Gas Engineering**

□3 (fi 6) (first term, 3-0-0). Topics include gas properties, resources and reserves estimation, material balance equation, decline curve analysis, gas well deliverability, gas well testing, gas storage, transmission. Prerequisite: PET E 362 or consent of Instructor. (★3)

**PET E 465 Well Logging and Formation Evaluation**

□3.5 (fi 6) (first 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 362, or consent of Instructor. (★3)

**PET E 470 Heavy Oil Recovery**

□3 (fi 6) (first 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. (★3)

**PET E 471 Enhanced Oil Recovery**

□3 (fi 6) (either term, 3-0-0). Classification of EOR methods. Chemical oil recovery methods. Principles of polymer flooding. Principles of surfactant flooding. Oil displacement by surfactant solutions, principles of alkaline flooding, principles of micellar flooding, oil displacement by micellar solutions, design of scaled models. Heavy oil recovery by thermal methods. Other chemical oil recovery methods. Prerequisite: consent of Instructor. (★3)

**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. (★3)

**PET E 475 Applied Reservoir Engineering**

□3.8 (fi 6) (second term, 3-0-3/2). Analysis and prediction of reservoir performance by use of material balance. Reservoir performance by use of decline curves. Fluid displacement, pressure maintenance and enhanced recovery. Prerequisite: PET E 473. (★3)

**PET E 477 Modelling in Petroleum Engineering**

□3 (fi 6) (second term, 3-0-0). Fundamentals of Modelling in Petroleum Engineering. Simulation methods as applied to specific problems in petroleum reservoir behavior. Examples will be drawn from primary, secondary and tertiary recovery phases of petroleum production. Prerequisites: PET E 473, ENCOMP 100 and MATH 200 or equivalent. (★3)

**PET E 484 Oil and Gas Property Evaluation**

□3.5 (fi 6) (first term, 2-0-3). 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. Prerequisite: MEC E 310 or equivalent. (★3)

**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. (★0.5)

**PET E 489 Petroleum Seminar**

□1 (fi 2) (second term, 1-0-0). Meeting of students and staff for discussion of topics related to petroleum engineering. (★1)

**PET E 496 Petroleum Engineering Design Project**

□4 (fi 6) (either 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 or consent of Instructor. (★3)

**Graduate Courses****PET E 614 Well-Logging and Formation Evaluation**

□3 (fi 6) (either term, 3-0-0). 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. (★3)

**PET E 630 Petroleum Reservoir Engineering**

□3 (fi 6) (first term, 3-0-0). Characteristics of reservoir materials (rock, reservoir fluids); reservoir evaluation (volumetric method, material balance method with water influx), fundamental production processes (primary recovery). (★3)

**PET E 632 Advanced Topics in Petroleum Production Mechanics**

□3 (fi 6) (second term, 3-0-0). 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. (★3)

**PET E 634 Secondary Recovery**

□3 (fi 6) (second term, 3-0-0). Evaluation and operation of secondary recovery projects; fundamental consideration of petroleum engineering and reservoir behavior applied to secondary recovery of oil; recent technical papers. (★3)

**PET E 635 Numerical and Analytical Solution of Porous Media Flow Problems**

□3 (fi 6) (first term, 3-0-0). 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. (★3)

**PET E 644 Fluid Mechanics of Natural Gas Production**

□3 (fi 6) (first term, 3-0-0). 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. (★3)

**PET E 650 Reservoir Simulator Development**

□3 (fi 6) (second term, 3-0-0). 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. (★3)

#### **PET E 668 Advanced Well Test Analysis**

□3 (fi 6) (first term, 3-0-0). 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. (★3)

#### **PET E 682 Graduate Seminar**

□0.5 (fi 2) (variable, 0-1s-0). Discussion of progress and problems in research underway in the Department. (★1)

#### **PET E 684 Oil and Gas Property Evaluation**

□3 (fi 6) (either term, 3-0-0). Economic structure of the petroleum industry; oil and gas land tenure; factors influencing oil economics; time value of money; taxation of oil and gas properties and income; engineering analysis; application of data in the analysis; estimation of costs; evaluation of processing facilities; analysis of profitability; risk and decision analysis in evaluations; the evaluation report. Note: not open to students with credit in PET E 484. (★3)

#### **PET E 685 Advanced Economic Evaluation of Mineral Resources**

□3 (fi 6) (either term, 3-0-0). Decision analysis and project profitability criteria; technical, cost, and venture feasibility studies; current economic evaluation methods; risk and uncertainty analysis; advanced economic evaluation methods; case studies in mineral economic evaluations. (★3)

#### **PET E 694 Advanced Topics in Petroleum Engineering**

□3 (fi 6) (either term, 3-0-0). An advanced treatment of selected petroleum engineering topics of current interest to staff and students. (★3)

#### **PET E 732 Reservoir Engineering**

□3 (fi 6) (either term, 3-0-0).

#### **PET E 734 Secondary Recovery**

□3 (fi 6) (either term, 3-0-0).

#### **PET E 744 Natural Gas Engineering**

□3 (fi 6) (either term, 3-0-0).

## 201.168 Pharmacology, PMCOL

Department of Pharmacology  
Faculty of Medicine and Dentistry

### Undergraduate Courses

The following courses can be used by students in the Faculty of Science as science courses: PMCOL 201, 305, 336, 342, 371, 403, 407, 409, 412, and 415.

#### **□ 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 will be addressed and the underlying pharmacological principles illustrated with examples drawn from an array of commonly used drugs. Prerequisites: CHEM 101 and CHEM 102, and either BIOL 107 or BIOL 108.

#### **□ 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. Prerequisites: a 200-level Biological Sciences course (or equivalent).

#### **PMCOL 331 General Pharmacology**

★6 (fi 12) (two term, 3-0-0). The pharmacological actions of drugs selected for their physiological and clinical significance. Basic pharmacological principles are applied to representative clinically important drugs having their primary actions on various organ systems of the body. The course includes a study of chemotherapeutic agents used in the treatment of infections and neoplasia. Restricted to students in the Faculty of Pharmacy and Pharmaceutical Sciences.

#### **PMCOL 337 Experimental Procedures in Pharmacology**

★3 (fi 6) (either term, 1-0-6). 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. The course will include both a theoretical consideration of the procedures under study, together with practical instruction and practice in their execution. Prerequisite or corequisite: Normally restricted to Pharmacology Specialization or Honors programs. PMCOL 342 or consent of Department.

#### **PMCOL 342 Scientific Basis of Pharmacology**

★6 (fi 12) (two term, 3-0-0). This course will provide detailed scientific information about clinically important drugs having their primary actions on various organs of the body. It is intended to provide a sound scientific knowledge of the mechanism of action of the relevant drugs. The experimental basis of present day clinical knowledge will be discussed in detail. Prerequisite: PMCOL 201. Prerequisite or corequisite: BIOCH 203, 205 and PHYSL 210 or 211. Normally restricted to students in Pharmacology Specialization or Honors programs.

#### **□ 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, 211, 252, or ZOO 242.

#### **PMCOL 401 Pharmacology Tutorial**

★3 (fi 6) (first term, 3-0-0). Research or Reading course. This course allows a student to study an area of pharmacology 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 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.

#### **PMCOL 402 Pharmacology Tutorial**

★3 (fi 6) (second term, 3-0-0). Research or Reading course. This course allows a student to study an area of pharmacology 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 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.

#### **PMCOL 403 Introduction to Toxicology**

★3 (fi 6) (either term, 3-0-0). Offered in alternate years. 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: BIOCH 203 and 205, PHYSL 210 or 211, or consent of Department.

#### **PMCOL 404 Advanced Chemotherapy**

★3 (fi 6) (either term, 3-0-0). A discussion of chemotherapeutic agents used in the treatment of viral, bacterial, fungal, protozoal, and helminthic infections, and cancer. Some attention will be paid to new agents currently undergoing clinical evaluation. Detailed descriptions of the metabolism, mechanisms of action, pharmacokinetics, and adverse effects of selected chemotherapeutic agents will be presented, as will mechanisms of drug resistance. Prerequisites: BIOCH 203 and 205, PHYSL 210 or 211, PMCOL 342 (or equivalent), or approved courses in biochemistry and vertebrate physiology and consent of Department.

#### **PMCOL 407 Neuromuscular Pharmacology**

★3 (fi 6) (either term, 3-0-0). A detailed study of synaptic transmission, excitation-contraction coupling in skeletal muscle, and the drugs known to be active at these sites. Diseases of neuromuscular transmission, their etiology, and therapy will also be included. The scope of the lectures will range from molecular considerations, through structure-activity relationships, to clinical usefulness and experience. Prerequisites: PMCOL 342 or 371.

#### **PMCOL 409 Current Research Topics in Pharmacology**

★3 (fi 6) (either term, 3-0-0). An introduction to current areas of research in Pharmacology. The aim of the course is to provide students with an overview of recent developments and future trends in Pharmacology research and to illustrate how research problems are identified and addressed. Individual members of the Department of Pharmacology will provide background to their field of research followed by examples of the current research conducted in their own laboratories. In addition, some areas of research outside of those being pursued in the Department of Pharmacology will be covered. Topics will include the electrophysiological characterization of synaptic transmission in central and autonomic nervous systems, biochemical and molecular biological analysis of ion channels. Liposomes and immunopharmacology, nucleoside transporter processes, cardiovascular pharmacology and clinical pharmacology. Prerequisites: PMCOL 342 (or equivalent).

#### **□ 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. Students with approved 300-level biological

science course(s) and an interest in pharmacology and/or neuroscience are encouraged to enrol. Prerequisites: PMCOL 342 or 371 (or equivalent).

#### **PMCOL 415 Cardiovascular Pharmacology**

★3 (*fi 6*) (either term, 3-0-0). A lecture course in which the pharmacology of drug action on the cardiovascular system is examined. Topics covered 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. The course will also provide an overview of current therapeutic options in the treatment of cardiovascular disease. Pre- or Corequisites: PMCOL 342 (or equivalent).

#### **PMCOL 433 Topics in Therapeutics and Problem Solving**

★1 (*fi 2*) (first term, 23 hours). For third-year medical students only.

#### **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 a written report on the part of the student. Prerequisite: consent of Department. 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*) (either term, 3-0-0). A discussion of selected topics of current interest in toxicology, including issues in environmental and occupational toxicology, forensic toxicology, mechanisms of cellular injury by toxicants, and mechanisms of chemical carcinogenesis. This course is intended for senior undergraduate and graduate students. Prerequisites: PMCOL 403 (or equivalent) and consent of Department.

#### **PMCOL 505 Cancer Chemotherapy**

★3 (*fi 6*) (either term, 3-0-0). A survey of biochemical, cellular, and clinical pharmacology of agents currently employed in chemotherapy of neoplastic disease; drug metabolism, adverse effects, mechanisms of action and of resistance will be discussed. Prerequisites: BIOCH 203 and 205 or equivalent and consent of Department.

#### **PMCOL 506 The Actions of Drugs on Membranes**

★3 (*fi 6*) (either term, 3-0-0). This course will examine the interactions of drugs with biological membranes and model membrane systems. The effects of various classes of drugs on membrane permeation processes, receptors, lipids, and enzymes will be explored in class discussions of assigned reading from the current literature. The major emphasis will be on plasma membranes of vertebrate cells. Prerequisite: consent of Instructor.

#### **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 509 Biophysical Aspects of Neuropharmacology**

★3 (*fi 6*) (either term, 3-0-0). This course aims to provide an examination in depth of the mechanisms of action of drugs at the level of the single excitable cell. The course includes a review of basic membrane biophysics, neurotransmitter release mechanisms and post synaptic effects of neurotransmitters and other ligands. Time will also be devoted to selected special topics. 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 Neurotransmitters**

★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 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 600 Seminar in Pharmacology**

★0 (*fi 2*) (two term, 0-1s-0). Open to graduate students in the Department of Pharmacology and other interested graduate students. Speakers either from the University of Alberta or invited from elsewhere will present weekly research seminars on topics related to pharmacology and the interests of the Department. Graduate students will be required to present at least one seminar based on a topic from the literature or their research project during the year. Prerequisite: consent of Department.

## 201.169 Pharmacy, PHARM

Faculty of Pharmacy and Pharmaceutical Sciences

### Undergraduate Courses

#### **PHARM 302 Introduction to the Profession of Pharmacy**

★3 (*fi 6*) (first term, 3-4s-0). Introduction to the Canadian Health Care System, the pharmacist's role and the needs of patients. Information and use of some non-prescription drugs, medical surgical products and basic emergency treatment. Development of verbal communication skills. (Restricted to Pharmacy students.)

#### **PHARM 303 Pharmacy Dispensing Procedures and Pharmaceutical Calculations**

★3 (*fi 6*) (second term, 3-0-3). An introduction to the technical aspects of dispensing, pharmaceutical calculations, dosage forms and drug procurement. Development of basic patient medication counselling skills. Exposure to the need for accuracy and accountability as a professional responsibility. Prerequisite: PHARM 302. (Restricted to Pharmacy students.)

#### **PHARM 320 Introduction to Medicinal Chemistry**

★6 (*fi 12*) (two term, 3-0-0). The development of drugs. Physicochemical properties and biologic activity. The relationship of these properties to the absorption, distribution and elimination of drugs. The metabolism of drugs, enzymes, pathways, mechanisms and substrates. Drug-receptor interactions and receptor-site theory. Prerequisites: CHEM 101/102 and CHEM 161/163. Corequisite: PHYSL 252. (Restricted to Pharmacy students.)

#### **PHARM 325 Introduction to Quantitative Pharmaceutical Analysis**

★3 (*fi 6*) (second term, 3-0-3). Chemical methods of quantitative analysis. The laboratory exercises consist of both instrumental and non-instrumental pharmacopoeial techniques that are widely employed in the analysis of pharmaceuticals. Prerequisites: CHEM 101/102 and 161/163. (Restricted to Pharmacy students.)

#### **PHARM 340 Pharmacy Administration**

★3 (*fi 6*) (second term, 3-2s-0). An introduction to the elements of pharmacy administration consisting of management principles, pharmaceutical marketing, and practice management. Provides the student with an understanding of the economic, political, and professional environment of the profession of pharmacy. (Restricted to Pharmacy students.)

#### **PHARM 352 Jurisprudence and Ethics**

★3 (*fi 6*) (first term, 3-1s-3). A study of the laws 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. Development of verbal communication skills with emphasis on pharmacist-patient, and pharmacist-other health professional relationships. A study of the psychological aspects of illness. Prerequisite: PHARM 303. (Restricted to Pharmacy students.)

#### **PHARM 360 Pharmaceutics**

★6 (*fi 12*) (two term, 3-1L-2). 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. Prerequisites: PHARM 303 and MATH 113. (Restricted to Pharmacy students.)

#### **PHARM 370 Medicinal Chemistry**

★6 (*fi 12*) (two term, 3-0-0). The study of organic medicinal substances. The design and synthesis, physico-chemical properties, mechanism of action, metabolism and structure-activity relationships of drug classes are discussed. Prerequisite: PHARM 320.

#### **PHARM 380 Introduction to Disease Processes**

★3 (*fi 6*) (first term, 3-0-0). The nature of disease, causes, processes, effects and associated alterations in structure and function. Prerequisite or corequisite: ANAT 200, PHYSL 252. (Restricted to Pharmacy students.)

**PHARM 403 Toxicology of Drugs and Related Products**

★3 (fi 6) (first term, 3-3s-0). Topics discussed include poisoning and its emergency treatment; toxicity of analgesics, antibiotics, iron, common drugs and household products, food additives; CNS and PNS toxicity; nephrotoxicity and hepatotoxicity; toxicity to the ear; ocular and epidermal toxicity; toxicity of pesticides and herbicides; neonatal and geriatric toxicology; carcinogenicity and teratology; porphyrias, blood dyscrasias; placental transfer of drugs; drugs in milk. Corequisites: PHARM 415 and 431. (Restricted to Pharmacy students.)

**PHARM 404 Clinical Pharmacy**

★3 (fi 6) (second term, 3-0-0). Lecture/discussion sessions are used to demonstrate clinical pharmacy responsibilities in a selected number of areas. Experience will be gained in using a case history, patient management approach to clinical problem solving. Topics of discussion include clinical laboratory tests, applied clinical pharmacokinetics, advanced OTCs, drug information, drug substance abuse, and clinical drug interactions. Corequisite: PHARM 431. (Restricted to Pharmacy students.)

**PHARM 405 Introduction to Institutional Practice and Patient Counselling with the Emphasis on Nonprescription Drugs**

★3 (fi 6) (first term, 3-1s-3). An understanding of the drug distribution system in hospitals. An evaluation of drug literature. Introduction to the workshop format and patient interviewing. An understanding of the role of self-medication in health care. An introduction to nonprescription drug products and the Drug Caution Code. Prerequisite: PHARM 352. (Restricted to Pharmacy students.)

**PHARM 406 Monitoring Drug Therapy Based on Patient Interviews, Patient Counselling and Drug Information**

★3 (fi 6) (second term, 3-1s-3). Lectures and laboratory exercises to develop the student's skills in clinical pharmacy practice relating to patient interviewing, dispensing, counselling and monitoring drug therapy. Prerequisites: PHARM 405, 415, and PMCOL 331. Corequisite: PHARM 331. (Restricted to Pharmacy students.)

**PHARM 415 Biopharmaceutics and Pharmacokinetics**

★3 (fi 6) (first term, 3-0-0). Application of biopharmaceutics and pharmacokinetics to patient care and drug therapy. Clinical pharmacokinetics of selected classes of drugs. Prerequisites: PHARM 320 and PHARM 360. Corequisite: PHARM 431.

**PHARM 431 Therapeutics**

★6 (fi 12) (two term, 3-0-0). Integrated lectures and seminars on the pharmacological action of drugs and the therapeutics of common diseases. Basic pharmacological principles; mechanisms of actions of drugs; rationale of drug therapy and problems associated with the use of drugs in the disease state; the role of the pharmacist in therapeutics. Prerequisite: PMCOL 331. (Restricted to Pharmacy students.)

**PHARM 432 Antimicrobial Agents and Infectious Diseases**

★3 (fi 6) (second term, 3-2s-0). Integrated lectures and seminars on the use of antimicrobial agents in infectious diseases. Antibacterial, antifungal and antiviral agents will be discussed under the following headings: structure and relation to activity, mechanism of action, antimicrobial spectrum of activity, development of microbial resistance, pharmacokinetic properties and therapeutic use. Seminars and case studies focus on the pathogenesis and treatment of selected infectious diseases. (Restricted to Pharmacy students.)

**PHARM 443 Radiopharmaceutical Sciences I**

★3 (fi 6) (second term, 3-0-0). Basic principles involving the application of radiation and radioactive compounds in medical diagnosis, therapy and industry. Rationale for utility, preparation and quality control of radiopharmaceuticals. Biologic effects of various radiations. Prerequisites: ANAT 200, PHYSL 252, BIOCH 203/205.

**PHARM 456 Clinical Pharmacy Rotations**

★15 (fi 30) (either term, 12 weeks). The student will be expected to demonstrate professional and technical competencies in a variety of practice situations, including counselling patients, obtaining medication histories, providing drug information, monitoring and evaluating drug therapy, adverse drug reaction assessment and reporting, and therapeutic drug monitoring. Prerequisites: PHARM 403 and 431, PMCOL 331. (Restricted to Pharmacy students.)

**PHARM 457 Contemporary Issues in Pharmacy**

★2 (fi 4) (either term, 1-0-0). Historical developments, impact, and significance of developments in the field of pharmacy. (Restricted to Pharmacy students.)

**PHARM 458 Hospital Pharmacy**

★3 (fi 6) (either term, 3-0-0). Current literature analysis and presentation of modern concepts in drug distribution, drug information systems, application of data processing to decentralized pharmacy services and administrative principles peculiar to institutional pharmacy. (Restricted to Pharmacy students.)

**PHARM 460 Sterile Products**

★3 (fi 6) (either term, 3-0-3). This course is designed as a comprehensive education in sterile pharmaceutical products that may be prepared and/or dispensed by a hospital pharmacy department. Specific distribution systems and administration techniques will also be discussed. In addition to didactic education, practical experience will be provided in the laboratory section of the course. Prerequisite: PHARM 360. (Restricted to Pharmacy students.)

**PHARM 461 Sterile Products**

★3 (fi 6) (either term, 3-0-0). Lecture portion only of PHARM 460. Prerequisite: PHARM 360. Restricted to Pharmacy students.

**PHARM 471 Pain Module**

★3 (fi 6) (first term, 0-3s-0). This module is designed to enable senior pharmacy students to understand and apply the principles of pain management to patients presenting with pain. This course integrates knowledge of pain etiologies, pharmacology, medicinal chemistry, and pharmacokinetics with the therapeutics of pain management. Patient care, skill development and application of pharmaceutical sciences to management and treatment of pain are emphasized. This module is delivered as a seminar course and uses computer conferencing to facilitate communication among students and faculty to foster a collaborative learning environment. Site visits are an integral component of this course. Restricted to Pharmacy students.

**PHARM 483 Home Health Care**

★3 (fi 6) (second term, 3-0-0). To acquaint students with the variety of home health care products; to demonstrate the proper assembly, fitting, adjustment, and use of various products and supplies; to discuss the economics, marketing, and management of running a home health care department and supplying home health care products and services. (Restricted to Pharmacy students.)

**PHARM 484 Immunization for Health**

★3 (fi 6) (second term, 3-0-0). Current principles of immunization - recommended immunization schedules, vaccines against viral and bacterial diseases of concern to Canadians; immunization and health considerations for health care professionals, international travellers, and day care attendees; selected topics of current interest, time permitting.

**PHARM 485 Medication Use in the Canadian Health Care System**

★3 (fi 6) (second term, 3-0-0). An examination of the Canadian health care system with a focus on medication use and the profession of pharmacy. The course is organized in three general areas: 1) the Canadian health care system, 2) medication use in the Canadian health care system, and 3) medication use management within health care systems. The overall goal is to provide a wider awareness of the systems within which pharmacists work, and factors influencing the systems. Particular attention is given to medication formulary decision making at the provincial, regional and institutional levels. Restricted to Pharmacy students.

**PHARM 489 Seminars in Therapeutics and Professional Practice**

★3 (fi 6) (either term, variable). A seminar course for fourth year pharmacy students covering selected topics in therapeutics, pharmacokinetics and clinical pharmacy. Prerequisites: PHARM 403, 415, and 431. (Restricted to Pharmacy students.)

**PHARM 493 Pharmaceutical Biotechnology**

★3 (fi 6) (either term, 3-0-0). An introduction to the development of protein and peptide drugs, vaccines, and other drugs produced by biotechnological techniques involving molecular biology and/or genetic manipulations. Topics will include basic principles, descriptions of objectives and methodology, and examples of modern drugs produced by these techniques. Therapeutic effects and clinical implications of currently marketed products will be addressed. Prerequisites: PHARM 431, BIOCH 203/205 and MICRB 193 or consent of the Faculty.

**PHARM 494 Pharmacy Management: Selected Topics**

★3 (fi 6) (either term, variable). Continuation of PHARM 340 with emphasis on financial management and the management of human resources. Projects on pharmacy operations. Prerequisite: PHARM 340.

**PHARM 498 Pharmaceutical Research**

★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. (Restricted to Pharmacy students.)

**Graduate Courses**

**Note:** The following undergraduate courses may be taken for credit by graduate students: PHARM 415, 473, 481, 484, 494, 496.

**PHARM 565 Clinical Pharmacokinetics**

★3 (fi 6) (either term, 2-2s-0). A comprehensive course dealing with basic pharmacokinetic principles of dosage regimen calculation and pharmacokinetic considerations relating to the use of various drugs. Clinical pharmacokinetics of therapeutically important drugs will be covered in detail. The laboratory portion is designed to expose the students to the methods used in dosage-regimen adjustment based on the clinical status of the patient. Prerequisites: PHARM 415 and 431, PMCOL 331 and consent of the Faculty. (Restricted to Pharmacy students.)

**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: PHARM 325 or consent of Faculty.

#### PHARM 575 Advanced Pharmaceutical Analysis

★3 (*fi 6*) (first term, 3-0-3). The theory and application of chromatographic techniques to the identification and quantitation of drugs, drug metabolites, and toxic substances. An introduction to forensic analyses, types of screening tests, and the systematic analysis of biological samples for drugs and specific poisons. Prerequisite: PHARM 325 or consent of the Faculty. Offered in even-numbered 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 586 Pharmaceutical Toxicology

★3 (*fi 6*) (either term, 3-3s-0). Methods used to evaluate the toxic potential of drugs and other chemicals, including a discussion of selected topics in toxicology, such as environmental hazards, respiratory toxicity and neurotoxicity of chemicals. Seminars will cover specific problems in predictive toxicology and the toxicity of specific agents. Prerequisites: PHARM 431 and PMCOL 331 or consent of the Faculty.

#### 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 443 or 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 340.

#### 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 Physical Pharmacy

★3 (*fi 6*) (first term, 3-0-4). Special topics of a physical-chemical nature applicable to pharmaceutical systems. Emphasis is given to principles of colloid and surface science. Applications to dosage form design and biological systems are considered. Laboratory: experimental work in application of physicochemical principles to pharmaceutical systems. Prerequisite: consent of Faculty.

#### PHARM 611 Pharmaceutical Formulation and Development

★3 (*fi 6*) (second term, 3-0-4). 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 415 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 626 Applications of Mass Spectrometry to Medicinal and Pharmaceutical Chemistry

★3 (*fi 6*) (either term, 3-0-0). Examples of the use of mass spectrometry in the identification of medicinal compounds are considered. Diagnostic spectra of extracts of medicinal preparations, identification of drug metabolites and applications of mass spectrometry to chemical toxicology and neurochemistry are studied. Prerequisite: consent of Faculty. Note: Offered alternate years.

#### PHARM 630 The Metabolism and Excretion of Drugs

★3 (*fi 6*) (second 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 664 Advanced Topics in Clinical Pharmacy

★3 (*fi 6*) (first term, 1-0-3). Tutorial and practicum sessions used to review advances in therapeutics and to demonstrate clinical pharmacy responsibilities in a selected number of disease states. The student will have the opportunity to develop practical skills in establishing safe and effective drug use and in providing patient directed information on specific therapeutic agents. Major areas such as hypertension, diabetes and renal disorders will be considered. Prerequisites: PHARM 404, 431, and PMCOL 331 or consent of Faculty.

#### PHARM 685 Methods for the Assessment of Health Related Quality of Life

★3 (*fi 6*) (first 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.

#### 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 691 Methods in Pharmacy Practice Research

★3 (*fi 6*) (either term, 0-3s-0). A review of major approaches in pharmacy administration research. Some of the topics to be covered are: cost-benefit analysis, workload measurement, pricing methods, and quality improvement.

#### 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*) (either term, 0-1s-0). Seminar training and short seminar presentations on topics related to the student's field of research. Normally to be taken 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 defence. Required of all MSc and PhD students.

#### PHARM 900 Directed Research Project

★6 (*fi 12*) (variable, unassigned).

## 201.170 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. Anciennement PHILE 121 ou 221.

**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. Anciennement PHILE 240

**Note:** A moins d'indication contraire, il n'y a pas de prérequis formels pour les cours au niveau 200. Toutefois, les étudiants qui désirent s'inscrire à ces cours trouveront qu'il est très avantageux d'avoir d'abord suivi un cours de philosophie du niveau 100, tel le 125 ou le 140. Il est recommandé aux étudiants qui veulent poursuivre des études en logique formelle de consulter la note (1) dans la description des cours sous "Philosophy," Faculté des Arts.

**PHILE 209 Une étude philosophique de l'être humain**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Un regard sur l'être humain: sa connaissance, ses façons d'aimer. Anciennement PHILE 302.

**PHILE 215 Critique de la connaissance**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction aux questions visant la connaissance, surtout en ce qui concerne ses sources et sa justification. Ce cours comporte des sujets de discussion, tels le scepticisme et la certitude; la vérité, la foi ou la croyance et la justification; la connaissance du monde extérieur; la perception, la pensée et la mémoire; la connaissance a priori et empirique. Anciennement PHILE 322 ou 301.

**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.

**PHILE 392 Philosophie récente de l'Europe continentale**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction à un ou plusieurs des mouvements post-existentialistes en Europe continentale, tels que la phénoménologie, l'herméneutique, la théorie critique, le structuralisme, le post-structuralisme, etc. Prérequis: PHILE 140, ou 291, ou l'autorisation du Doyen. Anciennement PHILE 327.

## 201.171 Philosophy, PHIL

Department of Philosophy  
Faculty of Arts

## Notes

- See also INT D 331 and 498 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.
- 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.
- There are no formal prerequisites for 200- or 300-level courses (except for PHIL 220). Entrance to 400-level courses requires six units of course weight of prior courses in Philosophy, at least three of which must be at the 200-level.

The following table lists renumbered courses effective 1997/98:

Old	New
PHIL 395	PHIL 453
PHIL 320	PHIL 420

The following table lists renumbered courses effective 1994/95:

Old	New	Old	New
PHIL 210	PHIL 375	PHIL 290	PHIL 357
PHIL 260	PHIL 387	PHIL 293	PHIL 331
PHIL 262	PHIL 385	PHIL 301	PHIL 215
PHIL 264	PHIL 386	PHIL 310	PHIL 265
PHIL 266	PHIL 355	PHIL 330	PHIL 242
PHIL 272	PHIL 382	PHIL 340	PHIL 245
PHIL 274	PHIL 332	PHIL 372	PHIL 473

## 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. Note: Not open to students with credit in PHIL 130 or 140.

**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. Note: Not open to students with credit in PHIL 130 or 140.

**PHIL 110 Philosophical Texts**

★3 (fi 6) (either term, 0-3s-0). Intensive study of different modes of philosophical writing including dialogue, meditation, essay, aphorism, treatise, formalized argument, etc. Excerpts from a range of major and minor authors (e.g. Augustine, Descartes, Montaigne, Rousseau, Nietzsche, Quine) will be studied. The course emphasizes the close reading and analysis of texts.

**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. Note: Not open to students with credit in PHIL 121 (in 1991/92) or PHIL 221 (prior to 1991/92).

**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). Approaches to the question of what it means to be a person and have a mind. The relationship of philosophical ideas to scientific investigations of mental phenomena will be studied. Topics may include the mind-body relationship, personal identity, memory, imagination, intention and the will, desire, emotion and sensation.

**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, scepticism and the limits of knowledge, relativism and the objectivity of knowledge, the role of perception, memory and reason as sources of knowledge. Note: Not open to students with credit in PHIL 301.

**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 242 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 330.

**PHIL 245 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 340.

**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. Note: Not open to students with credit in PHIL 310.

**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 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 316 Philosophy of the Social Sciences**

★3 (fi 6) (either term, 3-0-0). A study of selected philosophical and methodological problems in the human sciences. Consideration may be given to entire movements such as positivism or critical theory as well as to specific concepts they employ such as ideology, value neutrality, methodological individualism, class and utopia. Authors covered may include such figures as Weber, Habermas, Popper, and Winch.

**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 331 Introduction to Asian Philosophy**

★3 (fi 6) (either term, 3-0-0). An introduction to one or more systems of philosophy arising in Asia: Buddhism, Daoism, Confucianism, Shintoism, Hinduism, Jainism, or one of the Hindu schools, etc. Note: Not open to students with credit in PHIL 293.

**PHIL 332 Feminist Issues in Political and Social Philosophy**

★3 (fi 6) (either term, 3-0-0). An introduction to feminist issues in current social and political philosophy. Comparison and evaluation of various schools of current feminist thought such as liberal feminism, radical feminism, Marxist feminism, and socialist feminism. Note: Not open to students with credit in PHIL 274.

**PHIL 336 Early Medieval Philosophy**

★3 (fi 6) (either term, 3-0-0). Major philosophers in the Christian and Islamic traditions up to the reintroduction of Aristotelian texts in the early 12th century. Prerequisite: PHIL 230 or consent of Department.

**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. Note: Not open to students with credit in PHIL 266.

**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. Note: Not open to students with credit in PHIL 290.

**PHIL 365 Cyberphilosophy**

★3 (fi 6) (either term, 2-0-1). An introduction to philosophical reflection on computers, computing, and the changes being wrought by the computer revolution. This course has a laboratory component. No previous familiarity with computing is presupposed.

**PHIL 366 Computing Ethics**

★3 (fi 6) (either term, 2-0-1). A philosophical study of the moral issues raised by the impact on society of computers and related technology. In addition to an overview of relevant moral theory, the course will address topics such as privacy, censorship, freedom, property rights, professional ethics, netiquette, moral problems about computing in the workplace, moral problems about computing in leisure, and children and computers.

**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 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. Note: Not open to students with credit in PHIL 210.

**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 382 Philosophy of Law: Social Issues**

★3 (fi 6) (either term, 3-0-0). Philosophical problems arising at the interface between the legal system and wider social life: problems of legal liberty (harm as the limit of legal liberty, legal paternalism, legal moralism), the nature of legal liability/responsibility (the mental element in legal liability, the nature of causation in law), civil disobedience, punishment. Note: Not open to students with credit in PHIL 272.

**PHIL 385 Ethical Theory and Business**

★3 (fi 6) (either term, 3-0-0). Topics include economic justice, social and environmental responsibility of corporations, conflict of interest and conflicts between rights and profits. Note: Not open to students with credit in PHIL 262.

**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. Note: Not open to students with credit in PHIL 264.

**PHIL 387 Professional Ethics**

★3 (fi 6) (either term, 3-0-0). Introduction to ethical thinking in a professional context. Ethical issues in common to different professions are examined in relation to ethical theory. Topics may include professionalism itself, honesty and consent, privacy and confidentiality, social responsibility, and professional ethical codes. Note: Not open to students with credit in PHIL 260.

**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 400 Topics in Metaphysics**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in Philosophy, ★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 Philosophy, ★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 Philosophy, ★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 Philosophy, ★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 Philosophy, ★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 Philosophy, ★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 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 Philosophy, ★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 Philosophy, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 434 Aristotle**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in Philosophy, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 436 Topics in Later Medieval Philosophy**

★3 (fi 6) (either term, 3-0-0). Scholastic philosophy in medieval western Europe from the mid-12th century to 1350, including relevant developments in later Islamic thought. Prerequisite: At least ★6 in Philosophy, ★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 Philosophy, ★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 Philosophy, ★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 Philosophy, ★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 Philosophy, ★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 Philosophy, ★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 Philosophy, ★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 Philosophy, ★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 Philosophy, ★3 of which must be at the 200-level, or consent of Department. Formerly PHIL 395.

**PHIL 470 Topics in Social and Political Philosophy**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in Philosophy, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 473 Philosophy of Law: Theoretical Issues**

★3 (fi 6) (either term, 3-0-0). Theoretical problems in the analysis of law and the legal system: legal positivism, legal realism, natural law theory, and nature of legal reasoning, the nature of legal rights. Prerequisite: At least ★6 in Philosophy, ★3 of which must be at the 200-level, or consent of Department. Note: Not open to students with credit in PHIL 372.

**PHIL 480 Topics in Aesthetics**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in Philosophy, ★3 of which must be at the 200-level, or consent of Department.

**PHIL 484 Philosophy of Literature**

★3 (fi 6) (either term, 3-0-0). Prerequisite: At least ★6 in Philosophy, ★3 of which must be at the 200-level, or consent of 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 Philosophy, ★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 496 Honors Tutorial I**

★3 (fi 6) (either term, 3-0-0). Prerequisite: Open only to final year Honors students.

**PHIL 497 Honors Tutorial II**

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

**PHIL 498 Honors Essay**

★3 (fi 6) (second term, 3-0-0). Preparation of the honors essay, required in the fourth year of the Honors program.

**201.171.1 Philosophy (from within the RC Tradition)  
St Joseph's College**

**Note:** The following courses are offered by St Joseph's College and can be used as Arts options.

**PHIL 139 An Introduction to Christian Philosophy**

★3 (fi 6) (either term, 3-0-0). A study of early Christian thinkers' use of Greek philosophy, especially St Augustine's adaptation of Platonism and St Thomas Aquinas' adaptation of Aristotle. Note: Not available for credit with PHIL 239 or 249. Formerly PHIL 117 or 217.

**PHIL 199 Current Questions in Christian Philosophy**

★3 (fi 6) (either term, 3-0-0). A philosophical analysis from a Christian point of view of some recent philosophical positions. The main problems to be looked into will concern God, soul, truth, and goodness. Formerly PHIL 118 or 218.

**PHIL 209 Philosophy of Human Beings**

★3 (fi 6) (either term, 3-0-0). A study of human beings: their organic existence, their knowledge, their intellectual and emotional love. Formerly PHIL 302.

**PHIL 239 Foundations of Christian Philosophy**

★3 (fi 6) (either term, 3-0-0). A study of Greek philosophy and Hebrew culture, with development of themes concerning human beings, human knowledge, nature and ethics in the general thrust of Christian philosophy. Note: Not available for credit with PHIL 139. Formerly PHIL 200 or 300.

**PHIL 249 Development of Christian Philosophy**

★3 (fi 6) (either term, 3-0-0). A study of the thought of the medieval Christian thinkers, especially Augustine and Thomas Aquinas. Note: Not available for credit with PHIL 139. Formerly PHIL 201 or 301.

**PHIL 259 Ethics in Christianity**

★3 (fi 6) (either term, 3-0-0). A philosophic analysis of the roots of contemporary ethics in the Christian tradition. Formerly PHIL 305.

**PHIL 279 Human Beings in Society**

★3 (fi 6) (either term, 3-0-0). A philosophical study of human beings in association with others, dealing with such aspects as the nature of the State, authority, law, rights, duty, community. Formerly PHIL 303.

**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.

**PHIL 349 Philosophy of Being**

★3 (fi 6) (either term, 3-0-0). The metaphysics of Thomas Aquinas; being, one, true, good, and beauty. Also modern developments and criticisms of metaphysics. Prerequisite: One of PHIL 139, 140, 239, 330, or consent of the College. Formerly PHIL 304.

**PHIL 399 Christian Existentialism**

★3 (fi 6) (either term, 3-0-0). The philosophical foundations of contemporary Christian thought as seen in such authors as Kierkegaard, Marcel and Mounier. Prerequisite: One of PHIL 139, 140, 199, or consent of the College. Formerly PHIL 306.

**PHIL 439 Augustine**

★3 (fi 6) (either term, 3-0-0). A study of the Christian Platonism of St Augustine. Prerequisite: One of 130, 139, 239, 432 or consent of the College. Formerly PHIL 401.

**PHIL 449 Thomas Aquinas**

★3 (fi 6) (either term, 3-0-0). A study of certain philosophical issues based on the reading of some texts. Prerequisite: One of PHIL 139, 239, 249, 330, 434, or consent of Department or College. Formerly PHIL 403.

**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).

**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 526 Philosophy of Language**

★3 (fi 6) (either term, 3-0-0).

**PHIL 532 Aristotle**

★3 (fi 6) (either term, 3-0-0).

**PHIL 534 Topics in Greek Philosophy**

★3 (fi 6) (either term, 3-0-0).

**PHIL 536 Topics in Medieval Philosophy**

★3 (fi 6) (either term, 3-0-0).

**PHIL 543 Locke**

★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 572 Philosophy of Law**

★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.

**PHIL 696 Directed Reading III**

★3-6 (variable) (variable, 3-0-0). Prerequisite: Open only to provisional PhD candidates.

**PHIL 697 Directed Reading IV**

★3-6 (variable) (variable, 3-0-0). Prerequisite: Open only to provisional PhD candidates.

## 201.172 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) **Activity-course dress requirements for first class:** Students are expected to attend the first class of any activity course appropriately dressed for activity participation.
- (3) These courses may require the payment of additional miscellaneous fees. See §22.2.3 for details.

### Undergraduate Courses

**📖 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. Red Cross Level Blue or the ability to swim front crawl and back crawl efficiently. Credit may not be taken for both PAC 110 and PAC 100.

**📖 PAC 111 Basketball**

★1.5 (fi 3) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in individual and team activities.

**📖 PAC 112 Field Hockey**

★1.5 (fi 3) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in individual and team activities.

**📖 PAC 113 Football**

★1.5 (fi 3) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in individual and team activities.

**📖 PAC 114 Ice Hockey**

★1.5 (fi 3) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in individual and team activities. Prerequisite: Average to above average skating ability. Students must provide their own equipment: skates, sticks, hockey gloves, helmets, elbow and shin pads.

**📖 PAC 117 Rugby**

★1.5 (fi 3) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in individual and team activities. Mouth guards recommended.

**📖 PAC 118 Soccer**

★1.5 (fi 3) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in individual and team activities.

**📖 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. Students must supply 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. Students must supply their own equipment: 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. Students must provide their own equipment.

**📖 PAC 137 Volleyball**

★1.5 (fi 3) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in the fundamental skills of volleyball. Students will be taught in individual and small group settings.

**📖 PAC 140 Baseball/Fastball**

★1.5 (fi 3) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in individual and team activities.

**📖 PAC 145 Golf**

★1.5 (fi 3) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in driving, chipping, pitching and putting. This course requires the payment of additional miscellaneous fees. See §22.2.3 for details. Students must provide their own equipment.

**📖 PAC 154 Wrestling**

★1.5 (fi 3) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in takedowns and groundwork.

**📖 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 163 Figure Skating**

★1.5 (fi 3) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in edges, forward inside and outside figure eights, one foot spin, spirals, crossovers and jumps. Must provide own figure skates.

**📖 PAC 173 Athletics (Track and Field)**

★1.5 (fi 3) (first term or Spring/Summer, 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. Note: Students with credit in the old PAC 170 will not be granted credit for PAC 173 or 174.

**📖 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. Note: Students with credit in the old PAC 170 will not be granted credit for PAC 173 or 174.

**📖 PAC 180 Canoeing and Kayaking**

★1.5 (fi 3) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in strokes, manoeuvres, and rescue. Equipment is available from the Campus Outdoor Centre. Prerequisite: Red Cross AquaQuest Level 8 or RLLS Lifesaving II or YMCA Level 3, or the ability to swim front and back crawl efficiently.

**📖 PAC 181 Cross Country Skiing**

★1.5 (fi 3) (second term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in classical/skiing and hill manoeuvres. Note: one required day trip

will be scheduled on a weekend during the course. Equipment is available from the Campus Outdoor Centre.

**L 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. Equipment is available from the Campus Outdoor Centre.

**O PAC 199 Physical Activity - Level I**

★1.5 (fi 3) (either term, 0-3L-0). Acquisition of theoretical knowledge and personal skill in an individual or team activity. Refer to the Registration Procedures Booklet for section number of specific activities.

**O PAC 301 Synchronized Swimming**

★3 (fi 6) (either term, 0-3L-0). This course will include practical and theoretical sessions on synchronized swimming as a recreational and competitive sport. Personal skill development will be pursued. Course content also examines aspects of instructing, judging and coaching the sport. Prerequisite: One of Red Cross Aquaquest Level 10 or 11; RLSS Lifesaving III; YMCA Level 5; PAC 110; or PAC 310 is desirable.

**O PAC 303 Skin and Scuba Diving**

★3 (fi 6) (Spring/Summer, 3-0-1). This course examines the scientific principles of skin and scuba diving and their practical application to the sport of skin and scuba diving. Course may lead to scuba certification, but requires the completion of open water dives. Prerequisite: Red Cross Blue Level or equivalent swimming skill. It is essential students feel comfortable in the water.

**L 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. Credit may not be taken for both PAC 310 and PAC 300 or 400.

**L 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 or consent of Faculty.

**L PAC 313 Analysis and Instruction of Football**

★3 (fi 6) (first term, 0-3L-0). Development of individual skills as well as basic unit and team play. Coaching fundamentals and administrative skills are discussed. This course may be inclusive of the content of the NCCP (Football) Technical Levels I and II. Prerequisite: PAC 113 or consent of Faculty.

**L 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 and shin pads. Prerequisite: PAC 114 or consent of Faculty.

**L 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 or consent of Faculty.

**L PAC 320 Structure and Strategy of Games**

★3 (fi 6) (either term, 1-2s-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.

**L PAC 325 The Study of Games for Children**

★3 (fi 6) (either term, 1-2s-0). A study in depth of the games played by children in informal situations and in organized programs. Opportunities to observe and work with children will be provided. Prerequisite: PEDS 292, 293, 338, or PAC 320.

**L 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. Students must provide their own racquets and shuttlecocks. Prerequisite: PAC 131 or consent of Faculty.

**L 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. Students must provide their own racquets, balls, and eye guards. Students with credit in PAC 334 will not be granted credit in PAC 333. Prerequisite: PAC 133 or consent of Faculty.

**L 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. Students must provide their own racquets, balls, and proper shoes. Prerequisite: PAC 135 or consent of Faculty.

**L 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. May lead to NCCP Level I Technical certification. Prerequisite: PAC 137.

**O PAC 345 Analysis and Instruction of Golf**

★3 (fi 6) (first term, 0-3L-0). The theory, practice, and teaching of the fundamental skills of golf. This course requires the payment of a miscellaneous fee (see §22.2.3 for details). Students must provide their own equipment. (For BPE students only.) Prerequisite: PAC 145 or consent of Department.

**O 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 or consent of Faculty.

**L 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.

**L 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. May lead to certification in Level I NCCP. Prerequisite: PAC 160 or consent of Faculty.

**O PAC 361 Analysis and Instruction of Educational Gymnastics**

★3 (fi 6) (either term, 0-3L-0). Progressive educational gymnastics themes, based upon movement concepts, are developed at practical activity and theoretical levels. Course instruction reflects primarily problem solving and discovery techniques to allow individuals and small groups to select and develop themes appropriate for apparatus and floor work. Prerequisite: PAC 160 or consent of Faculty.

**L PAC 365 The Study of Gymnastics for Children**

★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 at various ages. Class members will be required to plan, present, and evaluate gymnastic activities for children. Prerequisite: One of PEDS 292, PEDS 293, PEDS 338, PAC 160, PAC 361, or consent of Faculty.

**O 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 or equivalent course.

**O PAC 380 Analysis, Instruction, and Leadership of Canoeing and Kayaking**

★3 (fi 6) (Spring/Summer, 0-2s-4). The theory and practice of canoeing and kayaking instruction and trip leadership appropriate for various populations. Opportunities may be given to attempt ARCA/Red Cross and CRCA certification. Equipment is available from the Campus Outdoor Centre. Prerequisite: PAC 180 or consent of Faculty.

**L PAC 381 Analysis, Instruction, and Leadership of Cross Country Skiing**

★3 (fi 6) (second term, 0-2s-4). The theory and practice of nordic ski instruction and trip leadership including avalanche safety training. Opportunities may be given to attempt CANSI Ski Instructor and CSA Tour Leader certification. Note: A five-day required ski tour will normally be scheduled during Reading Week. Equipment is available from the Campus Outdoor Centre. Prerequisite: PAC 181 or consent of Faculty.

**L PAC 390 Applied Resistance Training**

★3 (fi 6) (either term, 2-0-1). 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 200. Pre- or corequisite: PEDS 335.

**L PAC 399 Physical Activity - Level II**

★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.

## 201.173 Physical Education and Sport, PEDS

Faculty of Physical Education and Recreation

### Undergraduate Courses

**Note:** See also INT D 304 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.

**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. For BPE students only.

**PEDS 102 Human Physiology**

★6 (fi 12) (two term, 3-0-0; 3-0-1). Introduction to human physiology from the cellular to systemic level, with special emphasis on systems which adapt to exercise stress. For BPE students only.

**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 102 or equivalent. For BPE students only.

**PEDS 201 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.

**PEDS 202 Leadership and Instruction in Physical Activity**

★3 (fi 6) (either term, 2-0-2). An introduction to the theory and practice of leadership and instruction in physical activity settings. Instructional techniques are applied to a variety of activities and environments in order to enhance the development of instructional skills which can promote skill learning. For BPE students only.

**PEDS 203 Skill Acquisition and Performance**

★3 (fi 6) (either term, 3-0-0). The course presents psychological approach to understanding human motor behavior. The course will examine the processes involved in learning motor skills and controlling movement, and the factors that influence acquisition and performance. For BPE students only.

**PEDS 205 Introduction to Outdoor Environmental Education**

★3 (fi 6) (either term, 3-0-3). A conceptual and experiential introduction to outdoor environmental education and leadership. In addition to weekly lecture and lab components, the course includes weekend commitments. This course requires the payment of additional miscellaneous fees. See §22.2.3 for details.

**PEDS 206 Biomechanics**

★3 (fi 6) (first 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. For BPE students only.

**PEDS 240 Introduction to Sports Injuries**

★3 (fi 6) (either term, 3-0-1.5). 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. Prerequisite: PEDS 100 or equivalent.

**PEDS 292 Introduction to the Movement Activities of Children Aged 0-8**

★3 (fi 6) (either term, 0-3s-0). A study of free play and organized physical activities of young children in recreational, educational, and sports environments. Class members will engage in practical physical activity and the observation of children. This course is not open to students who have received credit for PEDS 293 or equivalent.

**PEDS 293 Introduction to the Movement Activities of Children Aged 5-12**

★3 (fi 6) (either term, 0-3s-0). A study of free play and organized physical activities of school age children in recreational, educational, and sport environments. Class members engage in practical physical activity and the observation of children. This course is not open to students who have received credit for PEDS 292 or equivalent.

**PEDS 294 A Conceptual Approach to Physical Activity**

★3 (fi 6) (either term, 1-2s-0). A study of the fundamental movement concepts that underlie the physical activities engaged in by youth of secondary school age. For BPE and BEd (Physical Education Majors/Minors only.)

**PEDS 302 Human Motor Control**

★3 (fi 6) (either term, 3-0-0). The course will present a multi-level approach that will focus upon the neural and behavioral foundations underlying the control of movement. Prerequisite: PEDS 203 or consent of Faculty.

**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. Prerequisite: PSYCO 104 (for non-BPE students), BPE students must successfully complete the first two years of the BPE degree.

**PEDS 305 Adventure Education Leadership**

★3 (fi 6) (Spring/Summer, 0-3s-3). Principles and practice of wilderness travel with an emphasis on personal group development through outdoor pursuits. Technical skill development in navigation, rock climbing, minimal impact travel, survival and rescue, and rescue. This course requires the payment of additional miscellaneous fees. See §22.2.3 for details. Prerequisite: PEDS 205.

**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 or consent of Faculty.

**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. For BPE, Secondary PE Majors, and BPE/BEd students only.

**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. For BPE students only. Students cannot receive credit for PEDS 309 if they received credit for PSYCO 211 or SOC 210 or STAT 141 or STAT 151.

**PEDS 330 Dimensions of Physical Activity Performance**

★3 (fi 6) (either term, 3-0-0). This course introduces the integrated nature of physical activity performance with emphasis on the biological, psychological, and motor skill dimensions. Skills in observation, evaluation, prescription, and intervention will be introduced and developed through problem solving techniques.

**PEDS 334 Body Composition 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. Prerequisites: PEDS 200 (no concurrent registration). For BPE students only.

**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 or consent of Faculty.

**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. For BPE and BA (Recreation Administration) students only.

**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. This course is inclusive of the content of the NCC Program (Theory Levels I and II).

**PEDS 384 Educational Gerontology in Physical Activity, Fitness, and Sport**

★3 (fi 6) (either term, 1.5-0-1.5). The study and practical application of the principles of educational gerontology. This course will involve students in the analysis and instruction of older adults in a variety of sport, fitness, and physical activity settings. Focus will be on the issues and challenges of instruction in two populations: (1) aged, frail adults and (2) elderly, athletic adults.

**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. Not for BPE degree credit. For BA (Recreational Administration) and BEd students only.

**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 will 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. For BPE students only. Prerequisite: PEDS 100.

**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 or consent of Faculty.

**PEDS 405 Outdoor Environmental Leadership**

★3 (fi 6) (either term, 3-0-3). Principles, methods, and supervised practice of outdoor environmental education, environmental philosophy, and issues investigation and action as relevant to those leading and/or participating in the natural environment. Prerequisite: PEDS 205.

**PEDS 407 Philosophy of Physical Education and Sport**

★3 (fi 6) (either term, 3-0-0). Emphasis on developing the ability to philosophically evaluate the conceptual issues encountered when physical education and sport are discussed. Prerequisite: PERLS 104. For BPE students only.

**0 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 an introductory statistics course.

**PEDS 412 Advanced Exercise Physiology**

★3 (*fi 6*) (either term, 3-0-0). This course will cover acute and chronic response to exercise through an increased understanding of the mechanisms and adaptations that occur within the human body. Different sport modalities, different populations or different disease states may also be presented to explore the science of exercise. Prerequisites: PEDS 200, PEDS 309 (these may not be taken as corequisites).

**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, or consent of Faculty.

**PEDS 444 Helping Skills and Strategies in Sport and Physical Activity**

★3 (*fi 6*) (either term, 1.5-1.5s-0). This course will present the student with counselling theories and helping skills as they relate to a variety of populations in sport and physical activity settings. Time will be spent in the seminar format developing individual and group skills. Prerequisites: PEDS 303 or consent of Faculty. Prerequisite or Corequisite: PEDS 403.

**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 and PERLS 370.

**PEDS 484 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.

**PEDS 490 Professional Practicum**

★6 (*fi 12*) (variable, variable). A half-time Professional Practicum that may run for the full term for 20 hours per week, the full session for 10 hours per week, or the equivalent time. Students must apply to the Practicum Supervisor. A limited number of placements are available. Restricted to Year 4 BPE students only. 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*) (either term, 14 weeks). 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. Restricted to Year 4 BPE students only. Students will not be allowed to register in any other course in conjunction with PEDS 491 unless approved by the Practicum Supervisor.

**PEDS 492 Movement Education for Young Children**

★3 (*fi 6*) (either term, 0-3s-0). A study of the functional aspects of movement involved in the activities of children from infancy to age eight. Included is an examination of play equipment and play spaces. Prerequisite: PEDS 292 or consent of Faculty.

**PEDS 497 Selected Topics in Physical Education and Sport**

★3 (*fi 6*) (variable, variable). A course offered on a topic of current interest in physical education and sport. Refer to the Registration Procedures Book for information on specific sections. Prerequisite: consent of Faculty.

**PEDS 499 Directed Studies**

★3 (*fi 6*) (variable, 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 510 Anthropometry and Physical Activity**

★3 (*fi 6*) (either term, 1-2s-0). An examination of current research in anthropometry and body composition with special emphasis on eating disorders, obesity, and weight control.

**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 515 Exercise Physiology Laboratory Techniques**

★3 (*fi 6*) (either term, 1-0-3). The study of theoretical and practical issues related to selected laboratory techniques.

**PEDS 516 Muscle: Exercise and Training**

★3 (*fi 6*) (either term, 0-3L-0). This course will examine the developmental, morphological and metabolic properties of skeletal muscle and the way in which skeletal muscle adapts to acute and chronic exercise.

**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 520 Physical Growth and Development**

★3 (*fi 6*) (either term, 0-3s-0). An examination of selected topics in physical growth and motor development from both a theoretical and applied perspective.

**PEDS 530 Adapted Physical Activity**

★3 (*fi 6*) (second 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 550 The Administration of Amateur Sport: The Role of the Canadian State**

★3 (*fi 6*) (either term, 0-3s-0). This course will examine the increasingly large and visible role played by the state in Canadian Sport.

**PEDS 577 Sport and Ethics**

★3 (*fi 6*) (either term, 0-3s-0). An examination of ethical problems in sport. Prerequisite: PEDS 201 or PEDS 407 or consent of Department.

**PEDS 580 The Nature of Scientific Inquiry in Physical Education and Sport Studies**

★3 (*fi 6*) (first term, 0-3s-0). An introduction to the basic philosophy and nature of scientific inquiry as it applies to contemporary research.

**PEDS 610 Seminar in Exercise Physiology**

★3 (*fi 6*) (second term, 0-3s-0). Prerequisite: consent of Faculty.

**PEDS 642 Advanced Seminar in the Psychology of Sport and Physical Activity**

★3 (*fi 6*) (either term, 0-3s-0). An advanced study of the research and theories pertaining to a specialized topic area within the psychology of sport and physical activity.

**201.174 Physical Education, Recreation and Leisure Studies, PERLS**

Faculty of Physical Education and Recreation

**Undergraduate Courses****PERLS 101 Developing Critical Thinking in Physical Education and Recreation**

★3 (*fi 6*) (either term, 1.5-0-1.5). Introduction to the skills and attitudes of critical thinking. Focus on the elements of reasoning and intellectual standards for assessing thinking. Specific attention to improving critical reading, writing, and listening. The course intends to empower students to be independent, responsible learners during their undergraduate program and beyond. For students in the Faculty of Physical Education and Recreation only.

**PERLS 104 Introduction to Sociocultural Aspects of Leisure and Sport**

★3 (*fi 6*) (either term, 3-0-0). 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 Administration of Sport, Physical Activity and Recreation Programs**

★3 (*fi 6*) (either term, 3-0-1). This course provides students with the basic skills required to successfully administer a sport and/or recreation program. For Faculty of Physical Education and Recreation students and BED/PE majors or consent of Faculty. Note: Not open to students with credit in PEDS 105.

**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 or consent of Faculty.

**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 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 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 SOC 210 (or equivalent).

**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. This course requires the payment of additional miscellaneous fees. See §22.2.3 for details.

**Graduate Courses****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.

**PERLS 542 Social Science Perspectives of Physical Activity, Fitness, and Well-Being**

★3 (fi 6) (either term, 0-3s-0). An examination of the antecedents and consequences of regular vigorous physical activity involvement. Although a holistic interdisciplinary perspective will be adopted, emphasis will be placed upon social psychological models and methodologies. Attention will be given to a variety of approaches for fostering regular physical activity involvement, ranging from those with a specific individual focus (e.g. individual counselling interventions) to those with a general societal orientation (e.g. general mass media or public education interventions).

**PERLS 544 Aging, Health and Active Living**

★3 (fi 6) (either term, 0-3s-0). An exploration of the benefits and risks of late-life physical activity, as well as life course barriers and incentives to health promotion through active living. The course will examine theoretical explanations for sedentary leisure of older adults through a critical review of the interdisciplinary gerontological literature.

**PERLS 551 Analysis of Sport and Leisure Organizations**

★3 (fi 6) (either term, 0-3s-0). An examination of the role, structure and processes of voluntary sport and leisure organizations. Note: May not be taken for credit if credit has been granted for PESS 551 or RLS 500.

**PERLS 552 Leadership and Organizational Development as Applied to Physical Education, Sport, Recreation, and Leisure Organizations**

★3 (fi 6) (either term, 0-3s-0). The purpose of the course is to explore and analyze proven leadership practices and strategies in organizations and to relate this theoretical and practical material to physical education, sport, recreation and leisure organizations. The course is experiential and self-explorative as

students are expected to assess past and present leadership experiences and identify possible future leadership practices.

**PERLS 581 Social Research Applications to Leisure and Sport**

★3 (fi 6) (first 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) (first term, 0-3s-0).

**PERLS 591 Research and Directed Studies II**

★3 (fi 6) (second term, 0-3s-0).

**PERLS 599 Directed Studies and Research**

★3 (fi 6) (two term, 0-1.5s-0).

**PERLS 690 Directed Studies and Research**

★3 (fi 6) (first term, 0-3s-0).

**PERLS 691 Directed Studies and Research**

★3 (fi 6) (second 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.

**201.175 Physical Therapy, PHER**

Department of Physical Therapy  
Faculty of Rehabilitation Medicine

Note: All PHER courses are open to PT students only.

**Undergraduate Courses****PTHER 100 Professional Development I**

★1 (fi 2) (first term, 3 days). Credit. Introduction to the physical therapy program and learning skills needed for university and the profession.

**PTHER 201 Introduction to Clinical Practice**

★1.5 (fi 3) (either term, 1 week). Credit. Introduction to clinical practice in approved clinical affiliations. Corequisites: REHAB 290, 295. Prerequisite: PHER 100.

**PTHER 300 Professional Development III**

★1 (fi 2) (either term, 1-0-0). Credit. This course will address organizational aspects of physical therapy practice and ethical issues as they apply to physical therapy.

**PTHER 310 Scientific Basis of Athletic Injuries**

★3 (fi 6) (either term, 2-0-1). An introduction to the theory and assessment of selected orthopaedic conditions which may be encountered by athletic therapists and physical educators (for senior BPE students). Prerequisites: PEDS 100 and 240.

**PTHER 311 Biomechanics in Physical Therapy**

★3 (fi 6) (either term, 1.5-0-1.5). Dynamics and statics of human movement with application to physical therapy. Emphasis on integration of mechanical analysis with the practice of physical therapy. Prerequisites: REHAB 282, 283.

**PTHER 321 Electrophysical Agents I**

★3 (fi 6) (either term, 3-0-2). Theory and practice of use and application of therapeutic heat, cold, light, ultrasound, and massage as used in physical therapy. Prerequisites: PHER 311, REHAB 283, 285, 290, 295, and PHYSL 161.

**PTHER 322 Electrophysical Agents II**

★3 (fi 6) (either term, 3-0-2). Theory and practice of the use and application of therapeutic electric currents, basic electrophysiologic testing, and EMG biofeedback as used in physical therapy. Prerequisite: PHER 321.

**PTHER 371 Introduction to Paediatrics in Physical Therapy**

★3 (fi 6) (either term, 3-0-1.5). The study of child development and application of physical therapy theory and research in paediatric neurology. Prerequisites: REHAB 285, 290, 295, 351, and PHYSL 161.

**PTHER 374 Neurological Physical Therapy I**

★3 (fi 6) (either term, 3-0-2). An introduction to common problems seen in adult neurology, using Stroke as a representative model, and the study of the physical therapy theory and research related to the assessment and management of these problems spanning physical, psychosocial, cultural, and environmental domains. Prerequisites: PHER 371, REHAB 351, 353, and 354.

**PTHER 375 Neuromuscular Physical Therapy II**

★3 (fi 6) (either term, 0-2s-2). A study of the physical therapy assessment and management of selected neurological conditions including critical appraisal of the related research in neuroscience and rehabilitation. Prerequisites: PTH 374, REHAB 353.

**PTHER 380 Cardiorespiratory Physical Therapy**

★3 (fi 6) (either term, 3-0-2). An introductory study of the pathology and management of representative conditions affecting the cardiac and respiratory systems. Prerequisites: REHAB 352, 283, 285, 290, 295 and PHYSL 161.

**PTHER 384 Neuromusculoskeletal Disorders and Assessment**

★4 (fi 6) (either term, 3-0-3). The study of conditions affecting the musculoskeletal and peripheral nervous systems encountered by physical therapists and methods of physical therapy assessment and diagnosis. Prerequisites: PTH 311, REHAB 283, 285, 290, 295, and PHYSL 161.

**PTHER 385 Mobilization of Peripheral and Spinal Joints**

★3 (fi 6) (either term, 1-0-2). An introduction to the treatment of peripheral and vertebral joints using selected mobilization techniques. Prerequisites: PTH 384, 396.

**PTHER 387 Seminar in Therapeutics**

★3 (fi 6) (either term, 0-2s-0). A seminar series designed to integrate therapeutic treatments in physical therapy, including a critical review of the clinical and research literature. Prerequisites: PTH 380, 322, 384, 396, 375, REHAB 463.

**PTHER 395 Therapeutic Exercise I**

★3 (fi 6) (either term, 2-0-2). The role of therapeutic exercise in the management of neuromuscular and neuromusculoskeletal conditions. Corequisite: REHAB 352. Prerequisites: PTH 311, 384, and REHAB 353.

**PTHER 396 Therapeutic Exercise II**

★3 (fi 6) (either term, 1-0-3). Principles of therapeutic exercise and their application to special populations, including theoretical basis of exercise as a therapeutic modality, exercise prescription, and evaluation of exercise effects. Prerequisites: PTH 395, REHAB 352.

**PTHER 421 Neuromuscular Clinical Practice**

★3 (fi 6) (either term, 5 weeks). Credit. Clinical practice with clients with problems affecting the neuromuscular system. Prerequisite: PTH 374.

**PTHER 423 Cardiorespiratory Clinical Practice**

★3 (fi 6) (either term or Spring/Summer, 5 weeks). Credit. Clinical practice with clients with problems affecting the cardiovascular and/or respiratory systems. Prerequisite: PTH 380.

**PTHER 426 Neuromusculoskeletal Clinical Practice**

★3 (fi 6) (either term or Spring/Summer, 5 weeks). Credit. Clinical practice with clients with problems affecting the neuromusculoskeletal system. Prerequisites: PTH 322, 384, and 395.

**PTHER 428 Clinical Practice IV**

★3 (fi 6) (either term or Spring/Summer, 5 weeks). Credit. Clinical practice in approved clinical affiliations.

**PTHER 431 Clinical Practice VI**

★3 (fi 6) (either term, 5 weeks). Credit. Clinical practice in approved clinical affiliations.

**PTHER 433 Clinical Practice VII**

★3 (fi 6) (either term, 5 weeks). Credit. Clinical practice in approved clinical affiliations.

**PTHER 452 Selected Clinical Practice**

★3 (fi 6) (two term, variable).

**PTHER 466 Individual Study/Special Subject**

★1-12 (variable) (either term, 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 467 Individual Study**

★3 (fi 6) (either term, 3-0-0). 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 work or clinical experience. Prerequisite: consent of Department.

**PTHER 468 Sports Therapy**

★3 (fi 6) (either term, 3-0-2). An introduction to the prevention and care of sports injuries including the adaptation of therapeutic exercise to the highly trained individual. Prerequisite: consent of Instructor.

**PTHER 472 Paediatrics and the Physical Therapist**

★3 (fi 6) (either term, 0-3L-0). Physical Therapy applied to the care of the paediatric patient in the home and in the institution.

**PTHER 480 Respiratory Conditions**

★3 (fi 6) (either term, 0-3L-0). An advanced course in the pathophysiology, assessment and treatment of patients with respiratory conditions.

**PTHER 485 Advanced Manual Therapy for Peripheral and Vertebral Joints**

★3 (fi 6) (either term, 1-1s-1). Lectures, critical discussion and practice in the

use and application of selected mobilization and manipulation techniques used in the treatment of peripheral and vertebral joint dysfunction. Prerequisite: PTH 385.

**PTHER 490 Measurement and Technology in Rehabilitation**

★3 (fi 6) (either term, 2-1s-2). The principles involved in measurement, evaluation and assistive technology and their application to practice in rehabilitation. This course will include measurement of physical impairment, disability and handicap, and assistive technologies for seating and positioning, mobility, computer access and environmental control. Prerequisite: PTH 375 or consent of Instructor.

**PTHER 495 Medicine and Surgery**

★3 (fi 6) (either term, 2-1s-0). The study of selected cynical problems, their underlying conditions and physical therapy management. Prerequisites: REHAB 283, REHAB 285, REHAB 295, PHYSL 161.

**Graduate Courses****PTHER 505 Motor Control Mechanisms in Health and Disease**

★3 (fi 6) (either term, 2-1s-0). Introduction to the neural mechanisms of motor control and disturbances of these mechanisms in disease states. Emphasis will be placed on topics of clinical importance. Prerequisites: REHAB 353 (Neuroscience for Rehabilitation) or equivalent, and approval of the instructor and the student's advisor.

**PTHER 506 Electromyographic Kinesiology**

★3 (fi 6) (either term, 1-0-2). Seminar and laboratory sessions on advances in electromyography applied to physical therapy and allied areas.

**PTHER 507 Instrumentation in Physical Therapy**

★3 (fi 6) (either term, 2-0-2). A course on electronic fundamentals applied to measuring instruments and their basic components as used in physical therapy research.

**PTHER 509 Tissue Biomechanics**

★3 (fi 6) (either term, 1-2s-0). A consideration of the mechanical properties of biological tissue in normal and selected pathological conditions.

**PTHER 510 Rehabilitation Ergonomics**

★3 (fi 6) (either term, 1-2s-0). The application of ergonomic principles in rehabilitation.

**PTHER 514 Readings in Rheumatology for Physical Therapists**

★3 (fi 6) (either term, 0-3s-0). Reading course on selected issues in rheumatology for the graduate physical therapist.

**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 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 550 Physiological Basis of Neuromuscular Disorders**

★3 (fi 6) (either term, 2-1s-0). Cellular basis of clinically relevant perturbations to the neuromuscular system. Particular reference will be made to the efficacy of rehabilitative interventions.

**PTHER 564 Recent Advances in Orthopaedics**

★3 (fi 6) (either term, 0-3s-0). A seminar of recent advances in medical and surgical techniques in rheumatology and orthopaedics.

**PTHER 568 Advanced Sports Therapy**

★3 (fi 6) (either term, 0-3s-0). Seminar on advances in sports therapy and other related topics.

**PTHER 570 Measurement and Evaluation in Physical Therapy**

★3 (fi 6) (either term, 2-0-3). The principles involved in measurement and evaluation and their application in the practice of physical therapy.

**PTHER 571 Issues in Paediatrics**

★3 (fi 6) (either term, 0-3s-0). A seminar course evaluating theoretical frameworks and intervention strategies used in paediatric physical therapy.

**201.176 Physics, PHYS**

Department of Physics  
Faculty of Science

**Notes**

- (1) Credit may be obtained in only one of PHYS 101, 102, 103, 105, 108, 141, or EN PH 131.
- (2) Credit may be obtained in only one of PHYS 100, 109, or 130.
- (3) Students who have previously taken courses labelled PHYS 103, 104, 105, 106, 137, 141, or 143 should consult the Department of Physics regarding further Physics courses in their programs.
- (4) Credit may be obtained in only one of PHYS 201, 204, 230, 238, 281, or 285.
- (5) Credit may be obtained for only one of PHYS 200, 251, or 351.
- (6) Credit may be obtained for only one of PHYS 208 or 271.
- (7) Credit may be obtained for only one of ASTRO 110 or 120.
- (8) Credit may be obtained for only one of ASTRO 110 or 122.
- (9) Credit may be obtained for only one of PHYS 202 or 212.
- (10) Credit may be obtained for only one of PHYS 202 or 213.
- (11) Also see Astronomy (ASTRO) and Geophysics (GEOPH) listings for other courses offered by the Department of Physics.

**Undergraduate Courses****PHYS 100 General Physics I**

★3 (fi 6) (first term, 3-0-3). The physics of oscillations and wave motion, application to sound and light waves; physics of fluids; geometrical optics and basic optical instruments; wave optics, uses of interferometry. Prerequisites: Physics 30, Pure Mathematics 30. Credit may normally be obtained for only one of PHYS 100, 109, 130.

**PHYS 101 General Physics II**

★3 (fi 6) (second term, 3-0-3). Linear and rotational dynamics, work and energy, gravitation, momentum and collisions, rigid body rotation, statics, kinetic theory, heat, and thermodynamics. Prerequisite: PHYS 100. Credit may be obtained for only one of PHYS 101, 102, 103, 105, 108, 141, or EN PH 131.

**PHYS 102 Mechanics**

★3 (fi 6) (second term, 3-0-3). A calculus based mechanics course; vectors, kinematics, Newton's Laws, work, and energy; potential energy, conservation of energy; linear momentum, angular momentum, and conservation; moment of inertia, rigid body motion; simple harmonic motion; damped and driven oscillations; gravitation. Intended for BSc Honors and Specialization students. Prerequisites: MATH 113, 114, or 117 and PHYS 100. Credit may be obtained in only one of PHYS 101, 102, 103, 105, 108, 141, or EN PH 131.

**PHYS 108 Introduction to University Physics I**

★3 (fi 6) (first term, 3-1.5s-3). A non-calculus course for students without Physics 30. Vectors, forces in equilibrium, linear and rotational motion, dynamics of particles, oscillations. Prerequisite: Pure Mathematics 30. This course is intended to be taken in sequence with PHYS 109. Not available to students with Physics 30 unless by prior written consent from the Department of Physics. Credit may be obtained for only one of PHYS 101, 102, 103, 105, 108, 141, or EN PH 131.

**PHYS 109 Introduction to University Physics II**

★3 (fi 6) (second term, 3-1.5s-3). A non-calculus course in physics for students without Physics 30, to be taken in sequence with PHYS 108. Waves, sound, fluids, geometrical, and physical optics, heat, and thermodynamics. Prerequisite: PHYS 103 or 108. Credit may normally be obtained for only one of PHYS 100, 109, 130.

**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, Mathematics 31, Physics 30. Corequisite: MATH 100 or equivalent. Restricted to Engineering students. (★3)

**PHYS 200 Relativistic Aspects of Modern Physics**

★3 (fi 6) (second term, 3-0-0). Topics included are limitations of classical physics; Einstein's special theory; length contraction; time dilation; twin paradox; equivalence of mass and energy; relativistic mass and momentum; the General Theory of Relativity including deflection of light, black holes, models of the universe, and curvature of space. Prerequisite: First year physics course(s) (two-term). Pre- or corequisite: MATH 113 or 114. Credit may be obtained in only one of PHYS 200, 251, or 351. Note: This course is not available for credit toward Honors or Specialization Physics and Mathematical Physics degree programs.

**PHYS 201 General Physics III**

★3 (fi 6) (first term, 3-0-3). Electrostatics; principles and applications, the Bohr

atom; DC and AC circuits; magnetism and electromagnetic induction; electric motors and power generation; electromagnetic waves and lasers; wave-particle duality and electron waves. Prerequisites: PHYS 101 or 102 or 109 or EN PH 131, and MATH 113 or 114. This course is part of a sequence with PHYS 100 and 101 (or PHYS 108 and 109) for General Program students. Credit may normally be obtained in only one of PHYS 201 or 281.

**PHYS 208 Quantum Aspects of Modern Physics**

★3 (fi 6) (second term, 3-0-0). Experimental evidence leading to the development of quantum mechanics including the photo-electric effect, the Compton effect, X-ray production and electron diffraction; a discussion of the Heisenberg uncertainty principle and the Schrodinger theory of quantum mechanics including applications of one dimensional potential wells and barriers; tunnelling; the simple harmonic oscillator. Prerequisites: PHYS 101 or 109, and MATH 113 or 114. Credit may be obtained in only one of PHYS 208 or 271.

**PHYS 211 Thermodynamics and Kinetic Theory**

★3 (fi 6) (second 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 102 or EN PH 131. Pre- or corequisite: MATH 215 or 317 or equivalent.

**PHYS 212 Revolutions in Physics: The Structure of the Universe**

★3 (fi 6) (first term, 3-0-0). This course traces the conceptual development of our understanding of the structure of the physical universe from Babylonian astronomy up to Einstein's Theory of Relativity, and its application to cosmology. Prerequisite: PHYS 100 or PHYS 109. Note: Credit may be obtained for only one of PHYS 202 or PHYS 212.

**PHYS 213 Revolutions in Physics: The Quantum Theory of Matter**

★3 (fi 6) (second term, 3-0-0). This course traces the evolution of theories of matter, the limitations of classical causality, and the development and interpretations of Quantum Mechanics including implications for exciting current topics in Physics. Prerequisite: PHYS 100 or PHYS 109. Note: Credit may be obtained for only one of PHYS 202 or PHYS 213.

**PHYS 230 Electricity and Magnetism**

★3 (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 and MATH 100. Corequisite: MATH 101 or 115. Note: Restricted to Engineering students.

**PHYS 244 Mechanics**

★3 (fi 6) (second 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 102 or EN PH 131. Corequisite: MATH 215 or 317 or equivalent.

**PHYS 261 Physics of Energy**

★3 (fi 6) (first term, 3-0-0). Energy in its various forms; conservation of energy principle; consumption of primary energy by various countries; space heating, RSI, heating degree-days; hydro, tidal, and wind power; ideal gases; heat engines, refrigerators and the second law of thermodynamics; nuclear fission, nuclear reactors. Prerequisites: First year Physics course(s) (two-term) and MATH 113 or 114, plus one other mathematics course.

**PHYS 264 Environmental Physics I**

★3 (fi 6) (second term, 3-0-0). Principles of materials balance and the calculation of the concentration of pollutants; exponential growth and decay; consumption of resources; thermal conduction, convection and radiation; solar energy and solar technology; photovoltaics; water vapor and humidity. Prerequisites: First year physics courses (two-term) and MATH 113 or 114, plus one other mathematics course.

**PHYS 271 Introduction to Modern Physics**

★3 (fi 6) (either term, 3-0-0). Experimental evidence for limitations of classical physics: photoelectric effect, Franck-Hertz experiment, Davisson-Germer experiment, Compton effect, Stern-Gerlach experiment, atomic spectra; wave-particle duality, de Broglie relation, wave theory, Bohr atom, Schrödinger equation and application to simple problems in one dimension; Pauli exclusion principle, periodic table, electrons in metals. Prerequisite: PHYS 102, 137, or 143 or EN PH 131, and MATH 115 or equivalent. Note: Credit may be obtained in only one of PHYS 208 or 271.

**PHYS 281 Electricity and Magnetism**

★3 (fi 6) (first 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 102. Corequisite: MATH 214 or 217 or equivalent.

**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 214 or equivalent. Note: Restricted to Engineering students. (★3)



**PHYS 294 General Physics Laboratory**

★3 (fi 6) (first term, 0-0-6). Introduction to methods of experimental physics with examples from modern physics. Prerequisites: PHYS 201 and MATH 113. 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) (first 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 101 or 102, and MATH 115. Credit may be obtained in only one of PHYS 294 or 295.

**PHYS 297 Classic Experiments in Physics**

★3 (fi 6) (first 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, and 281, and MATH 115.

**PHYS 301 Nuclear Physics and Elementary Particles**

★3 (fi 6) (first term, 3-0-0). Topics include the properties and structure of the nucleus; radioactivity, carbon dating, tracer techniques; nuclear fission; fusion; nuclear reactors; elementary particles and particle accelerators. Prerequisites: PHYS 201 and 208. Corequisite: MATH 214. Note: This course is not available for credit toward Honors Physics and Mathematical Physics degree programs.

**PHYS 302 Atomic Molecular and Laser Physics**

★3 (fi 6) (second term, 3-0-0). The Rutherford Model of the atom; the Balmer series in hydrogen; the Bohr model; the wave-mechanical model; electron spin; the Pauli exclusion principle and X-ray spectra; molecular bonding; experimental and theoretical aspects of molecular structure; vibrational and rotational spectra of simple molecules; requirements for laser action; population inversion mechanisms; applications of lasers. Prerequisites: PHYS 201 and 208, and MATH 214. Note: This course is not available for credit toward Honors Physics and Mathematical Physics degree programs.

**PHYS 307 Solid State and Materials Physics**

★3 (fi 6) (second term, 3-0-0). Crystal structure, diffraction and atomic binding; structural defects; electrons in metals; energy bands; semiconductors, p-n junctions and transistors; low temperature physics; superconductivity; magnetic materials; applications to data storage, integrated circuits, lasers, and other devices. Prerequisites: PHYS 201 and 208, and MATH 115. Note: This course is not available for credit toward Honors Physics and Mathematical Physics degree programs.

**PHYS 309 Statistical Physics with Biological Applications**

★3 (fi 6) (first term, 3-0-0). Elements of probability theory with applications; molecular motion and physical properties of gases; random walk in one and three dimensions with application to diffusion and solute flow across boundaries; the diffusion equation; particle conservation; Fick's Law; porous membranes; flow and diffusion of particles; Poisson statistics applied to physical and biological systems. Prerequisite: PHYS 201 or 204. Note: This course is not available for credit toward Honors Physics and Mathematical Physics degree programs.

**PHYS 311 Statistical Physics I**

★3 (fi 6) (first 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, 271 and MATH 215 or 317 or equivalent.

**PHYS 319 Physical Principles of Electron Microscopy**

★3 (fi 6) (second term, 3-0-0). Application of the basic principles of optics, electricity, and magnetism to the focusing of electron beams and to the design of transmission and scanning electron microscopes; electron scattering by atoms; electron diffraction; interpretation of images of biological and crystalline specimens; microanalysis by X-ray emission spectroscopy. Prerequisite: PHYS 201 or 204.

**PHYS 351 Relativity**

★3 (fi 6) (either term, 3-0-0). Lorentz transformations, definition of scalars, vectors, tensors; transformation of electromagnetic field; relativistic kinematics-collisions, centre of momentum, and laboratory frames; applications; introduction to general relativity. Prerequisites: PHYS 244, and 281 or 285, and MATH 215. Credit may be obtained for only one of PHYS 200, 251, or 351.

**PHYS 362 Optics**

★3 (fi 6) (first term, 3-0-0). Gaussian optics; optical instruments; matrix analysis of lens systems; aberrations; polarization; double- and multiple-beam interference; Fraunhofer and Fresnel diffraction; selected topics from contemporary optics. Prerequisite: PHYS 230 or 238 or 281 or 285, and MATH 215. For Engineering students, EE 335 is a corequisite in place of MATH 215.

**PHYS 364 Environmental Physics II**

★3 (fi 6) (first term, 3-0-0). Terrestrial thermal environment; molecular absorption of electromagnetic radiation and the carbon dioxide problem; factors affecting the long-term stability of the earth's climate; wet and dry adiabatic lapse rates

and the dispersal of air pollutants; the ozone problem; the physics of air movement and the ventilation of buildings; radioactivity and the effect of ionizing radiation on humans, the radon problem. Prerequisites: PHYS 264 and MATH 115.

**PHYS 372 Quantum Mechanics A**

★3 (fi 6) (second 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, and PHYS 230 or 238 or 281 or 285 and MATH 121 (or 102 for Engineering students). Corequisite: MATH 337 or equivalent.

**PHYS 381 Electromagnetic Theory I**

★3 (fi 6) (second term, 3-0-0). Gradient, divergence, curl; curvilinear coordinates; Dirac delta function; electrostatics; conductors, capacitors; Laplace's equation, boundary value problems; method images; dielectrics, polarization, and displacement. Prerequisite: PHYS 230 or 238 or 281 or 285. Corequisite: MATH 337 or equivalent.

**PHYS 395 Instrumentation and Electronics**

★3 (fi 6) (first term, 3-0-3). Amplification, feedback and switching; examples will be taken from analog and digital computer applications. Prerequisites: PHYS 230 or 238 or 281 or 285, and PHYS 290 or 292 or 294 or 295.

**PHYS 397 Projects in Experimental Physics**

★3 (fi 6) (either term, 0-0-6). Projects in optics, electricity magnetism, and modern physics. Prerequisite: PHYS 290 or 292 or 295 or 297. Corequisite: PHYS 381 and MATH 337 or equivalent.

**PHYS 400 Industrial Internship Practicum**

★3 (fi 6) (first 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 1 to 9 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 423.

**PHYS 413 Statistical Physics II**

★3 (fi 6) (second term, 3-0-0). Grand canonical ensemble; quantum statistical mechanics. Fermi-Dirac and Bose-Einstein distributions; Bose-Einstein condensation; kinetic theory, transport coefficients, and the Boltzmann equation; fluctuations; phase transitions and critical phenomena. Prerequisites: PHYS 311 and 372, and MATH 337 or equivalent.

**PHYS 415 Introduction to Condensed Matter Physics I**

★3 (fi 6) (first 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 equivalent.

**PHYS 417 Introduction to Condensed Matter Physics II**

★3 (fi 6) (second term, 3-0-0). Lattice imperfections, dislocations, crystal growth; first and second order phase transitions; ferro- and antiferro-magnetism; production of low temperatures; superconductivity and superfluidity; dielectric and optical properties of solids; ferro-electricity. Prerequisites: PHYS 415 and MATH 337 or equivalent.

**PHYS 462 Atomic and Laser Spectroscopy**

★3 (fi 6) (either term, 3-0-0). Radiative transitions; hydrogenic fine-structure; two-electron systems; external fields; width and shape of spectral lines; radiative transfer; population inversion mechanisms; applications of lasers in atomic physics. Prerequisites: PHYS 472, and MATH 337 or equivalent.

**PHYS 465 Physics of Stellar Interiors**

★3 (fi 6) (either term, 3-0-0). Stellar interiors and nuclear transformation; model stars; variable stars; stellar evolution. Prerequisites: PHYS 271, and MATH 337 or equivalent.

**PHYS 472 Quantum Mechanics B**

★3 (fi 6) (first 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 equivalent, and MATH 311.

**PHYS 475 Medical Radiation Physics: Fundamentals**

★3 (fi 6) (either term, 3-0-0). Basic concepts of dosimetry; microscopic energy distribution in irradiated matter; production of X-rays; photon interactions; charged particle interactions; ionization cavity chambers. Prerequisite: PHYS 271, and 372 or 381.

**PHYS 477 Medical Radiation Physics: Radiotherapy Applications**

★3 (fi 6) (either term, 3-0-0). The physics of radiation therapy including photon and electron beams, brachytherapy, unsealed radionuclides, applied dosimetry, and treatment planning. Prerequisites: PHYS 475.

**PHYS 481 Electromagnetic Theory II**

★3 (fi 6) (first term, 3-0-0). Magnetostatics; Biot-Savart Law; Ampere's law;

vector potential; magnetic media; Faraday's law; self and mutual inductance; Maxwell's equations in free space and matter, gauges; Poynting vector, Maxwell's stress tensor; reflection and refraction of electromagnetic waves; transmission lines and wave guides. Prerequisites: PHYS 381, MATH 337 or equivalent, and MATH 311.

#### PHYS 484 Nuclear Physics

★3 (fi 6) (first term, 3-0-0). Nuclear forces and the two nucleon system. Bulk properties of nuclei. Nuclear excitation and decay. Shell and collective models of nuclear structure. Nuclear reactions and gamma and beta decay. Nuclear reactions in astrophysics. Prerequisites: PHYS 372 and MATH 337 or equivalent, and MATH 121 (or 102 for Engineering students).

#### PHYS 485 Introductory Particle Physics

★3 (fi 6) (second 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 472, PHYS 351, MATH 337 and MATH 121.

#### PHYS 491 Advanced Laboratory

★3 (fi 6) (first term, 0-0-6). Open-ended experiments in atomic, nuclear, and solid state physics. Prerequisites: PHYS 381 and 395. Corequisites: PHYS 481, and MATH 337 or equivalent.

#### PHYS 493 Instrumentation B

★3 (fi 6) (second term, 3-0-0). Topics in instrument design in several fields of experimental physics. Prerequisites: PHYS 397, 481 and MATH 337 or equivalent. (PHYS 395 is also strongly recommended as a prerequisite).

#### PHYS 499 Special Projects

★3 (fi 6) (second term, 0-0-6). Experimental or reading project under the direction of a staff member. This course is intended for both Honors Physics students and Honors Mathematical Physics students. Prerequisites: A 300-level Physics course and consent of Department.

## Graduate Courses

**Note:** The following undergraduate courses may be taken for credit by graduate students: PHYS 413, 415, 417, 445, 462, 465, 472, 475, 477, 481, 484, 485, 491, 493, 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 520 Classical Electrodynamics I

★3 (fi 6) (first term, 3-0-0). Boundary value problems in electrostatics, Green's functions, electrostatics in dielectrics; magnetostatics, time varying fields and Maxwell's equations, gauge transformations; plane electromagnetic waves.

#### PHYS 524 Classical Electrodynamics II

★3 (fi 6) (second 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 543 Condensed Matter Physics II

★3 (fi 6) (either term, 3-0-0). Dielectric and optical properties of solids; magnetism; electronic transport; disordered systems; electron-phonon interaction and superconductivity; strongly correlated electronic systems.

#### PHYS 572 Nuclear Forces and Few-Body Problems

★3 (fi 6) (either term, 3-0-0). The deuteron; the tensor force; nucleon-nucleon scattering; potential models; meson theory; fundamental symmetries; quark models; the nuclear three-body problem.

#### PHYS 574 Experimental Methods in Physics

★3 (fi 6) (either term, 3-0-3/2). Statistics and data analysis: S/N considerations; interactions of photons, neutrons, and charged particles with matter; detectors; vacuum technology. Other topics to be selected according to students' needs and instructor's preference.

#### 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 610 Quantum Field Theory I

★3 (fi 6) (first term, 3-0-0).

#### PHYS 614 Quantum Field Theory II

★3 (fi 6) (second term, 3-0-0).

#### PHYS 635 Statistical Theory of Plasmas

★3 (fi 6) (either term, 3-0-0).

#### PHYS 640 Solid State Theory

★3 (fi 6) (either term, 3-0-0).

#### PHYS 643 Superconductivity

★3 (fi 6) (either term, 3-0-0).

#### PHYS 644 Analytical Electron Microscopy

★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 649 Superfluids

★3 (fi 6) (either term, 3-0-0).

#### PHYS 673 Special Topics in Subatomic Physics I

★3 (fi 6) (either term, 3-0-0).

#### PHYS 675 Experimental Topics in Subatomic Physics II

★3 (fi 6) (either term, 3-0-0).

#### PHYS 691 Advanced Particle Physics I

★3 (fi 6) (either term, 3-0-0).

#### PHYS 692 Group Theory and Applications

★3 (fi 6) (either term, 3-0-0).

#### PHYS 693 Advanced Particle Physics II

★3 (fi 6) (either term, 3-0-0).

#### PHYS 695 Cosmology

★3 (fi 6) (either term, 3-0-0).

#### PHYS 696 Black Hole Physics

★3 (fi 6) (either term, 3-0-0).

#### PHYS 697 Quantum Cosmology

★3 (fi 6) (either term, 3-0-0).

#### PHYS 698 Quantum Fields in Curved Space

★3 (fi 6) (either term, 3-0-0).

#### PHYS 699 Special Topics in Theoretical Physics

★3 (fi 6) (either term, 3-0-0).

## 201.177 Physics/Biomedical Engineering, PH BE

Department of Biomedical Engineering, Faculty of Medicine and Dentistry; Department of Physics, Faculty of Science

### Undergraduate Courses

#### PH BE 221 Introduction to the Physics of Medicine and Biology

★3 (fi 6) (second term, 3-0-0). A non-calculus course that will review and illustrate by example various topics in physics applicable to medicine and biology. Examples will be drawn from skeletal mechanics; energy, metabolism, and heat loss; pressure and the physics of diving; fluid flow; osmosis and diffusion; physics of the lungs; physics of the cardiovascular system; origin of biopotentials, membrane and action potentials, and electrocardiography; sound and diagnostic ultrasound; vision and microscopy; biological effects of ionizing radiation, nuclear medicine, and diagnostic medical imaging. Prerequisites: PHYS 101, 102, or 109.

## 201.178 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

#### PHYSL 161 Elementary Physiology

★6 (fi 12) (two term, 3-0-1). Available only to students in the Faculty of Rehabilitation Medicine (Physical Therapy and Occupational Therapy) and the Medical Laboratory Science program in the Faculty of Medicine and Dentistry.

**PHYSL 162 Elementary Physiology**

★6 (fi 12) (two term, 3-0-0). Available only to students in the Faculty of Nursing.

**PHYSL 210 Mammalian and Human Physiology**

★6 (fi 12) (two term, 3-0-0). Introductory course in mammalian and human physiology. Prerequisites: BIOL 107 or 108; CHEM 101 and 102. Prerequisites or corequisites: CHEM 161 and 163; or CHEM 261 and 263. Credit may be obtained in only one of PHYSL 210 and 211.

**PHYSL 211 Mammalian and Human Physiology**

★6 (fi 12) (two term, 3-0-0). Introductory course in mammalian and human physiology. Required for students in Honors Physiology. Recommended for students in other Honors programs. Prerequisites: BIOL 107 or 108; CHEM 101 and 102. Prerequisites or corequisites: CHEM 161 and 163; or CHEM 261 and 263. Credit may be obtained in only one of PHYSL 210 and 211.

**PHYSL 252 Human Physiology**

★6 (fi 12) (two term, 3-0-0). An introductory course on mammalian and human physiology. Available only to students in the Faculties of Pharmacy and Pharmaceutical Science and Agriculture, Forestry, and Home Economics.

**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. Prerequisite: PHYSL 210 or 211, or ZOOL 242.

**PHYSL 401 Molecular and Cellular Physiology**

★3 (fi 6) (first 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. 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 210, or 211 and consent of Instructor.

**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, some theoretical modelling. Prerequisites: PHYSL 210, or 211 and consent of Instructor.

**PHYSL 404 Cardiovascular Physiology**

★3 (fi 6) (second 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. Prerequisite: PHYSL 210, or 211 or equivalent.

**PHYSL 410 Modern Techniques in Physiology**

★3 (fi 6) (second term, 0-0-6). Students will rotate through several laboratory exercises which will illustrate some currently used techniques in physiology. Areas will include endocrinology, neurophysiology, membrane and cell physiology. Prerequisites: PHYSL 210, or 211, and 401, or consent of Department.

**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.

**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.

**PHYSL 501 Topics in Cardiovascular Physiology**

★3 (fi 6) (second term, 3-0-0).

**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.

**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.

**PHYSL 512 Physiology of the Respiratory System**

★3 (fi 6) (first term, 3-1s-0). Cellular and molecular physiology of airways and the lung. Major topics include ion transport mechanisms, fluid balance, epithelial electrophysiology, cystic fibrosis, cellular mechanisms of asthma, neural and chemical control of respiration, and perinatal control of breathing. Designed for advanced undergraduate and graduate students. Prerequisites: PHYSL 210, 211 or 252 or consent of Department.

**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 210 or PHYSL 211 and consent of Instructor.

**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.

**PHYSL 545 Physiology of Transport Systems**

★3 (fi 6) (second term, 3-1s-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: PHYSL 210 or 252, ZOOL 241 or 242.

**201.179 Physique, PHYSQ**

Faculté Saint-Jean

**Cours de 1er cycle****0 PHYSQ 100 Introduction à la physique générale**

★3 (fi 6) (premier semestre, 3-0-3). La physique des oscillations et du mouvement ondulatoire, et applications au son et à la lumière. Physique des fluides. Optique géométrique et instruments d'optique de base. Optique ondulatoire, interférométrie. Prérequis: Physique 30, Mathématiques 30. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en PHYS 109 et 130.

**0 PHYSQ 102 Mécanique**

★3 (fi 6) (deuxième semestre, 3-0-3). Cours de mécanique basé sur le calcul. Vecteurs, cinématique. Lois de Newton. Travail et énergie, énergie potentielle, conservation de l'énergie. Quantité de mouvement, moment cinétique, et leur conservation. Moment d'inertie, mouvement d'un corps rigide. Oscillations harmoniques simples, forcées et amorties. Force de gravitation. Prérequis: MATHQ 113, 114 ou MATH 117, et PHYSQ 100. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en PHYSQ 101, 141, ou en PHYS 103, 105, 108, ou en EN PH 131.

**0 PHYSQ 200 Aspects relativistes de la physique moderne**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Les sujets sont les limitations de la physique classique, la théorie spéciale d'Einstein, la contraction des longueurs et la dilatation du temps, le paradoxe des jumeaux, l'équivalence entre la masse et l'énergie, masse et impulsion relativistes. La théorie de la relativité générale inclut: déviation de la lumière, trous noirs, modèles de l'univers et courbure de l'espace-temps. Prérequis: ★6 en physique de première année, et MATHQ 113 ou 114 (en pré- ou corequis). Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en PHYS 251 ou 351.

**0 PHYSQ 211 Thermodynamique et théorie cinétique**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Température, chaleur, travail et première loi de la thermodynamique. Entropie et la deuxième loi de la thermodynamique. Enthalpie, énergie libre de Helmholtz et de Gibbs. Critères d'équilibre thermodynamique. Relations de Maxwell. Transitions de phase. Introduction élémentaire à la théorie cinétique des gaz. Prérequis: PHYSQ 102. Pré- ou corequis: MATHQ 215.

**0 PHYSQ 264 Physique de l'environnement I**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Mathématiques de la croissance et de la décroissance. Consommation des ressources. Mécanismes de transfert de chaleur, isolation thermique. Énergie solaire, technologie solaire active et passive. Eau, vapeur et humidité. Construction de bâtiments pour un climat froid. Prérequis: ★6 en physique de première année et MATHQ 113 ou 114, ainsi qu'un cours additionnel de mathématiques de première année. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en PHYS 263.

**0 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: effet photo-électrique, expérience de Franck et Hertz, expérience de Davisson et Germer, effet Compton, et expérience de Stern et Gerlach. Spectre atomique, dualité onde-corpuscule, relation de de Broglie, théorie ondulatoire, atome de Bohr, équation de Schrödinger, et application à des problèmes simples à une dimension. Principe d'exclusion de Pauli, tableau périodique, électrons dans les métaux. Prérequis: PHYSQ 102 ou 143, ou PHYS 137. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour PHYS 208.

**0 PHYSQ 281 Électricité et magnétisme**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Champ électrique: loi de Gauss, potentiel électrique, condensateurs et diélectriques. Courant électrique et résistance, circuits à courant continu. Champ magnétique: loi d'Ampère, loi de

Faraday, inductance. Propriétés magnétiques et la matière. Circuits alimentés en courant alternatif. Equations de Maxwell et ondes électromagnétiques. Prerequisite: PHYSQ 102. Corequis: MATHQ 214 ou MATH 217.

## 201.180 Plant Science, PL SC

Department of Agricultural, Food and Nutritional Science  
Faculty of Agriculture, Forestry, and Home Economics

**Note:** See also Agricultural, Food and Nutritional Sciences (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.

The following courses were renumbered effective 1995/96:

Old	New	Old	New
PL SC 356	ENCS 356	PL SC 407	ENCS 407
PL SC 406	ENCS 406	PL SC 471	ENCS 471

The following course was renumbered effective 1997/98:

Old	New
PL SC 460	PL SC 360

### Undergraduate Courses

#### 0 PL SC 211 Plant Agriculture

★3 (fi 6) (first term, 3-0-0). The role and importance of field crop and horticultural crop plants in production systems. Societal needs and methods for food and other plant production. Sustainability, environmental aspects, resource conservation, crop protection, crop improvement, and other issues.

#### 0 PL SC 221 Principles of Crop Science

★3 (fi 6) (first term, 3-0-3/2). Agronomic principles and plant-soil-environment interaction in crop production systems. Crop physiology, selection and improvement, crop protection, and crop management practices in Alberta cropping systems. Includes one Saturday field trip at the start of term. (Offered jointly by the Departments of Agricultural, Food and Nutritional Science and Renewable Resources.)

#### 0 PL SC 235 Principles of Horticulture

★3 (fi 6) (first term, 3-0-3/2). A basic course in horticulture, with special emphasis on the physiology of horticultural crops. Influence of climatic, edaphic, and other environmental factors on cultural practices and systems, plant propagation, principles of plant growth regulation, mineral nutrition, and techniques in postharvest preservation of horticultural crops.

#### 0 PL SC 301 Developmental Physiology and Biotechnology of Crop Plants

★3 (fi 6) (first term, 3-0-0). A theoretical approach to plant and plant cell developmental physiology as it relates to crop production and crop improvement through biotechnology, including use of tissue culture and recombinant DNA technologies. Topics covered will include changes through the lifecycle and in response to environmental stress, and genomic and expression control of these changes. Prerequisites: CHEM 161/163 and BIOL 107.

#### 0 PL SC 324 Field and Horticultural Crop Physiology

★3 (fi 6) (second term, 3-0-3). The study of crop growth and development, with emphasis on the interactions among physiology, environment and management. Topics include hormonal control of growth and development, stress adaptation and postharvest physiology. Prerequisite: One of PL SC 221, PL SC 235, BOT 204, BOT 240, or ENCS 204. Note: Not open to students with credit in NU FS 405.

#### 0 PL SC 331 Plant Biochemistry I

★3 (fi 6) (first term, 3-0-3). An introduction to biochemistry emphasizing the basic similarity of all organisms, and the different ways of studying biochemical reactions. Prerequisite: CHEM 161 and 163.

#### 0 PL SC 335 Plant Propagation

★3 (fi 6) (second 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. Prerequisite: PL SC 221 or 235 or consent of Instructor.

#### 0 PL SC 352 Weeds and Weed Control

★3 (fi 6) (second term, 3-0-3). Crop-weed relationships, methods of control, herbicide properties and uses, weed identification. Prerequisite: PL SC 221 or 235 recommended.

#### 0 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, 235 or consent of Instructor.

#### 0 PL SC 355 Cereal, Oilseed, and Pulse Crops

★3 (fi 6) (first term, 3-0-1.5). 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 235 or consent of Instructor.

#### 0 PL SC 357 Greenhouse Crops

★3 (fi 6) (second term, 3-0-3). History and present status of protected cropping industry; greenhouse structural design; systems of environmental control; cultural procedures for some commonly grown greenhouse crops. Offered in alternate years beginning in 1998/99. Prerequisite: PL SC 221, or 235, or consent of Instructor.

#### 0 PL SC 360 Landscape Planning and Design

★3 (fi 6) (first term, 3-0-3). Site planning; introduction to design; graphic techniques, grading and surface drainage. Prerequisite: ★3 in natural sciences or consent of Instructor.

#### 0 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.

#### 0 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.

#### 0 PL SC 432 Plant Biochemistry II

★3 (fi 6) (second term, 3-0-3). A continuation of PL SC 331. Emphasis is on the utilization of energy for synthetic processes. Chemistry and biochemistry of cellular structures, isoprenoids and steroids. Photosynthesis. Nitrogen and protein biochemistry. Enzyme kinetics. Regulation and control of chemical reactions in living organisms. Offered in odd numbered years. Prerequisite: PL SC 331 or ★3 in Biochemistry.

#### 0 PL SC 435 Growth Regulation in Crop Plants

★3 (fi 6) (second term, 3-0-3). Physiological and morphological basis of the control of plant growth and development in horticultural and field crops. Chemistry and effects of hormones and cultural methods of manipulation. Prerequisite: PL SC 221 or 235 or consent of Instructor. Offered in alternate years commencing in 1995-96.

#### 0 PL SC 440 Fruit and Vegetable Crops

★3 (fi 6) (first term, 3-0-3). The science and practice of producing commercially important fruit and vegetable crops with emphasis on botany, taxonomy, morphology, growth processes, production, harvesting, handling quality and composition. Prerequisite: PL SC 221, or 235, or consent of Instructor. Offered in odd-numbered years.

#### 0 PL SC 465 Introduction to Plant Breeding

★3 (fi 6) (first term, 3-0-0). Basic principles of crop improvement by plant breeding. Development of plant breeding methods and their relationship to the major crop species. Prerequisites: GENET 197 or BIOL 207; and ★3 of statistics.

#### 0 PL SC 470 Physiology of Herbicidal Action

★3 (fi 6) (first term, 3-0-0). Absorption, translocation, degradation, mechanism of action. Offered in alternate years commencing in 1994-95. Prerequisites: PL SC 352 and BOT 240.

#### 0 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. Prerequisite: PL SC 380 or consent of Instructor.

#### 0 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. Prerequisite: At least two of ENT 207, PL SC 352 or PL SC 380 as prerequisites and the third as a corequisite. Offered in alternate years beginning in 1997/98. (Offered jointly by the Departments of Agricultural, Food and Nutritional Science and Biological Sciences.) [Agricultural, Food and Nutritional Science]

### Graduate Courses

#### Notes

- (1) All 400-level courses in PL SC and ENCS 406, 407 and 471 may be taken for credit by graduate students with approval of the student's supervisor or supervisory committee.
- (2) See also Agricultural, Food and Nutritional Science (AFNS) listings for related courses.

## 201.181 Polish, POLSH

Department of Modern Languages and Cultural Studies:  
Germanic, Romance, Slavic  
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 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, or they may be encouraged to seek "Credit by Special Assessment" (see \$44.5) where appropriate.
- (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) See also INT D courses offered by the Faculty of Arts.

## Undergraduate Courses

### **POLSH 100 Beginners' Polish**

★6 (*fi 12*) (two term, 3-0-2). Essentials of grammar, reading, and drill on useful expressions designed to give a working knowledge of the Polish language. Not open to students with credit in matriculation-level Polish.

### **POLSH 201 Second-Year Polish I**

★3 (*fi 6*) (first term, 3-0-1). Intermediate grammar, composition, and oral practice based on selected texts of Polish classical and contemporary literature. Prerequisite: POLSH 100 or consent of Department. Formerly POLSH 303.

### **POLSH 202 Second-Year Polish II**

★3 (*fi 6*) (second term, 3-0-1). A continuation of POLSH 201, with greater emphasis on reading and composition. Prerequisite: POLSH 201. Formerly POLSH 304.

### **POLSH 307 Business Polish**

★3 (*fi 6*) (either term, 3-0-0). Readings, discussions and exercises dealing with the specialized language of business in Polish, especially its managing and marketing aspects. Prerequisite: POLSH 202 or consent of Department.

### **POLSH 414 Polish Literature of Renaissance, Baroque, and Classicism**

★3 (*fi 6*) (either term, 3-0-0). Survey of Polish literature and culture from its origins to the end of the eighteenth century. Masterpieces of the Polish renaissance, baroque, and classicism read in the original and/or with the aid of English translations. Prerequisite: POLSH 202 or consent of Department. Note: Not open to students with credit in POLSH 411.

### **POLSH 415 Polish Romanticism and Realism**

★3 (*fi 6*) (either term, 3-0-0). Reading and analysis of the major Polish writers against the aesthetic and philosophical background of romanticism and realism (including poetry, drama, and folklore). Major themes in the Polish realist novel and short story. Prerequisite: POLSH 202 or consent of Department. Note: Not open to students with credit in POLSH 411.

### **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 non-literary texts. Prerequisite: POLSH 202 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 202 or consent of Department. Note: Formerly POLSH 442. Not open to students with credit in POLSH 442.

### **POLSH 498 Conference Course (Linguistics)**

★3-6 (*variable*) (variable, 3-0-0).

### **POLSH 499 Conference Course (Literature/Folklore)**

★3-6 (*variable*) (variable, 3-0-0). Students as well as staff may initiate proposals in any given year for the content of this course. Please consult the Department Chair for the procedure for student-initiated proposals.

## 201.182 Political Science, POL S

Department of Political Science  
Faculty of Arts

**Note:** See also INT D 346, 393, 447, and 468 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

### **POL S 100 Introduction to Government and Politics**

★6 (*fi 12*) (two term, 3-0-0). An introduction to the institutions, processes and problems of democratic states with particular emphasis on the Anglo-American democracies. Some of the topics considered are ideologies, the role of government, democracy, the roles of the executive, legislative and judicial branches of government, political parties and interest groups, and political behavior, including elections. Formerly POL S 200.

### **POL S 103 Modern Political Issues**

★3 (*fi 6*) (either term, 3-0-0). An introduction to contemporary issues and events. Note: This course is designed for students not contemplating a Political Science major. Not open to students who are taking or have taken POL S 100. Formerly POL S 203.

### **POL S 110 Politics of Globalization**

★3 (*fi 6*) (either term, 3-0-0). The myths and realities of the 'so-called' globalization of the international political economy; the historical organization of the global economy; the rise of transnational corporations, changing relations between the north and the south; new roles for the nation-state and implications for democracy, citizenship and political change.

### **POL S 200 Comparative Political Systems**

★6 (*fi 12*) (two term, 3-0-0). Comparative analysis of selected major political systems of the present day, with emphasis on the relationships between political functions and social processes. This is the core course in the field of comparative government and politics and a prerequisite for most 400-level courses in the field. Formerly POL S 300.

### **POL S 201 Ideas for a Changing World**

★3 (*fi 6*) (either term, 3-0-0). This course is designed to provide students who do not intend to specialize in Comparative Politics with an overview of contemporary issues challenging nation-states in selected countries in North America, Europe, Africa, Latin America and Asia. The course is particularly concerned about how changes at the international level have and will affect national self-determination, economic development and political practices. This course is not open to students who are or have been enrolled in POL S 200.

### **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. This is the core course in the field of political philosophy and the prerequisite for 400-level courses in the field. Formerly POL S 310.

### **POL S 212 Ethics and Politics**

★3 (*fi 6*) (either term, 3-0-0). An examination of some moral issues that arise in the political realm, such as the law regarding abortion and euthanasia, capital punishment, obscenity, and the rights of aboriginal peoples. Note: Not intended for students specializing in political science. Not open to students who are taking or have taken POL S 210. Formerly POL S 312.

### **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. Formerly POL S 320.

### **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 who are taking or have taken POL S 100 or POL S 220.

### **POL S 222 Local Government and Administration**

★3 (*fi 6*) (either term, 3-0-0). The structure and functions of local government in Canada with primary emphasis on the Province of Alberta. Note: Designed primarily for students who want one senior course in political science. Not intended for students specializing in political science. Not open to students who are taking or have taken POL S 223. Formerly POL S 322.

### **POL S 223 City Government and Politics**

★3 (*fi 6*) (either term, 3-0-0).

### **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. Formerly POL S 360.

### **POL S 263 Contemporary Issues in Global Politics**

★3 (*fi 6*) (either term, 3-0-0). Global politics consists of a series of new challenges

since the end of the Cold War. These include globalization, the environment, the role of United Nations and other international organizations such as the World Bank and North-South relations. The class is intended for students who have an interest in global politics but are not specializing in the international field. It is not open to students who are taking or have taken POL S 260.

**POL S 276 Problems of Political Development**

★3 (fi 6) (either term, 3-0-0). With its focus on the problems of political integration, political corruption, political stability, elite domination, military and political violence, this course takes a thematic approach and examines the prospects of development and modernization and maintenance of political order in several developing countries. Formerly POL S 376.

**POL S 290 Introduction to Political Behavior**

★3 (fi 6) (either term, 3-0-0). An introduction to the behavioral approach to the study of politics and its application in selected substantive research areas. This is the core course in the field of political behavior. Formerly POL S 390.

**POL S 302 Classic Works of Political Thought**

★3 (fi 6) (either term, 3-0-0). Critical examination of some major works in Political Philosophy not normally covered in POL S 210. Prerequisite: POL S 210 or consent of Department.

**POL S 304 Post-Machiavellian Revolution in Political Thought**

★3 (fi 6) (either term, 3-0-0). An examination of modern alternative views of politics from Machiavelli to the present. Prerequisite: POL S 210 or consent of Department.

**POL S 306 Problems of Democracy, Equality, and Freedom**

★3 (fi 6) (either term, 3-0-0). Selected topics in the theory, practice, and criticism of democracy. 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 324 Topics in Canadian Politics**

★3 (fi 6) (either term, 3-0-0). 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 the Canadian State**

★3 (fi 6) (either term, 3-0-0). This course examines the recent history of relationships between Canada's Aboriginal peoples and the Canadian State. It examines the ways that European political practices and public institutions were imposed upon the First Nations and Aboriginal reactions and resistance to these legal and political changes. 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 200 or POL S 220.

**POL S 332 American Politics and Government**

★3 (fi 6) (either term, 3-0-0). An examination of selected aspects of the American political system. Political institutions and processes will be dealt with at the national, state and local level. Formerly POL S 232. Not open to students with credit in POL S 232.

**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 200 or consent of Department.

**POL S 336 Politics of World Cities**

★3 (fi 6) (either term, 3-0-0). This course is an introduction to the politics of urbanization world-wide. The course will consider both developing and modern political regimes. Topics covered will be as diverse as cities and their neighbourhoods and the relationships between central governments and local authorities. Prerequisites: POL S 200 or POL S 223.

**POL S 350 Women and Politics in Canada**

★3 (fi 6) (either term, 3-0-0). An introduction to women's participation in various aspects of Canadian political life, including the women's movement, party and electoral politics, legislatures and the legal system. Prerequisites: POL S 200 or POL S 210 or POL S 220 or W ST 200.

**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. Prerequisite: POL S 200 or consent of Department.

**POL S 357 The Third World in Global Politics**

★3 (fi 6) (either term, 3-0-0). This course 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 200.

**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. Prerequisite: POL S 260 or consent of Department.

**POL S 361 Pacific Rim Relations**

★3 (fi 6) (either term, 3-0-0). An introduction to the politics and economics of the Asia-Pacific region, and of Canada's relations with the area. Prerequisite: POL S 260 or consent of Department. No prerequisite for students in the BA East Asian Studies program specializing in Political Science.

**POL S 363 International Environment**

★3 (fi 6) (either term, 3-0-0). This course provides an overview of the environmental challenges of the early 21st century and explores various models of sustainable development. Prerequisite: POL S 200 or POL S 260.

**POL S 364 Politics of the International 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 200 or POL S 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 200, or 260, or consent of Department.

**POL S 373 Asian Politics: India to Indonesia**

★3 (fi 6) (either term, 3-0-0). Post independence politics in former colonies, development of political structures and norms, search for political legitimacy and stability, fashioning a political community and a nation out of disparate grouping will be discussed with reference to the countries of South and Southeast Asia. Prerequisite: POL S 200 or consent of Department. Not open to students with credit in POL S 374. Formerly POL S 473.

**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 200 or East Asian Studies Major/Minor or consent of Department. Not open to students with credit in POL S 371 or POL S 372.

**POL S 376 Issues 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. Prerequisite: POL S 200.

**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 332/232; also open to Law students.

**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 392 Interests, Power and Influence in Canadian Politics**

★3 (fi 6) (either term, 3-0-0). This course examines how influence is asserted in Canadian politics and the policy-making process outside the formal democratic institutions of political parties, elections, and legislative representation. Among the topics included are social movements, interest groups, business interests, the media and international organizations. Prerequisite: POL S 220 or consent of Department.

**POL S 395 Political Attitudes and Ideologies**

★3 (fi 6) (either term, 3-0-0). A study of the cognitive psychology of political attitudes and ideologies and their impact on the individual citizen's involvement in politics. Not to be taken by students with credit in POL S 495. Prerequisite: POL S 290 or consent of Department. Formerly POL S 495.

**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 200, or POL S 212, or POL S 260, or consent of Department.

**POL S 397 Elections and Voting Behavior**

★3 (fi 6) (either term, 3-0-0). Analysis of contemporary politics; the various factors that shape party competition and voting behavior and determine election outcomes, and the consequences of these outcomes focusing mainly on recent Canadian federal elections. Prerequisite: POL S 220 or POL S 290 or consent of Department.

**POL S 398 The Mass Media and Democratic Politics**

★3 (fi 6) (either term, 3-0-0). The course covers the role of the mass media, their effects, and their influence on democratic politics. It draws most heavily on the experience of Canada, the United States, and Britain. Different approaches to, and theories of mass media effects and influence are considered and empirical studies in electoral and non-electoral contexts are examined. Prerequisite: POL S 200, 220, or 290, or consent of Instructor.

**POL S 399 Third-Year Honors Seminar**

★3 (fi 6) (either term, 0-3s-0). Note: Restricted to Honors Students in Third Year.

**POL S 404 Topics in Political Philosophy**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: POL S 210 or equivalent.

**POL S 406 Topics in the History of Political Thought I**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: POL S 210 or equivalent.

**POL S 407 Topics in the History of Political Thought II**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: POL S 210 or equivalent.

**POL S 408 Topics in Modern Political Theory I**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: POL S 210 or equivalent.

**POL S 409 Topics in Modern Political Theory II**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: POL S 210 or equivalent.

**POL S 410 Topics in Contemporary Political Philosophy I**

★3 (fi 6) (either term, 0-3s-0). A critical examination of contemporary trends in political philosophy. Prerequisite: POL S 210 or equivalent.

**POL S 411 Topics in Contemporary Political Philosophy II**

★3 (fi 6) (either term, 0-3s-0). A critical examination of contemporary trends in political philosophy. Prerequisite: POL S 210 or equivalent.

**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 Issues 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. Prerequisite: POL S 220 or consent of Department.

**POL S 422 Canadian Public Policy**

★3 (fi 6) (either term, 0-3s-0). Analysis of Canadian public policy including policy formation and implementation. Attention will be given to specific policy areas such as health and welfare, the economy, agriculture, and communication. 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 424 Canadian Political Behavior**

★3 (fi 6) (either term, 0-3s-0). An advanced seminar on current topics and controversies regarding political behavior among elites and the mass public in Canada. Information about the specific topic is available from the department. Prerequisite: POL S 220 or POL S 290 or consent of Department.

**POL S 425 Challenges in Public Management**

★3 (fi 6) (either term, 0-3s-0). This course explores the new challenges that confront Canadian governments in an era when they are being asked to reinvent themselves in response to fiscal restraint and trade liberalization. Among the topics examined are federal-provincial relations, decentralization, state finance and the administration of government. Prerequisite: POL S 220 or POL S 328 or consent of Department.

**POL S 428 Provincial Government and Politics**

★3 (fi 6) (either term, 0-3s-0). A study of structures, functions and processes of selected provincial governments in Canada. 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 430 Aboriginal Politics and Government**

★3 (fi 6) (either term, 0-3s-0). This course provides an overview of contemporary challenges to the Aboriginal people and their governments. Among the topics included are: the complex political relationships between Canada's federal provincial and territorial governments Aboriginal people and governments; the political relationships among the various elements of the Aboriginal population;

and the challenges associated with establishing new systems of governance, justice, and community development. Prerequisite: POL S 220 or NS 100 or NS 210 or NS 211.

**POL S 431 Globalization and the Canadian Political Economy**

★3 (fi 6) (either term, 0-3s-0). Canada's entry into a continental trading bloc, NAFTA, and its obligation to comply with international trading regulations, have fundamentally altered both the domestic policy environment and governmental practices. This course examines these changes as they affect governmental organization, federal-provincial relations, social equity, national sovereignty and democratic processes. Prerequisite: POL S 220 or POL S 260 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 200 or POL S 223 or POL S 336, 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 200 or POL S 223 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. Prerequisite: POL S 200 or 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 200 or POL S 220 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. Prerequisite: POL S 200 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 200 and consent of Instructor.

**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). Prerequisite: POL S 260.

**POL S 461 Selected Problems in International Politics**

★3 (fi 6) (either term, 0-3s-0). The study of selected contemporary problems and/or methods in international relations. Prerequisite: POL S 260 or consent of Department.

**POL S 462 International Political Economy**

★3 (fi 6) (either term, 0-3s-0). This course examines the relationships between international politics and international economics. The interrelationships of power and wealth are analyzed by studying the economic conflicts between nations and the influence of multinational corporations, and the impact of such commodities as oil on national societies. The course also asks whether economic interdependence gives rise to discord or cooperation among states. Prerequisite: POL S 260 or consent of Department.

**POL S 463 War and International Conflict**

★3 (fi 6) (either term, 0-3s-0). A survey covering theorists and theories of war, conventional strategy, and revolutionary strategy. Prerequisite: POL S 260.

**POL S 464 Canadian Foreign Policy**

★3 (fi 6) (either term, 0-3s-0). A discussion of several major topics and problems in Canadian foreign policy since 1945. Prerequisite: POL S 260 or consent of Department.

**POL S 467 The Politics of Pacific Rim**

★3 (fi 6) (either term, 0-3s-0). Current developments in the political economy of the Pacific Rim. The potential for security, political and economic cooperation, and conflict among countries in the region. Prerequisite: POL S 361 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 470 Selected Topics in Comparative Politics**

★3 (fi 6) (either term, 0-3s-0). Selected topics of current interest in comparative politics and government. Prerequisite: POL S 200 or consent of Department.

**POL S 471 Politics of Japan**

★3 (fi 6) (either term, 0-3s-0). This is a course on the domestic politics of postwar Japan which deals with the political structure, political parties and the political economy of the Japanese development model. Prerequisites: POL S 200 or East Asian Studies Major/Minor, or consent of Department.

**POL S 473 Politics of China**

★3 (fi 6) (either term, 0-3s-0). This course is a comprehensive discussion of the domestic politics of China after 1949. It deals with revolution and modernization in Chinese politics, assesses the role of the communist party, and the prospects for reform. Prerequisite: POL S 200 or East Asian Studies major/minor, or consent of Department.

**POL S 478 Topics in Latin American Politics**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: POL S 200 or consent of Department.

**POL S 479 The Politics of Latin America**

★3 (fi 6) (either term, 0-3s-0). An intensive and general survey of Latin American societies and politics, including competing approaches to the state, development models, political movements, social classes. Prerequisite: POL S 200 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 politics of rights. Prerequisite: POL S 390 or POL S 419 or consent of Department; also open to Law students.

**POL S 484 United States Government and Politics**

★3 (fi 6) (either term, 0-3s-0). Advanced study of institutions, political processes, and public policy making in the United States. Prerequisite: POL S 200 or consent of Department.

**POL S 485 Issues in European Politics**

★3 (fi 6) (either term, 0-3s-0). This course begins a survey of the development of political party systems and social cleavages in Western Europe during the post-World War II era. It focuses on the transition from the Fordist to a post-Fordist era, entailing the crisis of social democracy and processes of political dealignment. Prerequisite: POL S 200 or consent of Department.

**POL S 486 Topics in European Politics**

★3 (fi 6) (either term, 0-3s-0). This course focuses on current debates in Europe, including such topics as the emergence of new radical right parties, the successes or problems of green parties and movements, the effects of market liberalization and political change in Eastern and Central Europe, and the resurgence of nationalist discourses. Prerequisite: POL S 200.

**POL S 492 Psychology of Politics**

★3 (fi 6) (either term, 0-3s-0). Advanced study of the role of cognitive processes in the psychology of politics. Prerequisites: POL S 290 and POL S 395. Open to Psychology majors who lack POL S 290 and 395.

**POL S 496 Representation and Electoral Systems**

★3 (fi 6) (either term, 0-3s-0). An examination of the institutional framework within which the electoral process operates under representative government, with emphasis on voting as a mechanism of social choice.

**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.

**Graduate Courses****Notes**

- (1) See also INT D 546 and 593 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) Consent of Department is required for all 500- and 600-level courses.

**POL S 501 Comparative Institutions and Processes**

★3 (fi 6) (either term, 0-3s-0).

**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 510 Topics in the History of Political Thought**

★6 (fi 12) (two term, 0-3s-0). Examination of the text of one or more major works in the tradition of political philosophy

**POL S 511 Topics in Normative Analysis**

★3 (fi 6) (either term, 3-0-0).

**POL S 512 Early Modern Political Theory**

★3 (fi 6) (either term, 0-3s-0). Concentration on one or more works by major political theorists in the early modern period.

**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 522 Canadian Federalism**

★3 (fi 6) (either term, 0-3s-0).

**POL S 523 Canadian Political Parties**

★3 (fi 6) (either term, 0-3s-0).

**POL S 524 Canadian Political Culture**

★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 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 553 Comparative Political Activism**

★3 (fi 6) (either term, 3-0-0).

**POL S 554 Comparative Party and Group Politics**

★3 (fi 6) (either term, 3-0-0).

**POL S 562 Canadian Foreign Policy**

★3 (fi 6) (either term, 0-3s-0). An assessment of contemporary Canadian foreign policy and competing approaches to its study.

**POL S 564 Conflict Resolution and Strategic Studies**

★3 (fi 6) (either term, 3-0-0).

**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 581 Studies in United States Politics**

★3 (fi 6) (either term, 0-3s-0).

**POL S 592 Political Psychology**

★3 (fi 6) (either term, 3-0-0).

**POL S 594 The Comparative Study of Political Mass Movement**

★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 600 Theories and Methods of Comparative Politics**

★3 (fi 6) (either term, 0-3s-0). Traditional and critical perspectives.

**POL S 608 Advanced Study in Comparative Politics**

★3 (fi 6) (either term, 0-3s-0).



**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 625 Readings in Urban Analysis**

★3 (*fi 6*) (either term, 0-3s-0).

**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 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 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 699 Readings in Political Behavior and Psychology**

★3 (*fi 6*) (either term, 3-0-0).

**POL S 900 Directed Research Project**

★3 (*fi 6*) (variable, unassigned).

## 201.183 Postgraduate Medical Education, PGME

Division of Studies in Medical Education  
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.

## 201.184 Psychiatry, PSYCI

Department of Psychiatry  
Faculty of Medicine and Dentistry

### Undergraduate Courses

**PSYCI 446 Student Internship**

★6 (*fi 12*) (two term, 8 weeks). Student internship for students in Phase III, MD program only.

### 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; physical methodologies used in studying neurochemical aspects of psychiatry (gas chromatography: mass spectrometry, high pressure liquid chromatography, receptor binding techniques, etc.). Prerequisite: Permission 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.

### Course Beginning in 2000-2001

**PSYCI 546 Psychiatry Student Internship**

★8 (*fi 16*) (either term, 8 weeks). Student internship in Psychiatry for students registered in the MD program.

## 201.185 Psychologie, PSYCE

Faculté Saint-Jean

### Cours de 1er cycle

#### 201.185.1 Domaine des Arts

**PSYCE 105 Comportement social et individuel**

★3 (*variable*) (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. Prérequis: PSYCE 104. Anciennement PSYCE 261. Cours à distance. Voir \$200.

**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 de l'enfant et de l'adolescent. L'accent sera mis sur le développement du langage et de la pensée, et sur la relation qui existe entre eux. Prérequis: PSYCE 104/105 ou l'équivalent. Anciennement PSYCE 353.

**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. Prérequis: PSYCE 104/105 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. Prérequis: PSYCE 104/105 ou l'équivalent. Note: PSYCE 241 et SOC 241 ne peuvent pas être suivis tous les deux pour crédits. Anciennement PSYCE 341.

**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. Prérequis: l'accord du Vice-doyen aux affaires académiques.

**201.185.2 Domaine des Sciences****PSYCE 104 Procédés psychologiques de base**

★3 (variable) (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 prérequis pour la plupart des cours de psychologie et est normalement suivi de PSYCE 105. Anciennement PSYCE 260. Cours à distance. Voir \$200.

**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. Prérequis: SCSOC 322. Ce cours n'est pas accessible aux étudiants ayant des crédits en PSYCO 266.

**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, au mouvement, à l'apprentissage, à la motivation et à la pensée. Prérequis: PSYCE 104 et Biologie 30 ou l'équivalent. Anciennement PSYCE 375.

**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. Prérequis: PSYCE 104. Anciennement PSYCE 361.

**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. Prérequis: PSYCE 223. Ce cours n'est pas accessible aux étudiants ayant des crédits en PSYCO 389 ou 489.

**PSYCE 354 Fondements de la science cognitive**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Une introduction à l'étude des processus mentaux: la mémoire, l'attention et la cognition. Les principaux sujets abordés: le traitement d'information visuelle, l'attention, la mémoire à court et à long terme, l'apprentissage et la compréhension du langage. Prérequis: PSYCE 104 ou 105 et SCSOC 322. Note: ce cours n'est pas accessible aux étudiants ayant des crédits pour PSYCE 353 ou PSYCO 363.

**PSYCE 458 Psychologie avancée de la cognition**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). A partir de recherches publiées, discussion d'un aspect particulier de la cognition humaine (la lecture, le bilinguisme) en se servant de critères d'évaluation théoriques et méthodologiques. Possibilité de recherche dirigée. Prérequis: SCSOC 322 et PSYCE 354 et l'accord du professeur.

**201.186 Psychologie de l'éducation, PS ED**

Faculté Saint-Jean

**Cours de 1er cycle****PS ED 200 Introduction à la psychologie du développement**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude du comportement humain à travers les différentes étapes de son développement. Les notions de développement physique, intellectuel, social et moral sont abordées en relation avec le comportement en milieu scolaire. Ce cours n'est pas accessible aux étudiants ayant des crédits en PS ED 263, 266, 366, 267, 367 ou leurs équivalents.

**PS ED 201 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. Étude des applications de ces théories dans l'enseignement avec une insistance particulière sur la mesure et l'évaluation. Ce cours n'est pas accessible aux étudiants ayant des crédits en PS ED 264, EDUC 302 ou leurs équivalents.

**PS ED 263 Introduction à la psychologie du développement**

★1.5 (fi 3) (l'un ou l'autre semestre, 1.5-0-0). Etude du comportement humain à travers les différentes étapes de son développement. Les notions de développement physique, intellectuel, social et moral sont abordées en relation avec le comportement en milieu scolaire. Ce cours n'est pas accessible aux étudiants ayant des crédits en PS ED 266, 366, 267, 367 ou leurs équivalents.

**PS ED 264 Psychopédagogie de l'apprentissage**

★1.5 (fi 3) (l'un ou l'autre semestre, 1.5-0-0). Théories générales de l'apprentissage et les différents facteurs qui influencent l'apprentissage en milieu scolaire. Etude

de la relation de l'apprentissage avec d'autres phénomènes psychologiques tels que l'intelligence, la motivation, la maturation et leurs applications dans l'enseignement. Ce cours n'est pas accessible aux étudiants ayant des crédits en PS ED 266, 267, 366, 367 ou leurs équivalents.

**PS ED 265 Psychologie des relations interpersonnelles**

★1.5 (fi 3) (l'un ou l'autre semestre, 1.5-0-0). Les techniques de base pour une communication efficace; le développement de groupes de soutien; une évaluation des attitudes et des valeurs qui contribuent à un meilleur enseignement, méthodes pour gérer le stress. Ce cours n'est pas accessible aux étudiants ayant des crédits en PS ED 495.

**PS ED 362 L'adaptation scolaire**

★1.5 (fi 3) (l'un ou l'autre semestre, 1.5-0-0). Introduction aux diverses dimensions de l'adaptation scolaire: aspects cognitif, socio-affectif, culturel, scolaire; dépistage et identification des problèmes de l'adaptation scolaire; modèles d'intervention; politiques d'intégration et guides pédagogiques du ministère de l'Éducation. Prérequis ou corequis: PS ED 263 et PS ED 264 ou l'accord du Vice-doyen (Éducation). Ce cours n'est pas accessible aux étudiants ayant des crédits en PS ED 482.

**PS ED 465 Psychologie de la communication**

★1.5 (fi 3) (l'un ou l'autre semestre, 1.5-0-0). Le contenu du cours est centré sur l'approfondissement des habiletés nécessaires à la bonne communication dans la salle de classe, au mode d'acquisition des comportements; et à l'identification des éléments pour poursuivre son développement personnel et professionnel. Ce cours n'est pas accessible aux étudiants ayant des crédits en PS ED 495.

**PS ED 477 Bilinguisme et cognition dans l'éducation de l'enfant**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Théories et recherches relatives au processus d'acquisition du bilinguisme dans les programmes d'immersion et les programmes francophones. L'évaluation du développement du bilinguisme inclut les dimensions socio-linguistiques et socio-culturelles.

**PS ED 482 Sensibilisation aux difficultés d'apprentissage chez l'enfant d'âge scolaire**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Concepts d'apprentissage et de difficultés d'apprentissage. Etude des difficultés d'apprentissage les plus fréquentes en milieu scolaire. Impact de ces difficultés sur la vie émotive de l'enfant, sur sa vie à l'école, sur les parents, et sur la famille en général. Possibilités d'interaction et d'aide de l'enseignant face à ces difficultés. Prérequis: PS ED 263 ou l'accord du Vice-doyen aux affaires académiques.

**PS ED 496 Etude de l'administration des organismes étudiants**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude individuelle portant sur l'administration des organismes étudiants et le développement des connaissances dans le domaine des relations interpersonnelles et de la dynamique de groupe. (Crédit/Echec). Prérequis ou corequis: 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 qui s'étend sur toute l'année.

**PS ED 497 Séminaires "senior"**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Le contenu du cours varie d'une année à l'autre.

**201.187 Psychology, PSYCO**

Department of Psychology  
Faculty of Arts

**Undergraduate Courses****201.187.1 Faculty of Arts Courses**

**Note:** Prerequisites to some Arts courses in the Department may be found in the following Science section of this listing.

**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. Prerequisite: PSYCO 104. Formerly PSYCO 261.

**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, 105, and STAT 151 or former PSYCO 211.

**PSYCO 223 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. Prerequisites: PSYCO 104 and 105 or equivalent. Note: PSYCO 223 and FAM 343 may not both be taken for credit. Formerly PSYCO 353 (1989-90 or earlier).

#### **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 and 105 or equivalent. Formerly PSYCO 383.

#### **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 and 105 or equivalent. Note: PSYCO 241 and SOC 241 may not both be taken for credit. Formerly PSYCO 341.

#### **PSYCO 258 Cognitive Psychology**

★3 (fi 6) (either term, 3-0-0). A survey of findings of theoretical issues in the study of cognition. Topics include perception, attention, knowledge representation, memory, learning, language, reasoning, and problem solving. Note: Not open to students with credit in PSYCO 353 (taken in 1990-91 or 1991-92), 358, or 373. Prerequisites: PSYCO 104 and STAT 151 or former PSYCO 211. Formerly PSYCO 358.

#### **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. Corequisites: STAT 151 or the former PSYCO 211, and PSYCO 212. Restricted to, and required of, third-year students in the Honors Psychology program.

#### **PSYCO 301 History of Psychology**

★3 (fi 6) (either term, 3-0-0). History of psychology, with an emphasis on 19th and early 20th century (i.e. pre-1950) developments. Significant trends in contemporary psychology will also be discussed. Prerequisites: PSYCO 104 and 105; one of PSYCO 223, 233, 241, 258; and one of PSYCO 267, 275, 281.

#### **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 and 105 and consent of Department. Note: Students are encouraged to check with the Department for the topic for the current year.

#### **PSYCO 323 Perceptual and Cognitive Development**

★3 (fi 6) (either term, 3-0-0). The development of the ability to process information from the environment. Attention, memory, and concept formation in infants and young children. Prerequisite: PSYCO 223. Formerly PSYCO 454.

#### **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: PSYCO 223, and STAT 151 or former PSYCO 211.

#### **PSYCO 339 Abnormal Psychology**

★3 (fi 6) (either term, 3-0-0). A general introduction. Prerequisite: PSYCO 233. Note: Not open to students with credit in PSYCO 489 or 389. Formerly PSYCO 389.

#### **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.

#### **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.

#### **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 Honors Psychology program.

#### **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 and 105, and STAT 151 or former PSYCO

211, and consent of Department. Note: Students are encouraged to check with the Department for the topic for the current year.

#### **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 defence of the practicum report and discussion of related issues. Prerequisites: WKEXP 961, WKEXP 962, and WKEXP 963.

#### **PSYCO 423 Advanced Topics in Developmental Psychology**

★3 (fi 6) (either term, 3-0-0). An in-depth review and analysis of research in an area of developmental psychology. Prerequisites: STAT 151 or former PSYCO 211, and PSYCO 323 or consent of Department. Note: Students are encouraged to check with the Department for the topic for the current year. Formerly PSYCO 456.

#### **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 151 or former PSYCO 211, and PSYCO 339.

#### **PSYCO 435 Introduction to Clinical Psychology**

★3 (fi 6) (either term, 3-0-0). Application of the theories, principles, and methods of psychology to understand and alleviate human problems. Prerequisite: PSYCO 339.

#### **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. Formerly PSYCO 491.

#### **PSYCO 441 Experimental Social Psychology**

★3 (fi 6) (either term, 3-0-3). An intensive study of methods for investigating social behavior. The evaluation of published research, design of experiments, analysis and communication of results will be stressed. Opportunity for supervised research projects. Prerequisites: STAT 151 or former PSYCO 211, PSYCO 241, and one of PSYCO 281; 353 (taken in 1990/91 or 1991/92), or 354; 356; or 364.

#### **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 151 or former PSYCO 211, and PSYCO 241.

#### **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.

#### **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 390. Restricted to, and required of, fourth-year students in the honors psychology program.

#### **PSYCO 493 Phenomenology and Psychological Research**

★3 (fi 6) (either term, 3-0-2). An intensive study of methods for investigating variations in self-reported experience. The development, use, and validation of methods for studying self-reported experience in psychological research will be stressed. Supervised research. Prerequisites: Either PSYCO 436 or 495, and STAT 151 or former PSYCO 211.

#### **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 104 and 105 (or equivalent).

#### **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. Prerequisites: A 300-level psychology course and consent of Department.

## 201.187.2 Faculty of Science Courses

#### **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. The course is a prerequisite to most courses in the department and is normally followed by PSYCO 105 (see §201.206.1.1).

#### **PSYCO 267 Perception**

★3 (fi 6) (either term, 3-0-0). An introduction to theoretical and experimental issues associated with sensory and perceptual experience. Note: Students cannot receive credit for both PSYCO 266 and PSYCO 267. Prerequisites: STAT 151 or the former PSYCO 211.

#### **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 and Biology 30 or equivalent.

#### **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.

#### **PSYCO 351 Human Information Processing**

★3 (fi 6) (either term, 3-0-0). An examination of theories, issues, and published research in the general area of human information processing, with an emphasis on visual information processing. Topics include: attention; visual persistence; pattern, letter, word, and object recognition; scene perception; human performance; visual memory. Prerequisite: PSYCO 258.

#### **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 151 or the former PSYCO 211, and PSYCO 258. Note: Not open to students with credit in PSYCO 353 (1990/1992) or PSYCO 363 (1989/90 or earlier).

#### **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.

#### **PSYCO 364 Methods in Perception**

★3 (fi 6) (either term, 0-0-6). Laboratory methods used to study perception. Course emphasizes lab experience, data collection, analysis and interpretation, literature search, and report writing. Prerequisites: STAT 151 or the former PSYCO 211; PSYCO 267.

#### **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. Provides the historical background and knowledge of recent theoretical and experimental contributions required to understand current conceptual schemes and disputes. Prerequisites: PSYCO 266 or PSYCO 267 and MATH 113 or 114.

#### **PSYCO 371 The Neurobiology of Learning and Memory**

★3 (fi 6) (either term, 3-0-0). An advanced level course examining specific physiological accounts of reinforcement, learning and memory phenomena, and the relationship between physiological models and behavioral theory. The use of animal models for the study of memory dysfunction in humans will also be considered. Prerequisites: PSYCO 275 and 281.

#### **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 and 105 and STAT 151 or the former PSYCO 211, and BIOL 207.

#### **PSYCO 377 Human Neuropsychology**

★3 (fi 6) (either term, 3-0-0). Changes in mood, motivation, perception, attention, memory and language as revealed by studies of structural alterations in the human brain. Prerequisite: PSYCO 275. Note: Previously offered as PSYCO 277. Students cannot receive credit for PSYCO 377 if they received credit for PSYCO 277.

#### **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 151 or the former PSYCO 211, and PSYCO 281.

#### **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.

#### **PSYCO 390 Honors Thesis I: 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. Corequisites: STAT 151 and PSYCO 212. Restricted to, and required of, third-year students in Honors Psychology.

#### **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. Students are encouraged to check with the Department regarding the topic for the current year. Prerequisites: STAT 151 or the former PSYCO 211, a 300-level Psychology course and consent of Department.

#### **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. Students are encouraged to check with the Department regarding the topic for the current year. Prerequisites: STAT 151 or the former PSYCO 211, a 300-level Psychology course and consent of Department.

#### **PSYCO 410 Industrial Internship Practicum**

★3 (fi 6) (first term, 0-3s-0). Required by all students who have just completed a Science Psychology Industrial Internship Program. Must be completed during the first academic term following return to full-time studies. Note: A grade of 1 to 9 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 933.

#### **PSYCO 451 Visual Cognition and Attention**

★3 (fi 6) (either term, 3-0-0). Examines theoretical and empirical issues in visual attention, object and scene perception, and visual imagery and memory. Topics include the representation of visual information, contextual effects in object recognition, and higher-level phenomena such as visual problem solving, navigation and route-learning, and memory for visual events. Prerequisite: PSYCO 351.

#### **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.

#### **PSYCO 453 Psychology of Language**

★3 (fi 6) (either term, 3-0-0). Covers theoretical and empirical issues in language comprehension, production, and acquisition from a cognitive perspective. Topics include the representation of word structure and meaning, the creation of syntactic structures, and discourse-level phenomena such as inferencing and the use of metaphors. Prerequisite: PSYCO 353 (1990/91 or 1991/92) or 354.

#### **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 include the relationship of psychological, environmental, social and health factors to cognitive processes. Prerequisite: One of PSYCO 353 (1990/91 or 1991/92) or 354.

#### **PSYCO 468 Auditory Perception**

★3 (fi 6) (either term, 3-0-0). Nature of basic auditory experience. Includes topics of pitch perception, loudness and masking, perception of complex sounds, auditory pattern perceptions, and localization of sound. Prerequisite: PSYCO 365.

#### **PSYCO 475 Biological Bases of Behavior**

★3 (fi 6) (first term, 0-0-6). Basic neuroanatomy and neuropsychology of sensory and motor systems. Prerequisite or corequisite: PSYCO 371 or 377.

#### **PSYCO 476 Physiological Psychology**

★3 (fi 6) (second term, 0-0-6). A laboratory course in experimental design and research in physiological psychology. Prerequisite: PSYCO 475.

#### **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.

#### **PSYCO 482 Methods of Behavior and Learning**

★3 (fi 6) (either term, 0-0-6). Laboratory methods used to study Pavlovian conditioning, instrumental conditioning and decision processes. Prerequisite: PSYCO 381.

**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.

**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. Note: Students are encouraged to check with the Department for the topics for the current year.

**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. Prerequisite: A 300-level psychology course and consent of Department.

**Graduate Courses**

**Note:** See also INT D 554 and 654 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.

**201.187.3 Faculty of Arts Courses****PSYCO 502 Professional and Ethical Issues**

★2 (fi 4) (either term, 3-0-0).

**PSYCO 541 Advanced Social Psychology**

★3 (fi 6) (either term, 3-0-0).

**PSYCO 587 Advanced Abnormal Psychology**

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

**PSYCO 600 Individual Studies**

★3 (fi 6) (either term, 3-0-0).

**PSYCO 620 Topics in Cognition**

★3 (fi 6) (either term, 3-0-0).

**PSYCO 622 Topics in Developmental Psychology**

★3 (fi 6) (either term, 3-0-0).

**201.187.4 Faculty of Science Courses****PSYCO 505 Conference Course in Psychology**

★3 (fi 6) (either term, 3-0-3).

**PSYCO 531 Design and Analysis in Psychological Research I**

★3 (fi 6) (first term, 3-0-1).

**PSYCO 532 Design and Analysis in Psychological Research II**

★3 (fi 6) (second term, 3-0-1). Prerequisite: PSYCO 531 or equivalent.

**PSYCO 560 Memory and Cognition**

★3 (fi 6) (either term, 3-0-0).

**PSYCO 561 Advanced Psychology of Conditioning and Learning**

★3 (fi 6) (either term, 3-0-0).

**PSYCO 562 Advanced Psychology of Perception**

★3 (fi 6) (either term, 3-0-0).

**PSYCO 567 Psychology of Development**

★3 (fi 6) (either term, 3-0-0).

**PSYCO 575 Advanced Physiological Psychology**

★3 (fi 6) (either term, 3-0-0).

**PSYCO 576 Cognitive Neuroscience**

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

**PSYCO 604 Topics in Quantitative Methods**

★3 (fi 6) (either term, 3-0-0).

**PSYCO 606 Topics in Instrumentation**

★3 (fi 6) (either term, 3-0-0).

**PSYCO 610 Topics in Conditioning and Learning**

★3 (fi 6) (either term, 3-0-0).

**PSYCO 612 Topics in Perception**

★3 (fi 6) (either term, 3-0-0).

**PSYCO 632 Special Topics in Theoretical Psychology**

★3 (fi 6) (either term, 0-3s-0).

**201.188 Public Health Sciences, PHS**

Department of Public Health Sciences  
Faculty of Medicine and Dentistry

**Graduate Courses****PHS 500 Introduction to Health Systems and Health Policy**

★3 (fi 6) (first term, 3-0-0). A review and development of the Canadian health and welfare system and its structure and functions. An analysis of selected issues in the delivery of health and welfare services.

**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 509 Field Practicum**

★6 (fi 12) (Spring/Summer, 16 weeks).

**PHS 510 Chemical Principles, Fate, and Behavior of Environmental Contaminants**

★3 (fi 6) (either term, 3-0-0). Concepts of chemical speciation, equilibrium, phase distribution, and biodegradation. Application of chemical principles to study speciation, distribution, transformation, biodegradation, and bioaccumulation of environmental contaminants. Introduction to human exposure to contaminants.

**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.

**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.

**PHS 520 Occupational and Environmental Diseases**

★3 (fi 6) (either term, 3-0-0). This course is designed to provide health professionals with an overview of the epidemiology, recognition, diagnosis, treatment, and prevention of occupational and environmental diseases encountered by health care practitioners. This course will include both an organ system and toxin or hazard approach.

**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 will cover 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.

**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.

**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: PHS 591 or consent of Instructor.

**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.

**PHS 541 Population Health I: Determinants of Health**

★3 (fi 6) (either term, 3-0-0). This course will introduce the student to the Health Fields Concept and Health Determinants as a conceptual base to describe health and disease in the Canadian population. A broad view is adopted as a framework for consideration of the many aspects of life in Canada which interact to produce health and ill health. The perspectives of both the public and health professionals will be analysed. Programming needs in relation to the determinants of health will be addressed.

**PHS 544 Population Health II: A Multicultural Perspective**

★3 (*fi 6*) (either term, 3-0-0). This course is designed to introduce the student to some of the theoretical approaches that have been taken in the design of health care in Canada, with a special focus on Aboriginal, immigrant and refugee populations. The perspectives of both clients and health care professionals, and models for community-level programming are considered within the framework of ethnic diversity.

**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 560 Health Data and Information Management**

★3 (*fi 6*) (either term, 3-0-0). Introduction to data base management systems; source of health data and information. An overview of health information systems, trends and issues. Health indicators and use of administrative health data for quality assurance and outcome oriented analyses; life table and survival analysis, forecasting health services needs. Prerequisite: an introductory statistics and practical skills in using spreadsheets (Lotus) and statistical package (SPSS/W).

**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 590 Introduction to Epidemiology**

★3 (*fi 6*) (first term, 3-0-0). An introduction to the principles and methods of epidemiology and their application. Topics include indices to describe and measure health status, design strategies, statistical association, clinical significance, causation, descriptive studies, case control studies, cohort studies, intervention studies, bias confounding, and screening.

**PHS 591 Statistical Methods in Epidemiology**

★3 (*fi 6*) (either term, 3-0-0). An introduction to elementary biostatistical methods used to analyze epidemiologic data. Topics will include person-years, incidence rates, prevalence rates, direct and indirect standardized, standardization mortality ratio, attributable risk, analysis of 2 x 2 tables, Fisher's exact test, odds ratio, Mantel-Haenszel methods, life tables, Kaplan-Meier methods. A knowledge of computers is not required. Prerequisite: Introductory statistics course or permission of Instructor.

**PHS 592 Topics in Communicable and Chronic Diseases in Epidemiology**

★3 (*fi 6*) (either term, 3-0-0). Epidemiology is introduced as a science basic to public health, preventive medicine, and clinical evaluation. The course focuses on populations or communities rather than on individual patients. The student will learn that epidemiologic methods: (1) provide the basis for understanding the causes, distribution and dynamics of disease and health in a population; (2) are basic to assessing the impact of prevention programs; and (3) are essential for evaluating interventions and new drugs, devices/technologies, and procedures/therapies in clinical trials. The student will explore trends for the four leading causes of mortality and morbidity in Canada, and three of the leading causes of death internationally. Prerequisite: A course in statistics in any area.

**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 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.

**PHS 630 Health Care Research Methods**

★3 (*fi 6*) (either term, 3-0-0). An overview of research needs in health and social services research. Advanced level statistical methods in health sciences; reliability and validity; instrument design and scaling; comparative and longitudinal designs; and internal and external validity. Prerequisite: PHS 560.

**PHS 631 Seminar in Health Program Evaluation**

★3 (*fi 6*) (either term, 3-0-0). An overview of current practice in health and social services program evaluation. Models for health and social program evaluation and issues. Emphasis on a practical but scientific and valid approach to improving the quality and efficiency of health and social programs. Prerequisite: PHS 630.

**PHS 650 Health Finance**

★3 (*fi 6*) (either term, 3-0-0). The structure of case-mix measures. Case-mix based hospital funding systems. Population-based health care funding. The analysis of management decisions in a case-mix environment.

**PHS 660 Health System Planning and Policy Analysis**

★3 (*fi 6*) (either term, 3-0-0). An overview of health planning and policy analysis; patient classification, case-mix and relative values in health care; hospital service population model and population based resource allocation; measurement of health needs and surveys; service queue and health system modelling. Prerequisite: PHS 560.

**PHS 670 Health Care Economics**

★3 (*fi 6*) (either term, 3-0-0). A detailed analysis of the use of economic tools to selected economic issues including health care funding policies, the introduction of user fees, and the introduction of managed care.

**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.

**PHS 690 Advanced Methods in Epidemiology**

★3 (*fi 6*) (second term, 3-0-0). Epidemiologic methods related to specific study designs and general issues relating to the conduction of epidemiologic studies are covered at an advanced level. Practical and theoretical aspects will be explored.

**PHS 691 Statistical Methods in Epidemiology II**

★3 (*fi 6*) (either term, 3-0-0). Advanced methods used to analyze epidemiologic data with an emphasis on regression analysis; for case-control studies; conditional and unconditional logistic regression; for cohort studies; exponential and Weibull survival regression and the Cox proportional model. Students will be required to use statistical software for assignments. Prerequisite: PHS 591 or consent of Instructor.

**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.

**PHS 694 Research Design and Data Analysis in Clinical Medicine**

★3 (*fi 6*) (either term, 3-0-0). This course is intended to increase the skills of investigators in the design of clinical studies and in obtaining funding for these. The course will focus on developing a research proposal. Topics to be discussed include: literature searches, ethical considerations, study design, data collection and analysis, logistics and budgeting, and report writing and publication. This course is designed for physicians and other health professionals at the beginning of their research careers or for those who are changing from laboratory to clinical research. Prerequisite: An introductory statistics course.

**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.

**PHS 702 Project in Health Policy Development**

★3 (*fi 6*) (either term, 0-3s-0).

**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 770 Project in Health Care Economics**

★3 (*fi 6*) (either term, 0-3s-0).

**PHS 791 Applied Data Analysis in Epidemiology**

★3 (*fi 6*) (either term, 3-0-0). The objective of this course is to provide students in epidemiology with practical experience in analyzing epidemiologic data. Each course will be arranged between the instructor and student. The student will undertake the analysis of an existing data set after having established a research question, a working hypothesis, and an analytical strategy. The preferred final report will be a completed manuscript suitable for peer reviewed publication.

Prerequisites: consent of Instructor, PHS 590, a basic statistics course, and PHS 591.

### PHS 799 Individual Directed Reading and Research in Epidemiology

★3 (fi 6) (either term, 0-3s-0).

## 201.189 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.

## Undergraduate Courses

### RADDI 446 Student Internship

★1.5 (fi 3) (two term, 2 weeks). Student Internship for students in Phase III, MD program only.

## 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.
- (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 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.

## Courses Beginning in 2000-2001

### RADDI 546 Radiology and Diagnostic Imaging Student Internship

★2 (fi 4) (either term, 2 weeks). Radiology and Diagnostic Imaging Student Internship for students registered in the MD program.

## 201.190 Recreation and Leisure Studies, RLS

Faculty of Physical Education and Recreation

### Notes

- (1) See also INTD 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 and Leisure Studies) 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 Leisure in Canadian Life

★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. Not open to BA (Recreation and Leisure Studies) students.

### RLS 122 Leadership in Recreation and Leisure Organizations

★3 (fi 6) (either term, 2-0-2). 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 133 The Human-Nature Relationship in Leisure

★3 (fi 6) (either term, 3-0-1). This course will explore the relationship between leisure/recreation and natural spaces. The topics will include perspectives by nature writers, environmental audits of recreation facilities, and facets of outdoor recreation (e.g., benefits of outdoor recreation, adventure therapy, and outdoor leadership competencies).

### RLS 210 Recreation and Leisure Scholarship

★3 (fi 6) (either term, 3-0-1). 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.

### RLS 223 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.

### RLS 224 The Political Economy of Leisure

★3 (fi 6) (either term, 3-0-0). An examination of the roles of politics and of the economy in structuring the nature and distribution of leisure opportunities in a society such as Canada. The course will analyse relationships between the democratic political process and the dynamics of wealth creation, and will consider the implications of these for leisure provision in a mixed economy.

### RLS 225 Principles and Processes in Planning for Leisure

★3 (fi 6) (either term, 3-0-0). Examination of the planning process with particular reference to the roles of recreation professionals, planners, and citizens in planning for leisure opportunities.

### RLS 230 Recreation and Community Development

★3 (fi 6) (either term, 3-0-0). Analysis of the social and political processes through which groups and individuals work to mobilize resources and establish relationships to fulfil community needs.

### RLS 232 Program Planning, Marketing, and Implementation

★3 (fi 6) (either term, 3-0-0). An examination of the general principles involved in designing, marketing, implementing and evaluating recreation and leisure programs. Emphasis will be placed upon the utilization of systematic program planning and marketing approaches to matching opportunities to client needs and consumer demands. Prerequisite: RLS 225 or consent of Faculty.

### RLS 263 Principles of Tourism

★3.0 (fi 6) (either term, 3-0-1). 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: Not open to students with credit in RLS 463.

### RLS 300 Philosophies of Leisure

★3.0 (fi 6) (either term, 3-0-1). 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. Prerequisite: any PHIL course. Note: Not open to students with credit in RLS 220.

### 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.

### RLS 335 Volunteers and Voluntary Organizations in Recreation

★3 (fi 6) (either term, 3-0-0). An examination of (1) the nature of volunteer involvement in the delivery of recreation; and (2) the structure and processes of the voluntary organizations that make up the recreation delivery system.

### 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 centring 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, 3-0-1). 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. This course requires the payment of additional miscellaneous fees. See §22.2.3 for details. Prerequisite: RLS 225.

#### RLS 462 Outdoor Recreation Resources

★3 (*fi 6*) (either term, 3-0-1). An examination of the principles of resource allocation and land use in a recreational context together with an analysis of the patterns and trends in outdoor recreation and their impact on the resource base. Particular attention is given to evaluating a variety of environmental settings in terms of their suitability for outdoor recreation and the types of recreational experiences associated with them. This course requires the payment of additional fees. §22.2.3 for details. Prerequisite: RLS 225.

#### RLS 463 Leisure and Tourism

★3 (*fi 6*) (either term, 3-0-1). An examination of the tourism system, its nature, history, and organization with particular emphasis on the Canadian scene. The underlying dynamics of the cultural, social, economic, and psychological aspects of tourism and travel will be discussed. The natural, man made, and cultural environment in which travel occurs, and the resulting impacts of travel are covered. This course requires the payment of additional miscellaneous fees. See §22.2.3 for details.

#### RLS 464 Commercial Recreation

★3 (*fi 6*) (either term, 3-0-0). This course will examine the provision of leisure-related products or services by private enterprise. The course is also intended to provide insight into the applicability and implications of entrepreneurial practices in the public and non-profit sectors of the leisure delivery system. Prerequisite: RLS 232 or PERLS 350.

#### RLS 472 Sport and the Community

★3 (*fi 6*) (either term, 3-0-0). Emphasis upon the values and policies underlying articulated community, provincial and national sports development programs, with a special concern for extending the playing life span of sports participants. Examination of the social, psychological and cultural roles of sports in society. Prerequisites: RLS 100; RLS 220; PERLS 204. A minimum of two basic sociology courses is recommended.

#### 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 or consent of Faculty.

#### RLS 490 Selected Topics

★3 (*fi 6*) (variable, variable). Topics of current interest in leisure and recreation. Prerequisite: consent of course coordinator. Restricted to third- and fourth- year Recreation students.

#### RLS 499 Directed Study

★3 (*fi 6*) (variable, variable). Individual or group study on a theme or issue in recreation, carried out under the direction of a member of the academic staff. Restricted to fourth year Recreation students.

## Graduate Courses

#### RLS 510 Concepts and Theories of Leisure and Recreation

★3 (*fi 6*) (first term, 3-0-0).

#### RLS 531 Socio-Psychological Dimensions of Recreation Involvement

★3 (*fi 6*) (second term, 3-0-0).

#### RLS 541 Outdoor Recreation Resources: Planning and Management

★3 (*fi 6*) (either term, 3-0-0).

#### RLS 551 Public Recreation Services Policy and Planning

★3 (*fi 6*) (second term, 3-0-0).

## 201.191 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 190 Human Behavior in Illness and Disability

★3 (*fi 6*) (either term, 3-0-0). Orientation to psychosocial influence in health, illness and disability. Reactions to stress caused by physical trauma, hospitalization, and old age.

#### REHAB 282 Gross Anatomy I

★3 (*fi 6*) (either term, 3-0-4). Lectures and dissections on the upper limb, supplemented by classes in functional anatomy in the area.

#### REHAB 283 Gross Anatomy II

★3 (*fi 6*) (either term, 3-0-4). Lectures and dissections on the lower limb and trunk, supplemented by classes in functional anatomy of the area. Prerequisite: REHAB 282.

#### REHAB 285 Histopathology

★3 (*fi 6*) (either term, 2-1L-0). Structure and function of normal body tissues and their responses to pathological change. Prerequisite: PHYSYL 161.

#### REHAB 290 Communication in Rehabilitation

★3 (*fi 6*) (either term, 0-4s-0). Credit. Theory and practice in communication and learning for the rehabilitation practitioner. Prerequisite: OCCTH 335.

#### REHAB 295 Rehabilitation Principles

★3 (*fi 6*) (either term, 2-0-4). The therapeutic process including basic assessment and treatment skills common to the rehabilitation practitioner. Prerequisites: REHAB 282, 283.

#### REHAB 351 Neuroanatomy

★3 (*fi 6*) (either term, 3-0-0). A detailed study of the structure and function of the human nervous system. Prerequisite: REHAB 283. Corequisite: PHYSYL 161.

#### REHAB 352 Work Physiology for Rehabilitation Therapists

★3 (*fi 6*) (either term, 3-0-2/2). The acute and chronic physiological response to pathology and levels of physical activity in individuals seen by the rehabilitation team and their treatment. Prerequisite: PHSYL 161 or equivalent. Note: Labs of two hours each will be offered to two groups of students on alternate weeks. All Occupational Therapy students obtaining Advance Standing or Advance Placement must attend lab section.

#### REHAB 353 Neuroscience for Rehabilitation

★3 (*fi 6*) (either term, 3-0-0). The mechanisms of neural activity and signalling, the functional aspects and integrative actions of sensory and motor systems and the neuroscience of higher cognitive functions will be covered. Emphasis will be on integration and function. Prerequisite: REHAB 351.

#### REHAB 354 Clinical Neurology

★3 (*fi 6*) (either term, 3-0-0). An overview of neurological conditions which are referred to rehabilitation therapists for treatment. Corequisite: REHAB 353.

#### REHAB 462 Research in Rehabilitation

★3 (*fi 6*) (either term, 3-0-0). The theory and principles of scientific method and research design procedures, and their application to rehabilitation in laboratory and clinical settings.

#### REHAB 463 Aging and Rehabilitation

★3 (*fi 6*) (either term, 0-3s-0). A seminar course addressing topics on age-related changes, pathology, health promotion, and the continuum of health and social services as they relate to rehabilitation of older adults.

#### REHAB 464 Administration

★3 (*fi 6*) (either term, 2-1s-0). An introduction to health care policy and delivery and business administration in rehabilitation.

#### REHAB 476 Ergonomics

★3 (*fi 6*) (either term, 2-0-1). Ergonomics from an industrial and health care perspective.

#### REHAB 486 Rehabilitation for Rheumatic Diseases

★3 (*fi 6*) (either term, 0-3s-0). An advanced course on rehabilitation of persons with rheumatic diseases. In-depth look at the theoretical and clinical basis for rehabilitation assessment and treatment of selected rheumatic diseases, and the practical application of these principles.

#### REHAB 498 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.

## Graduate Courses

#### REHAB 500 Research Seminar

★3 (*fi 6*) (either term, 0-3s-0). The examination, evaluation and preparation of



the research report. Students will discuss critically various aspects including 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 included. Prerequisites: A background in assistive technologies such as provided by OCCTH 312, PHER 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 550 Advanced Topics in Common Spinal Disorders

★3 (fi 6) (either term, 0-3s-0). Seminar on the current state of knowledge and controversies related to the prevention, assessment and management of common conditions affect the spine. Open to graduate students in Master's and PhD degree programs in the Faculty of Rehabilitation Medicine and to suitably prepared graduate students from other disciplines, with the consent of the Instructor.

#### 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 602 Advanced Seminars in Theory Based Interventions

★3 (fi 6) (either term, 0-3s-0). A seminar course providing an in-depth discussion of the critical role of theory and hypothesis testing in the development of intervention techniques in rehabilitation. New, innovative intervention strategies will be developed based on rehabilitation science theory.

#### 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.

## 201.192 Religious Studies, RELIG

Department of Comparative Literature, Religion, and  
FilmMedia Studies  
Faculty of Arts

**Note:** Students who have completed RELIG 100 may substitute that course for RELIG 101 for prerequisite purposes.

### Undergraduate Courses

#### 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.

#### RELIG 200 The Study of Religion

★3 (fi 6) (either term, 3-0-0). An introduction to the discipline of Religious Studies. Not open to students who have successfully completed RELIG 106.

#### 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. Formerly HEB 100.

#### 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. Note: Not open to students with credit in RELIG 231.

#### 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. Note: Not open to students with credit in RELIG 235.

#### RELIG 210 Introduction to the Traditions of Christianity

★3 (fi 6) (either term, 3-0-0). An exploration of the various strands of Christian thought, development of the churches, and religious experience throughout history.

#### RELIG 211 Introduction to the New Testament

★3 (fi 6) (either term, 3-0-0). An introduction to the social setting and critical study of the New Testament, the shaping of the traditions concerning the life and teaching of Jesus of Nazareth, and the formation of the early church.

#### 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.

#### 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. Note: Not open to students with credit in RELIG 208 or 301.

#### 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.

#### RELIG 244 Buddhism and the Modern World

★3 (fi 6) (either term, 3-0-0). An examination of such issues as Buddhism in the West, the transformation of Buddhism under the challenge of colonialism and of modernity; contemporary Buddhist thinkers. Prerequisite: RELIG 101, or 106, or 240, or consent of Department.

#### RELIG 252 Introduction to Confucianism

★3 (fi 6) (either term, 3-0-0). An historical and thematic study of the Confucian tradition in China, Korea, and Japan. Closer attention will be given to the Confucian texts in translation.

#### RELIG 254 Introduction to Taoism

★3 (fi 6) (either term, 3-0-0). A study of the history and structure of Taoism, and of this influence on the life, thought, and culture of the Chinese people.

#### RELIG 270 Contemporary Issues in Religion

★3 (fi 6) (either term, 3-0-0).

#### RELIG 272 Concepts of the Divine

★3 (fi 6) (either term, 3-0-0). A discussion of the diverse images and concepts of the divine, and their critical and comparative analysis. Note: Not open to students with credit in RELIG 260.

#### RELIG 273 Foundational Texts

★3 (fi 6) (either term, 3-0-0). Introduction to religious and literary texts which are the foundation of different cultures. The syllabus of the course will vary from year to year and reflect religious, literary, and cultural perspectives; the modular teaching units will include selected texts in translation. Prerequisites: C LIT 100 or ENGL 101 and RELIG 101 or 106, or consent of the Department.

#### RELIG 274 Witchcraft and the Occult

★3 (fi 6) (either term, 3-0-0). A survey of the occult traditions of the past, and of their role in the formation of modern paganism; the witch craze and its modern adaptation.

#### 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.

#### RELIG 279 Religion and Literature

★3 (fi 6) (either term, 3-0-0). A discussion of selected works of literature that express and articulate religious experiences. The range of selected works, varying from year to year, may contain specimens from the classical ages to the present, and from Asian to North American cultures (e.g. Dostojewski, H Hesse, U Le Guin).

#### RELIG 285 Religions of Western Canada

★3 (fi 6) (either term, 3-0-0). A survey of the history, structure, and socio-cultural impact of religious groups in Western Canada.

#### RELIG 290 Readings of Sacred Texts of Asia in the Original Language I

★3 (fi 6) (either term, 3-0-0). Introductory readings of the sacred texts of Asia in any one of the sacred languages of Asian religions.

#### RELIG 301 Readings in Hebrew Literature

★3 (fi 6) (two term, 3-0-0). Readings in Hebrew literature of religious character.

Prerequisite: RELIG 201 or consent of Department. Note: Only one of RELIG 301 or C LIT 490 can be taken for credit.

**0 RELIG 302 Studies in the Old Testament/Hebrew Bible**  
★3 (fi 6) (either term, 3-0-0). An intermediate level study of the Old Testament/Hebrew Bible, focusing on a variety of genres and critical approaches.

**0 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.

**0 RELIG 313 The Early Christian Community**  
★3 (fi 6) (either term, 3-0-0). A study of the communities that created the New Testament in their social and literary context. Not open to students who have successfully completed RELIG 310 or 311.

**0 RELIG 315 Christianity in the Age of the Reformation**  
★3 (fi 6) (either term, 3-0-0). A study of the main thinkers of the Reformation. Prerequisite: RELIG 101, or 106, or 210, or consent of Department.

**0 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.

**0 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.

**0 RELIG 331 Devotional Hinduism (bhakti)**  
★3 (fi 6) (either term, 3-0-0). A study of the various strands of devotional and mystical Hinduism (such as Vishnuism, Shivaism, Shaktism). Prerequisite: RELIG 101, or 106, or 230, or consent of Department.

**0 RELIG 337 Contemporary Hinduism**  
★3 (fi 6) (either term, 3-0-0). A critical examination of the responses of Hinduism to the challenges of colonialism, modernity, and religious pluralism, and of its ensuant transformation. Prerequisite: RELIG 101, or 106, or 230, or consent of Department.

**0 RELIG 343 Zen/Ch'an Buddhism**  
★3 (fi 6) (either term, 3-0-0). A study of the history of Zen/Ch'an Buddhism in China, Tibet, and Japan in terms on the major movements, their main figures, and samples of the representative texts. Prerequisites: RELIG 240 or consent of Department.

**0 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. Prerequisite: RELIG 101, or 106, or 240, or 342, or consent of Department.

**0 RELIG 375 Thanatology**  
★3 (fi 6) (either term, 3-0-0). A consideration of death and dying in the great religious traditions, with particular emphasis on the recent literature.

**0 RELIG 376 Comparative Studies in Religious Mythology**  
★3 (fi 6) (either term, 3-0-0). An introduction to the modern study of religious mythology in several cultures. Focus on some major mythic themes such as creation, origin of death, etc. Note: Not open to students with credit in RELIG 365.

**0 RELIG 377 Images of the Feminine in the Religious Traditions**  
★3 (fi 6) (either term, 3-0-0). An examination of the patterns and paradigms that formed and informed the image of the feminine in the religious traditions of the East and the West, both past and present (i.e. the goddess, the ultimate, and the roles of saintly women). Prerequisite: RELIG 101, or 106, or 277, or consent of Department.

**0 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.

**0 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.

**0 RELIG 390 Readings of Sacred Texts of Asia in the Original Language II**  
★3 (fi 6) (either term, 3-0-0). Intermediate readings of the sacred texts of Asia in any one of the sacred languages of Asian religions.

**0 RELIG 402 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 Department. Note: Not open to students with credit in RELIG 430 and only one of RELIG 402/404 or C LIT 518 can be taken for credit.

**0 RELIG 404 Advanced Studies in Hebrew Bible**  
★3 (fi 6) (either term, 3-0-0). Prerequisite: One course in Old Testament/Hebrew

Bible or consent of Department. Note: Only one of RELIG 402/404 or C LIT 518 can be taken for credit.

**0 RELIG 415 Advanced Studies in Christianity**  
★3 (fi 6) (either term, 3-0-0). Prerequisite: RELIG 101, or 106, or 210, or consent of Department.

**0 RELIG 422 Advanced Studies in Islam**  
★3 (fi 6) (either term, 3-0-0). Prerequisite: RELIG 101, or 220, or consent of Department.

**0 RELIG 440 Tantric Buddhism**  
★3 (fi 6) (either term, 3-0-0). An historical and thematic examination of the various traditions of tantric Buddhism in India and Tibet; a reading of some of the tantric texts in English translation. Prerequisite: RELIG 101, or 106, or 240, or 342, or 344, or consent of Department.

**0 RELIG 442 Advanced Studies in Buddhism**  
★3 (fi 6) (either term, 3-0-0). Prerequisite: RELIG 101, or 106, or 240, or 342, or 344, or consent of Department.

**0 RELIG 450 Advanced Studies in East Asian Religions**  
★3 (fi 6) (either term, 3-0-0). Prerequisite: RELIG 252, or 254, or 343, or 350 or consent of Department.

**0 RELIG 470 Scriptures and Oral Texts**  
★3 (fi 6) (either term, 3-0-0). A study of the religious phenomenon of scripture (written and oral), its use in structuring religious communities, and an examination of some of the scriptures themselves. Prerequisite: RELIG 101, or 106, or consent of Department.

**0 RELIG 472 Mysticism: East and West**  
★3 (fi 6) (either term, 3-0-0). An examination of the expressions of mystical experiences in various religions, and an exploration of what constitutes these experiences to develop an informed and critical sensitivity towards the claims of the mystics.

**0 RELIG 474 Religion and Psychoanalysis**  
★3 (fi 6) (either term, 3-0-0). A study of the impact of psychoanalysis on religious studies, with special reference to feminist psychoanalysis (e.g. Kristeva, Irigaray, Cixous) and the Kleinian school. Material to be studied would include both the classic texts of religious traditions and the phenomenology of actual religious communities. Prerequisite: ★6 at the 300-level in any relevant program, as approved by Department.

**0 RELIG 475 Methodology in Religious Studies**  
★3 (fi 6) (either term, 3-0-0). The study of works by Malinowski, Eliade, Jung, WC Smith, etc. representing different approaches to the study of human religiousness. Prerequisite: Open to Religious Studies Major and Honor students who have completed at least one 300-level course, or consent of Department.

**RELIG 480 Directed Reading in Religious Studies**  
★3-6 (variable) (variable, 3-0-0). Prerequisite: consent of Department.

**RELIG 501 Honors Essay in Religious Studies**  
★6 (fi 12) (two term, 0-3s-0). Preparation of the Honors essay.

## Graduate Courses

**RELIG 500 Seminar on World Religions**  
★6 (fi 12) (two term, 0-3s-0). Advanced seminar on world religions that includes the study of the teaching of world religions at the undergraduate level.

**RELIG 502 Specialized Studies in Hebrew Bible/Old Testament**  
★3 (fi 6) (either term, 3-0-0). Detailed studies of the individual books on the Hebrew Bible/Old Testament and related themes not requiring competence in the original languages.

**RELIG 504 Specialized Studies in Hebrew Bible/Old Testament Text in the Original Language**  
★3 (fi 6) (either term, 3-0-0). Requires competence in Biblical Hebrew.

**RELIG 505 Specialized Studies in Biblical Texts**  
★3 (fi 6) (either term, 3-0-0). An in-depth study of selected Biblical texts in the original language.

**0 RELIG 510 Selected Topics in Religious Studies**  
★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 540 Specialized Studies in Tibetan Buddhism**  
★3 (fi 6) (either term, 3-0-0). The course addresses the problems of academic study of Tibetan Buddhism and it does not require competence in Tibetan language.

**RELIG 545 Specialized Studies in Tibetan Texts**  
★3 (fi 6) (either term, 3-0-0). An in-depth reading of Tibetan Buddhist texts in Tibetan and their explication.

**RELIG 574 Advanced Studies in Religion and Psychoanalysis**

★3 (fi 6) (either term, 3-0-0).

**RELIG 575 Advanced Studies: Methodologies of Religious Studies**

★3 (fi 6) (either term, 3-0-0).

**RELIG 580 Directed Reading Course I**

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

**RELIG 581 Directed Reading Course II**

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

**201.193 Renewable Resources, REN R**Department of Renewable Resources  
Faculty of Agriculture, Forestry, and Home Economics

**Note:** See also Agricultural Economics (AG EC), 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 tables lists renumbered courses effective 1996/97:

Old	New	Old	New
ENCS 485	REN R 485	FOR 490	REN R 490
FOR 110	REN R 110	FOR 601	REN R 601
FOR 120	REN R 120	FOR 602	REN R 602
FOR 321	REN R 321	LDRES 410	REN R 410
FOR 420	REN R 420	LDRES 510	REN R 510
FOR 421	REN R 421	LDRES 590	REN R 590
FOR 430	REN R 430	SOILS 425	REN R 425
FOR 439	REN R 439	SOILS 545	REN R 545
FOR 475	REN R 475		

**Undergraduate Courses****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 a variety of wildland resources including: timber, water, range, wildlife, and recreation.

**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. This course requires the payment of additional miscellaneous fees. See §22.2.3 for details.

**REN R 220 Woody Plants II**

★3 (fi 6) (first term, 3-0-3). Developmental morphology and anatomy of woody plants; cell and tissue structure; biology of reproduction with the elements of genetics; relationship between form, function, and environment.

**REN R 321 Tree Physiology**

★3 (fi 6) (second term, 3-0-3). Study of physiological processes in trees. Emphasis on primary and secondary metabolism, gas exchange, transport processes, growth, and environmental effects. Prerequisites: BOT 199 or REN R 220; or BIOL 107 and BIOL 108.

**REN R 401 Special Topics in Renewable Resources**

★3 (fi 6) (either term, 3-0-0). Studies in the multiple aspects of renewable resources, for example wildlife, recreation, watershed and range. Prerequisite: consent of Instructor.

**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; application to renewable resource inventory and management and environmental impact assessment. Prerequisite: A 300-level course in at least one of the natural sciences.

**REN R 420 Advanced Dendrology**

★3 (fi 6) (second term, 3-0-0). Studies of woody plant vegetation of the world, especially temperate and boreal regions; evolution of, and genetic relationships among, tree and shrub genera and species; historical development of woody plant vegetation; optional field trip. Prerequisite: consent of Instructor. Offered alternate years.

**REN R 421 Advanced Tree Physiology**

★3 (fi 6) (first 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. Offered in alternate years.

**REN R 425 Land Evaluation**

★3 (fi 6) (second term, 3-0-3). Principles and techniques of land evaluation

including land classification based on inherent characteristics, (soils, landform, ecological units), present land use/land cover, and land capabilities for alternate land use; assessment of land quality based on specific landscape characteristics using spatial and land information systems; sources of digital and hard copy land information. Prerequisites: A 300-level earth science course and consent of Instructor.

**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. Prerequisite: EAS 221, REN R 425, or consent of Instructor.

**REN R 430 Forest Resources Management**

★3 (fi 6) (second 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. Prerequisites: FOREC 345 required; FOR 210 strongly recommended.

**REN R 439 Forest Management Planning**

★3 (fi 6) (first term, 0-3s-0). Seminar presentations and discussions by students of contemporary forest management planning. Prerequisite: REN R 430.

**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 475 Vegetative Reclamation, Revegetation and Restoration**

★3 (fi 6) (second term, 3-0-3). Principles, practices and philosophy of vegetative reclamation; revegetation and restoration of disturbed lands; ecology and plant succession of these lands. Topics include site preparation, seed mix design, planting methods, species selection, monitoring, determining success. Illustrated with case studies. Prerequisites: ★60 at the university level, an introductory course in plant ecology; knowledge of plant taxonomy desirable.

**REN R 477 Wildlife-Human Activities: Conflicts, Assessment and Mitigation**

★3 (fi 6) (second term, 3-0-0). Behavioral and ecological responses of wildlife species to human activities, including forestry operations, oil and gas exploration, recreational developments and agriculture-related activities. Topics include harassment and disturbance, habitat loss, habituation, assessment of impacts and mitigation, and cumulative impacts. Identification of ecological and social issues associated with human activities. Prerequisite: third- or fourth-year standing.

**REN R 485 Land Reclamation**

★3 (fi 6) (first term, 3-3s-0). Principles and practices of land reclamation; types of land disturbances and regulations governing their reclamation; land reclamation case studies. Students will develop a reclamation plan. Prerequisite: ★60 at the university level with at least ★6 in biophysical courses.

**REN R 490 Forest Tree Improvement**

★3 (fi 6) (second term, 3-0-3). Application of principles of inheritance as related to trees and in the management of forested lands; natural variation and ecological differentiation of woody plant populations; reproductive biology; methods of tree improvement. Prerequisite: consent of Instructor.

**Graduate Courses****REN R 510 Advanced Remote Sensing**

★3 (fi 6) (second term, 3-0-3). A quantitative approach to remote sensing for land resource studies; specialized techniques for hard copy and digital image analyses; remote sensing and soil-vegetation-landscape models; literature review and laboratory project on a selected problem. Prerequisite: REN R 410.

**REN R 545 Small Watershed Hydrology**

★3 (fi 6) (second term, 0-3s-0). An examination of land use and management practices affecting water quantity and quality in rural watersheds. Consideration 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 561 Agroecosystem Simulation**

★3 (fi 6) (first term, 3-0-3). The student will learn the rationale for integrating scientific findings at lower levels of physical and biological organization into mathematical models. The students will learn to simulate basic processes in the physics, chemistry, and biology of soils and plants, and to integrate these processes into higher-level agroecosystem models. Offered in alternate years. Prerequisites: A course in earth sciences and a course in plant sciences plus completion of ★90 of university-level course work. Credit cannot be obtained for both SOILS 561 and REN R 561.

**REN R 575 Advanced Vegetative Reclamation**

★3 (fi 6) (first term, 0-3s-0). A seminar course addressing current topics in

vegetative reclamation, revegetation and restoration of disturbed lands; topics include plant response to disturbed ecosystems, succession in disturbed ecosystems, reclamation properties of plants. Prerequisite: consent of Instructor. 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 experimental design, analysis of variance and covariance, and categorical data analysis. Prerequisite: ★90 of university-level coursework or higher. ★3 in introductory statistics recommended.

**REN R 590 Research Methods for Land Resource Science**

★3 (fi 6) (first term, 3-0-3). Fundamentals of experimental design, data analysis, and sampling techniques for natural and disturbed soils. Lectures emphasize classical- and geo-statistical methods. Labs provide opportunity to learn statistical software packages. Prerequisite: Graduate students or consent of Instructor.

**REN R 600 Graduate Research Seminar**

★2 (fi 4) (two term, 0.5-0.5s-0). Prepares graduate students to function in a research environment. Formal lectures during the first two months of Fall. Student presentations and student evaluations of them take place during the remainder of Fall and all of Winter. All graduate students in the Department of Renewable Resources who are on campus are expected to attend and provide evaluations of student presentations on alternate weeks; attendance at the formal lectures is required only once, and should be during the first year of graduate study. Registration is normally in the last year of the program; the grade is credit/no credit.

**REN R 601 Forest Biology**

★3 (fi 6) (second 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) (first 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.

## 201.194 Rural Sociology, R SOC

Department of Rural Economy  
Faculty of Agriculture, Forestry, and Home Economics

**Note:** See also INT D 356 and 456 for courses which are offered jointly with the Department of Sociology and which may be taken as options or as courses in this discipline.

### Undergraduate Courses

**R SOC 310 Women in Development**

★3 (fi 6) (either term, 3-0-0). This course deals with development issues, such as work, health, environment, and human rights among women in developing countries. Prerequisite: consent of Department. Not available to students with credit in W ST 310.

**R SOC 355 Principles of Rural Sociology**

★3 (fi 6) (either term, 3-0-0). The basic principles and concepts of sociology as they apply to the study of rural life; concepts of culture, social organization, population and ecology, and social institutions are taught with rural examples. Prerequisite: ★30 or more. Note: R SOC 355 is acceptable in lieu of SOC 100 as a prerequisite for senior-level sociology courses for Faculty of Agriculture, Forestry, and Home Economics students only.

**R SOC 391 Principles of Rural Extension**

★3 (fi 6) (either term, 3-0-0). Introduction to concepts involved in organizing and implementing effective programs for social change in rural communities. The processes by which farm and rural people learn about, try out and adopt or reject new ideas and innovations. Development of an appreciation for the multidisciplinary nature of the rural extension function. Prerequisite: Third-year standing or higher.

**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 450 Environmental Sociology**

★3 (fi 6) (either 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: R SOC 415, 491.

**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. Note: May be repeated for credit one time. Prerequisite: consent of the Department Chair.

**R SOC 556 Human Resources Development**

★3 (fi 6) (either term, 3-0-0). The role of human resources in social and economic development. Strategies for development of knowledge; skills and attitudes desirable in the development process. Training of change agents and lay leaders for community development and continuing education process. Prerequisite: consent of Instructor.

**R SOC 557 Comparative Rural Societies**

★3 (fi 6) (either term, 3-0-0). The structure and characteristics of rural societies in various countries, with emphasis upon adjustment to change in social and economic institutions. Prerequisite: consent of Instructor; INT D 456 recommended.

**R SOC 900 Directed Research Project**

★3 (fi 6) (variable, unassigned).

## 201.195 Russian, RUSS

Department of Modern Languages and Cultural Studies:  
Germanic, Romance, Slavic  
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, or they may be encouraged to seek "Credit by Special Assessment" (see \$44.5) where 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 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 Slavic and East European Studies.
- (5) RUSS 100 and 160 are not open to students with credit in matriculation-level Russian.
- (6) See also INT D courses offered by the Faculty of Arts.

### Undergraduate Courses

**RUSS 100 Beginners' Russian**

★6 (fi 12) (two term, 3-0-2). Essentials of grammar, reading, and pronunciation. Designed to give a working knowledge of the Russian language.

**RUSS 170 Business Russian for Beginners**

★6 (fi 12) (two term, 3-0-1). An introduction to the grammar, vocabulary, conversational, and comprehension skills needed to conduct business in Russian. Note: Not open to students with credit in RUSS 100 or 160.

**RUSS 201 Second-Year Russian I**

★3 (fi 6) (first term, 3-0-1). Russian grammar, composition, oral practice. Prerequisite: RUSS 100 or consent of Department. Formerly RUSS 303.

**RUSS 202 Second-Year Russian II**

★3 (fi 6) (second term, 3-0-1). This course is a continuation of RUSS 201. Prerequisite: RUSS 201. Formerly RUSS 304.

**RUSS 215 Assisted Readings I**

★3 (fi 6) (first term, 3-0-0). Introduction to the study of Russian literature in the original. Assisted reading and analysis of selected texts from pre-20th century Russian literature. Prerequisite or corequisite: RUSS 201 or consent of Department. Formerly RUSS 315.

**0 RUSS 216 Assisted Readings II**

★3 (*fi 6*) (second term, 3-0-0). Assisted reading and analysis of selected texts from 20th-century Russian literature. Prerequisites or corequisites: RUSS 202 and RUSS 215 or consent of Department. Formerly RUSS 316.

**0 RUSS 253 Russian Phonetics**

★3 (*fi 6*) (either term, 3-0-0). An introduction to the sound system of Russian and its relationship to the standard orthography of the language. Prerequisite: RUSS 100.

**0 RUSS 271 Business Russian I: Informal Business Relations**

★3 (*fi 6*) (first term, 3-0-0). Theoretical and practical study of the more complex areas of Russian grammar. Readings and exercises in various styles of business and technical Russian: finances, marketing, legal documents. Practice in communication skills, vocabulary development. Prerequisite: RUSS 100 or 170.

**0 RUSS 272 Business Russian II: Formal Business Relations**

★3 (*fi 6*) (second term, 3-0-0). Reading, writing, and conversing in a variety of business settings. Course will cover modules in Business negotiations, correspondence, finances, contracts and legal documents, advertising, and business culture. Prerequisite: RUSS 100 or 170.

**0 RUSS 315 Russian Women's Writing in English Translation**

★3 (*fi 6*) (either term, 3-0-0). A survey of writing by women in Russia from the end of the 18th century to the post-Soviet present. The course will explore the refraction of women's experience in memoirs, poetry and prose. All readings will be in English translation.

**0 RUSS 320 Russian Literary Classics in Translation**

★3 (*fi 6*) (either term, 3-0-0). A study of selected works by the prominent Russian authors from Gogol to Solzhenitsyn. This course will not fulfil the Language other than English requirement of the BA degree.

**0 RUSS 323 Tolstoy and Dostoevsky in Translation**

★3 (*fi 6*) (either term, 3-0-0). An in-depth study of Russian literature's foremost novelists of the 19th century. This course will not fulfil the Language other than English requirement of the BA degree.

**0 RUSS 401 Third-Year Russian I**

★3 (*fi 6*) (either term, 3-0-0). Discussion of difficult grammatical points in Russian, vocabulary building, development of comprehension of spoken Russian. Prerequisite: RUSS 202 or consent of Department.

**0 RUSS 402 Third-Year Russian II**

★3 (*fi 6*) (either term, 3-0-0). This course is a continuation of RUSS 401, with greater emphasis on composition. Prerequisite: RUSS 401 or consent of Department.

**0 RUSS 406 Intensive Oral Russian**

★3 (*fi 6*) (either term, 3-0-0). Intensive conversation course. Prerequisite: RUSS 202 or consent of Department.

**0 RUSS 415 19th-Century Russian Literature**

★3 (*fi 6*) (either term, 3-0-0). Representative works of the 19th century, from Pushkin to Chekhov. Taught in English. Russian majors will do a significant part of the readings and assignments in Russian. Prerequisite for SEES majors only: RUSS 215, or 216, or consent of Department.

**0 RUSS 416 20th-Century Russian Literature**

★3 (*fi 6*) (either term, 3-0-0). Representative works from 1917 to the present from Gorky to 'glasnost.' Taught in English. Russian majors will do a significant part of the readings and assignments in Russian. Prerequisite for SEES majors only: RUSS 215, or 216, or consent of Department.

**0 RUSS 422 Russian Literature and the Arts**

★3 (*fi 6*) (either term, 3-0-0). A study of the interrelationship between literature and other media: theatre, cinema, and the visual arts. The emphasis will vary from year to year. Prerequisite or corequisite: RUSS 401 or consent of Department.

**0 RUSS 424 Russian Contemporary Theatre**

★3 (*fi 6*) (either term, 3-0-0). A study of glasnost and post-glasnost theatre. The course examines several experimental productions including among others *Dr Zhivago*, *The Clown School*, *Nijinsky*, *Adventure*, etc. Students will be shown videotapes and slides relating to texts studied. No prerequisite.

**0 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 202, or consent of Department. Not open to students with credit in RUSS 441 or 442.

**0 RUSS 444 English-Russian Translation**

★3 (*fi 6*) (either term, 3-0-0). Exercises in translation with emphasis on both literary and non-literary texts. Prerequisite: RUSS 202, or consent of Department. Not open to students with credit in RUSS 441 or 442. Not recommended for students with native knowledge of Russian.

**0 RUSS 454 Russian Morphology**

★3 (*fi 6*) (either term, 3-0-0). Study of the morphological system of Russian. Prerequisite: RUSS 253 (formerly RUSS 453) or consent of Department.

**0 RUSS 456 Russian Syntax**

★3 (*fi 6*) (either term, 3-0-0). Linguistic study of the syntactic system of Russian. Prerequisite: RUSS 202 or consent of Department.

**0 RUSS 479 Honors Thesis**

★3 (*fi 6*) (variable, 3-0-0). Directed Honors thesis research. Note: Required of all BA (Honors) students majoring in Russian who are in their final year of study.

**0 RUSS 482 Soviet Russian Literature**

★3 (*fi 6*) (either term, 3-0-0). A continuation of RUSS 481, this course will emphasize the thirties and the post-Stalinist period. Prerequisite: RUSS 481 or Corequisites: RUSS 401 and 402, or consent of Department.

**0 RUSS 498 Conference Course (Linguistics)**

★3-6 (*variable*) (variable, 3-0-0). Students as well as staff may initiate proposals in any given year for the content of this course. Please consult the Department Chair for the procedure for student-initiated proposals.

**0 RUSS 499 Conference Course (Literature)**

★3-6 (*variable*) (variable, 3-0-0). Students as well as staff may initiate proposals in any given year for the content of this course. Please consult the Department Chair for the procedure for student-initiated proposals.

**Graduate Courses****0 RUSS 500 Reading Course**

★6 (*fi 12*) (two term, 3-0-0). This course is for graduate students who wish to satisfy the language requirement of their Department. An intensive study of essential grammar, reading of graded texts, and translation of texts from the student's own field. Note: Not open to undergraduates.

**0 RUSS 501 Composition and Conversation I**

★3 (*fi 6*) (either term, 3-0-0).

**0 RUSS 502 Composition and Conversation II**

★3 (*fi 6*) (either term, 3-0-0).

**0 RUSS 511 The Structure of Russian I: Syntax**

★3 (*fi 6*) (either term, 3-0-0).

**0 RUSS 512 The Structure of Russian II: Phonology**

★3 (*fi 6*) (either term, 3-0-0).

**0 RUSS 516 Medieval Muscovite Literature**

★3 (*fi 6*) (either term, 3-0-0). Russian literature from the fourteenth century through the seventeenth.

**0 RUSS 551 18th-Century Russian Literature and Culture**

★3 (*fi 6*) (either term, 3-0-0). Russian literature during the century of Russia's Europeanization.

**0 RUSS 555 Teaching Strategies for Postsecondary Language Instructors of Russian**

★3 (*fi 6*) (first term, 3-0-0). Designed to help graduate teaching assistants develop practical expertise in the instruction of Russian at the college and university levels.

**0 RUSS 571 History of Russian Criticism**

★3 (*fi 6*) (either term, 3-0-0). A detailed study with emphasis on the 19th and 20th centuries.

**0 RUSS 572 Russian Literary Theory**

★3 (*fi 6*) (either term, 3-0-0). A detailed study with emphasis on formalism and realism.

**0 RUSS 641 Studies in Russian Poetry**

★3 (*fi 6*) (either term, 3-0-0).

**0 RUSS 643 Studies in Russian Realism**

★3 (*fi 6*) (either term, 3-0-0).

**0 RUSS 645 Studies in Soviet Russian Literature**

★3 (*fi 6*) (either term, 3-0-0).

**0 RUSS 647 Aspects of Modernism in Russian Literature**

★3 (*fi 6*) (either term, 3-0-0). This course is designed to deal with the various aspects of the literary movements generally known as Symbolism and Decadence.

**0 RUSS 697 Conference Course (Folklore)**

★3-6 (*variable*) (variable, 3-0-0). A detailed study of a folklore problem or genre not dealt with in the other courses. Designed to meet the needs of individual graduate students.

**0 RUSS 698 Conference Course (Linguistics)**

★3-6 (*variable*) (variable, 3-0-0). A detailed study of an area of Russian linguistics not dealt with in the other Honors or graduate courses. May be initiated by either staff or students as need arises.

**0 RUSS 699 Conference Course (Literature)**

★3-6 (*variable*) (variable, 3-0-0). A detailed study of a literary problem, period or genre not dealt with in the other Honors or graduate courses. Designed to meet the needs of individual Honors or graduate students.

## 201.196 Scandinavian, SCAND

Department of Modern Languages and Cultural Studies:  
Germanic, Romance, Slavic  
Faculty of Arts

**Note:** See also Norwegian (NORW) and Swedish (SWED) listings.

The following table lists renumbered courses effective 1990/91:

Old	New	Old	New
SCAND 100	NORW 100	SCAND 300	NORW 200
SCAND 101	SWED 100	SCAND 301	SWED 200

### Undergraduate Courses

#### 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.

#### 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.

#### 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.

#### 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.

#### 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 fulfill 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 fulfill the language-other-than-English requirement of the BA degree.

#### 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: NORW 200, or SWED 200, 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: NORW 200, or SWED 200, or consent of Department.

#### SCAND 450 History of the Scandinavian Languages

★6 (fi 12) (two term, 3-0-0). After a brief survey of Old Norse, runic inscriptions will be examined, and then the development of the modern Scandinavian languages and their main dialects will be traced from the beginnings to the present. Note: Not to be taken by students with credit in SCAND 405. Prerequisite: NORW 200, or SWED 200, or consent of Department.

#### SCAND 498 Special Topics in Scandinavian Languages and Literatures

★3-6 (variable) (variable, 3-0-0).

#### SCAND 499 Conference Course

★3-6 (variable) (variable, 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.

## 201.197 Science, SCI

Faculty of Science

### Undergraduate Courses

#### SCI 300 Communications

★3 (fi 6) (either term, 3-0-3). This course is designed to provide science students with the skills necessary to perform well and be successful in the workforce. Prerequisite: Year 3 standing in the BSc General program.

## 201.198 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. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour POL S 100 à la Faculté des Arts. Anciennement SC PO 201.

#### SC PO 102 Introduction à la politique

★3 (fi 6) (deuxième semestre, 3-0-0). Une introduction au développement de la tradition démocratique. Sujets étudiés: pouvoir ou influence, démocratie, droits et libertés, idéologie politique, opinion publique, élections, partis politiques, groupes de pression et autres sujets choisis. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour POL S 100 à la Faculté des Arts. Anciennement SC PO 202.

#### SC PO 220 Gouvernement et politique du Canada en tant que nation

★6 (fi 12) (aux deux semestres, 3-0-0). Structures et fonctions du Gouvernement du Canada et en particulier les Communes, le Sénat, le Cabinet, la Fonction publique, les partis politiques. Note: ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits 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 couvre les causes de la guerre, l'impérialisme, et le rôle des acteurs non-étatiques.

#### 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 290 Comportement politique

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction à l'approche behavioraliste en science politique et à son application dans certains domaines de recherches.

#### SC PO 350 Femmes et politiques

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Introduction aux rôles traditionnels et nouveaux des femmes dans les structures et les processus politiques. Le cours est principalement axé sur le Canada. Prérequis: SC PO 220 or SC SOC 312, ou l'accord du Vice-doyen aux affaires académiques.

#### SC PO 378 Langue et politique

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude des rapports entre langue et politique et surtout des différentes stratégies en matière de langue adoptées par l'État moderne. Introduction aux domaines d'aménagement linguistique, de droit linguistique et de politolinguistique. Un accent particulier est mis sur l'État plurilingue. Note: Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en SC PO 388.

#### SC PO 391 Partis politiques au Canada

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Sujets étudiés: systèmes de partis, idéologies et programmes, adhérents et sympathisants, organisation et ressources, activités électorales et gouvernementales. Prérequis: SC PO 220 ou l'accord du Vice-doyen aux affaires académiques.

**SC PO 421 Thèmes en politique canadienne**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude de thèmes en politique et gouvernement canadiens. Le contenu varie d'une année à l'autre. Prérequis: SC PO 220 ou l'accord du Vice-doyen aux affaires académiques.

**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. Prérequis: SC PO 220 ou l'accord du Vice-doyen aux affaires académiques.

**SC PO 424 Comportement politique au Canada**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Une approche behavioriste à l'étude des activités législatives, partisanes et électorales au Canada. Prérequis: SC PO 220 ou 290 ou l'accord du Vice-doyen aux affaires académiques.

**SC PO 425 Administration publique au Canada**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). La théorie de l'administration publique et son application actuelle dans divers domaines de gouvernement au Canada: relations fédérale-provinciale, planification et finances, relations humaines et gestion du personnel. Prérequis: SC PO 220 ou l'accord 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. Prérequis: SC PO 220 ou POL S 221, ou l'accord 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. Prérequis: accord du Vice-doyen aux affaires académiques.

**201.199 Sciences sociales, SCSOC**

Faculté Saint-Jean

The following course was renumbered effective 1999/2000:

Old	New
SCSOC 321	SCSOC 225

**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. Note: Ce cours faisait partie de SCSOC 310. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour PHIL 333 ou POL S 210.

**SCSOC 312 Histoire de la pensée politique et sociale II**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Etude des principaux aspects de la pensée politique et sociale du XVIIe 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. Note: Ce cours faisait partie de SCSOC 310. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour PHIL 334, POL S 210 ou SOC 332.

**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. Prérequis: Mathématiques pures 30 et SCSOC 321 ou l'accord du Vice-doyen aux affaires académiques. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour POL S 316, PSYCE 211, SOC 210, STATQ 141, STAT 155, 235, 236, 237 ou 255.

**SCSOC 401 Concepts en sciences sociales**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Analyse interdisciplinaire de concepts fondamentaux utilisés pour étudier la personne et les sociétés humaines, comme

la culture, le langage, l'ethnie, l'autorité, l'idéologie, la classe, l'organisation, l'espace, la cognition, la production et la pénurie.

**SCSOC 431 Modèles d'interprétation des révolutions**

★3 (fi 6) (l'un ou l'autre semestre, 0-3s-0). Etude de modèles interprétatifs des révolutions de 1642-49 et 1688, 1789 et 1917. L'approche est multidisciplinaire et s'inspire de la sociologie historique contemporaine. Les oeuvres de Laurence Stone, Theda Skocpol, Barrington Moore, Robert Merton, Robert Nisbet et Talcott Parsons serviront de références essentielles pour établir des modèles structurels d'interprétation d'événements qui ont bouleversé le monde occidental.

**SCSOC 450 Choix de sujets en sciences sociales**

★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. Prérequis: ★3 de niveau 300 or 400 en ETCAN, HISTE, SC PO, SCSOC, ou SOCIE.

**Cours de 2e cycle****SCSOC 590 Sujets spéciaux en sciences sociales**

★3 (fi 6) (l'un ou l'autre semestre, 0-3s-0).

**201.200 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.

**201.201 Slavic and East European Studies, SLAV**

Department of Modern Languages and Cultural Studies:  
Germanic, Romance, Slavic  
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 East European and Soviet Studies listing.
- (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), Political Science (POL S), and Sociology (SOC).
- (4) See also INT D 101, 102, 346, 347, 439, 443, 444, 445, 447, 479, 487, and 499 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****SLAV 403 The Modern Slavic Languages in Their Historical Setting**

★3 (fi 6) (either term, 3-0-0). An investigation of the development of Proto-Slavic from its Indo-European origin until its disintegration into those dialects which form the basis of the modern Slavic literary languages. Prerequisite: At least one year of a Slavic language.

**SLAV 420 Old Church Slavonic I**

★3 (fi 6) (either term, 3-0-0). An introduction to the grammar of the oldest Slavic texts, with selected readings. Prerequisite: RUSS 202 or UKR 150 or UKR 202 or POLSH 202 or consent of Department.

**SLAV 421 Old Church Slavonic II**

★3 (fi 6) (either term, 3-0-0). A continuation of SLAV 420. Prerequisite: SLAV 420.

**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.

**SLAV 498 Conference Course (Linguistics)**

★3-6 (variable) (variable, 3-0-0). Students as well as staff may initiate proposals in any given year for the content of this course. Please consult the Department Chair for the procedure for student-initiated proposals.

**SLAV 499 Conference Course (Literature/Folklore)**

★3-6 (variable) (variable, 3-0-0). Students as well as staff may initiate proposals in any given year for the content of this course. Please consult the Department Chair for the procedure for student-initiated proposals.

## Graduate Courses

**Note:** See also INT D 546 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.

### SLAV 515 Old East Slavic Literature

★3 (fi 6) (either term, 3-0-0). Survey of Old East Slavic literature up to the fourteenth century, with emphasis on literary documents from Kiev and Novgorod.

### SLAV 518 Comparative Slavic Linguistics

★3 (fi 6) (either term, 3-0-0).

### SLAV 522 Historical Grammar of East Slavic

★3-6 (fi 6) (either term, 3-0-0). Detailed discussion of some specific problems in the historical development of Russian, Ukrainian, and Byelorussian.

### SLAV 561 History of the West Slavic Languages

★3 (fi 6) (either term, 3-0-0).

### SLAV 562 History of the South Slavic Languages

★3 (fi 6) (either term, 3-0-0).

### SLAV 698 Conference Course (Linguistics)

★3-6 (variable) (variable, 3-0-0). A detailed study of an area of Slavic studies not dealt with in the other honors or graduate courses. May be initiated by either staff or students as need arises.

### SLAV 699 Conference Course (Literature)

★3-6 (variable) (variable, 3-0-0). A detailed study of a literary problem, period, or genre not dealt with in the other honors or graduate courses. Designed to meet the needs of individual honors or graduate students.

## 201.202 Sociologie, SOCIE

Faculté Saint-Jean

### Cours de 1er cycle

#### 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 procès 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. Anciennement SOCIE 200.

#### SOCIE 101 La société canadienne

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Le développement de la société canadienne: comprenant des sujets comme les rapports franco-anglais, le régionalisme, les rapports avec les États-Unis, les droits des autochtones, la mosaïque canadienne, les inégalités et les conflits. Prérequis: SOCIE 100 ou SOC 300. Note: Ce cours n'est pas accessible aux étudiants ayant des crédits pour SOCIE 322. Anciennement SOCIE 201.

#### 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.

#### 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. Prérequis: SOCIE 100 ou SOC 300. Anciennement SOCIE 360.

#### SOCIE 301 Sociologie des rapports de sexes

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Étude 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.

#### SOCIE 327 Administration de la justice pénale au Canada

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Caractéristiques fondamentales de l'appareil de justice pénale canadien et liens avec diverses agences sociales (police, tribunaux, prisons, médias) au sein de cet appareil. Analyse des problèmes auxquels peuvent faire face les personnes confrontées au système pénal. Examen des politiques publiques liées au crime et leur relation avec l'appareil pénal. Prérequis: SOCIE 225.

#### SOCIE 348 Sociologie des média et de l'information

★3 (variable) (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. Prérequis: SOCIE 100. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits en SOCIE 367. Cours à distance. Voir §200.

#### SOCIE 367 La connaissance et la société humaine

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Nature et évaluation de la connaissance (ex. valeurs et systèmes de croyances manifestes dans l'art, les sciences, la technologie) dans le contexte de régimes sociaux; le lien entre les systèmes rivaux de connaissance et l'évolution sociale. Prérequis: SOCIE 100 ou SOC 300.

#### 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. Étude de cas des relations entre les groupes ethniques et minoritaires fondée sur les travaux réalisés à l'échelle nationale. Prérequis: SOCIE 100 ou SOC 300.

#### SOCIE 371 La famille

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Le système familial vu dans le contexte de l'histoire et de la rencontre des cultures. Étude du système familial dans les sociétés contemporaines, soulignant les aspects caractéristiques de l'institution et ses tendances actuelles. Prérequis: SOCIE 100, 101, ou SC SOC 401

#### 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. Prérequis: SOCIE 101 ou SOC 300.

#### SOCIE 472 Choix de sujets: la société canadienne

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Prérequis: SOCIE 260 ou 372.

## 201.203 Sociology, SOC

Department of Sociology  
Faculty of Arts

**Note:** See also INT D 356, 393, 394, 456, and 475 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. Prerequisite: First or second year standing. Note: Not to be taken by students with credit in SOC 202 or 300. Third-year or more advanced students must take SOC 300. Formerly SOC 200.

#### 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. Prerequisite: One of SOC 100 or 300. Note: Not to be taken by students with credit in SOC 322. Formerly SOC 201.

#### SOC 102 Social Problems

★3 (fi 6) (either term, 3-0-0). The definition/development of social problems and an examination of selected structural issues in various societies, including inequality, population growth, environment, and human rights. Prerequisite: One of SOC 100 or 300. Formerly SOC 202.

#### SOC 205 Selected Topics in Sociology

★3 (fi 6) (either term, 3-0-0). Content varies from year to year. Topics announced prior to registration period.

#### 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 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. Formerly SOC 324.

#### 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. Formerly SOC 325.

#### SOC 231 Introduction to Theories of Society

★3 (fi 6) (either term, 3-0-0). Classical and contemporary perspectives on society



and human nature. Problems of comparing and assessing social theories, e.g. issues such as the individual versus society, idealism versus materialism, conflict versus consensus. Prerequisite: One of SOC 100 or 300. Note: Not to be taken by students with credit in SOC 332 or 333. SOC 231 is not to be taken by Sociology majors, as they are required to take SOC 332 and 333. Formerly SOC 331.

### **[O] 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, EDPSY 163 or 371. Note: SOC 241 and PSYCO 241 may not both be taken for credit. Formerly SOC 341.

### **[O] 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. Prerequisites: One of SOC 100 or 300; or PSYCO 104 or 105; or EDPY 200.

### **[O] SOC 251 Population and Society**

★3 (fi 6) (either term, 3-0-0). Population trends and problems in Canada and the rest of the world; social and cultural factors underlying fertility, mortality, and migration patterns; urbanization; population explosion, population theory, and policy concerns. Formerly SOC 351.

### **[O] 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. Formerly SOC 360.

### **[O] SOC 261 Social Organization**

★3 (fi 6) (either term, 3-0-0). Social systems, their components, interrelations, and the bases of social differentiation and integration. Prerequisite: One of SOC 100 or 300. Formerly SOC 361.

### **[O] 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. Note: Not available for credit for students with credit in FAM 110 or 215. Formerly SOC 371.

### **[O] SOC 300 Principles of Sociology**

★3 (fi 6) (either term, 3-0-0). Basic concepts and principles of Sociology for students with advanced standing. Prerequisite: Third-year or more advanced standing. Notes: May not be taken for credit by students with credit in SOC 100 or 202. First or second-year students must take SOC 100. Formerly SOC 403.

### **[O] 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.

### **[O] SOC 302 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 SOC 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.

### **[O] 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. Note: Not to be taken by students with credit in SOC 311.

### **[O] SOC 321 Juvenile Delinquency**

★3 (fi 6) (either term, 3-0-0). Juvenile delinquency and its relation to adult crime; the social processes involved in the genesis and perceptions of styles of delinquency and their relationship to the community, and to various current theories of prevention and control, including the role of institutions and law. Prerequisite: SOC 225. Formerly SOC 427.

### **[O] 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.

### **[O] SOC 332 The Development of Sociology I**

★3 (fi 6) (either term, 3-0-0). A survey of the origin and the development of classical sociological theory, with particular emphasis on Marx, Weber and Durkheim. Prerequisite: One of SOC 100 or 300. Note: Not to be taken by students with credit in SOC 231.

### **[O] SOC 333 The Development of Sociology II**

★3 (fi 6) (either term, 3-0-0). A survey of the contributions of modern and contemporary sociological theory, with particular emphasis on influential approaches such as symbolic interactionism, functionalism, conflict theory, critical theory, feminist theory, etc. Prerequisite: SOC 332. Note: Not to be taken by students with credit in SOC 231.

### **[O] 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.

### **[O] SOC 343 Collective Behavior**

★3 (fi 6) (either term, 3-0-0). Analysis of various forms of collective behavior, including crowds, mobs, social movements, and fugitive behavior patterns. Prerequisite: One of SOC 100 or 300 or 241, or PSYCO 241.

### **[O] SOC 344 Public Opinion and Mass Communication**

★3 (fi 6) (either term, 3-0-0). Factors involved in the formulation and assessment of public opinion; the role of the media in mass communication. Emphasis on Canadian society.

### **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.

### **[O] 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.

### **[O] SOC 353 Urban Sociology**

★3 (fi 6) (either term, 3-0-0). Social implications of urban life with respect to such topics as patterns of city growth; urban social organization (family, neighbourhood, community); urban social issues (housing, crime); urban policy and urban planning (sociology of planning, citizen participation). Prerequisite: One of SOC 100 or 300.

### **[O] 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.

### **[O] 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.

### **[O] 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.

### **[O] SOC 368 Canadian Ethnic and Minority Relations**

★3 (fi 6) (either term, 3-0-0). Analysis of social processes leading to the development and understanding of minority status: case studies of ethnic and minority-group relations, with reference to cross-national studies. Prerequisite: One of SOC 100 or 300.

### **[O] 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 101.

### **[O] 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.

### **[O] 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.

### **[O] 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. Note: Not available for credit for students with credit in FAM 321.

### **[O] 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, 202, 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 telephone 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. Note: Not an acceptable 400-level course when Sociology is taken as a second subject.

**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 telephone 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 telephone 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 311, or 210 and 315, or 313 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 311, or 210 and 315, or 313 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 424 Social Structure and Crime**

★3 (*fi 6*) (either term, 3-0-0). Theoretical and empirical analysis of the effects of such variables as urbanization, age, gender and class stratification, the community, and the economy on crime rates; consideration of cross-national differences. Prerequisite: SOC 225 and SOC 315.

**SOC 425 Research Problems in Criminology**

★3 (*fi 6*) (either term, 3-0-0). Examination of selected research issues in criminology, such as measurement of crime, research design, causal analysis and data interpretation. Prerequisite: SOC 225.

**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 Types of Crime**

★3 (*fi 6*) (either term, 3-0-0). Analysis of selected types of criminal behavior and typologies; social processes affecting criminal careers. Prerequisite: SOC 225.

**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 434 Contemporary Sociological Theory**

★3 (*fi 6*) (either term, 3-0-0). Current developments in sociological theory: concepts, recent contributions, and theoretical issues and controversies. Prerequisite: SOC 333.

**SOC 437 The Sociology of Knowledge**

★3 (*fi 6*) (either term, 3-0-0). Study of the hypothesis that the forms of social life condition knowledge. Analysis of the versions of this thesis offered by such scholars as: Vico, Marx-Engels, Nietzsche, Scheler, Pareto, Durkheim, Mannheim, and more recent writers. Assessment of their proposed solutions to the social limitations imposed on knowing. Prerequisite: One of SOC 231, 332, 333, 367 or equivalent.

**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 Advanced Mass Communications**

★3 (*fi 6*) (either term, 3-0-0). Empirical review of relationships between mass media, especially television, and public perception/behavior. Prerequisite: SOC 344. Note: Not to be taken by students with credit in SOC 402 when dealing with advanced mass communications.

**SOC 446 Social Psychology and Human Factors Research**

★3 (*fi 6*) (either term, 3-0-0). Application of social psychological theories and methods to the investigation of sociological issues in human factors research. Topics include environmental, health care, legal, and organizational analysis. Prerequisites: SOC 241 and 315.

**SOC 450 Techniques of Demographic Analysis**

★3 (*fi 6*) (either term, 3-0-0). Conventional techniques of population analysis as applied to census and vital statistics. Prerequisite: SOC 251 or consent of 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: One of SOC 251, GEOG 354, or GEOG 355.

**SOC 453 The Urban Community**

★3 (*fi 6*) (either term, 3-0-0). An examination of the urban community in Canada and other countries from the ecological, social psychological, and social organizational perspectives. Appraisal of community studies. Introduction to community research priorities and methodologies. Prerequisite: SOC 353.

**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 460 Social Organization: Organizational Theory**

★3 (*fi 6*) (either term, 3-0-0). Models of social organization; the units of social structure; the bases of social integration, social control, and social change. Prerequisite: SOC 261.

**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 464 Selected Topics in the Sociology of Work and Industry**

★3 (fi 6) (either term, 3-0-0). Topics may vary annually. Consult Department or instructor prior to registration. Prerequisite: SOC 363.

**SOC 465 Sociology of Complex Organizations**

★3 (fi 6) (either term, 3-0-0). Approaches to formal organization and management; division of labor and its organizational implications, deviance and conflict within organization, problem solving, and organizational authority. Prerequisite: SOC 261.

**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, SOC 300, or CANST 200. Not to be taken by students who have successfully completed SOC 362.

**SOC 467 Social Class in Modern Society**

★3 (fi 6) (either term, 3-0-0). Development of class structures in Western societies; recent theories and empirical findings concerning issues such as social mobility, class boundaries, class consciousness and class conflict. Prerequisite: SOC 260.

**SOC 471 Comparative Family Systems**

★3 (fi 6) (either term, 3-0-0). An examination of concepts, theories, methodologies and evidence regarding similarities and differences across a range of subcultural and cross-cultural family systems, focusing on contemporary, complex societies. Prerequisite: SOC 271 (or FAM 110 for Home Economics students only.)

**SOC 472 Selected Topics in Canadian Society**

★3 (fi 6) (either term, 3-0-0). Prerequisite: SOC 260 or 372 or ★9 of Canadian Content Courses (see §43.1.1 (I)(3)) including SOC 101.

**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 261, 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 478 Social Psychology of Family Relationships**

★3 (fi 6) (either term, 3-0-0). Current research on parent-child interaction in families of differing structures and processes. Focus is on creative, ambivalent and destructive family relationships. Resource project required on a current family issue. Prerequisites: Two of SOC 241, 271, or 374 (or FAM 110 and 320 for Home Economics students only).

**SOC 479 Selected Topics in the Family**

★3 (fi 6) (either term, 3-0-0). Topics may vary annually. Consult Department or instructor prior to registration. Prerequisite: SOC 271 (or FAM 110 for Home Economics students only).

**SOC 483 Social Psychology of Health and Illness**

★3 (fi 6) (either term, 3-0-0). Social psychological factors in health and illness and medical care, including attitudes, beliefs, roles, socialization, and interpersonal processes. Prerequisite: SOC 382.

**SOC 485 Social Epidemiology**

★3 (fi 6) (either term, 3-0-0). The social distribution and social determinants of health, illness, disability and death with a focus on sociological variables including age, gender, occupation, social class, ethnicity, religion, attitudes and lifestyles. Prerequisite: SOC 251 or 382. Note: Not to be taken by students with credit in SOC 456.

**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 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 491 Gender Studies**

★3 (fi 6) (either term, 3-0-0). Advanced study of theoretical and methodological issues in the social stratification of gender roles and statuses. Prerequisite: SOC 301.

**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 514 Evaluation Research**

★3 (fi 6) (either term, 3-0-0). Prerequisite: SOC 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 521 Seminar in Theories of Deviance**

★3 (fi 6) (first term, 0-3s-0).

**SOC 525 Seminar in Criminal Justice**

★3 (fi 6) (either term, 0-3s-0).

**SOC 526 Seminar in Criminological Theory**

★3 (fi 6) (either term, 0-3s-0).

**SOC 528 Seminar in Crime and Public Policy**

★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 532 Seminar in Theory Construction**

★3 (fi 6) (either term, 0-3s-0).

**SOC 535 Seminar in Contemporary Sociological Theory**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: SOC 333.

**SOC 537 Seminar in the Sociology of Knowledge**

★3 (fi 6) (either term, 0-3s-0).

**SOC 540 Seminar in Social Psychology**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: SOC 241.

**SOC 543 Seminar in Mass Phenomena**

★3 (fi 6) (either term, 0-3s-0).

**SOC 551 Seminar in Population Studies**

★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 556 Selected Topics in Environmental Sociology**

★3 (fi 6) (either term, 3-0-0).

**SOC 557 Sociology of Human Fertility**

★3 (fi 6) (either term, 3-0-0). Prerequisite: SOC 251. Note: Not to be taken by students with credit in SOC 451.

**SOC 558 Techniques of Demographic Analysis**

★3 (fi 6) (either term, 3-0-0). Prerequisite: SOC 251. Note: Not to be taken by students with credit in SOC 450.

**SOC 559 Seminar in Demography of Marriage and the Family**

★3 (fi 6) (either term, 0-3s-0).

**SOC 560 Seminar in Social Organization**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: SOC 261. Note: Formerly SOC 561. Not to be taken by students with credit in SOC 561.

**SOC 562 Seminar in Social Class**

★3 (fi 6) (either term, 0-3s-0).

**SOC 565 Seminar in Work**

★3 (fi 6) (either term, 0-3s-0).

**SOC 568 Seminar in Ethnic and Minority Relations**

★3 (fi 6) (either term, 0-3s-0).

**SOC 571 Seminar in Comparative Family Systems**

★3 (fi 6) (either term, 0-3s-0).

**SOC 575 Seminar in Aging and Age Differentiation**

★3 (fi 6) (either term, 0-3s-0).

**SOC 576 Seminar in Sociology of Religion**

★3 (fi 6) (either term, 0-3s-0).

**SOC 577 Seminar in Gender**

★3 (fi 6) (either term, 0-3s-0).

**SOC 580 Sociology of Development and Underdevelopment**

★3 (fi 6) (either term, 0-3s-0).

**SOC 583 Advanced Social Psychology of Health and Illness**

★3 (fi 6) (either term, 3-0-0).

**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 609 Multivariate Analysis**

★3 (fi 6) (first term, 3-0-0). Prerequisites: SOC 509 and 515 or 410 and 417 or equivalent. Note: Formerly SOC 510. Not to be taken by students with credit in SOC 511 or 510.

**SOC 616 Structural Equation Modeling with LISREL**

★3 (fi 6) (either term, 3-0-0). Prerequisite: SOC 609.

**SOC 624 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 631 Seminar in Advanced Sociological Theory**

★3 (fi 6) (either term, 0-3s-0).

**SOC 641 Selected Topics in Social Psychology**

★3 (fi 6) (either term, 0-3s-0).

**SOC 658 Advanced Techniques of Demographic Analysis**

★3 (fi 6) (either term, 3-0-0).

**SOC 670 Sociology of Gender and Family**

★3 (fi 6) (either term, 0-3s-0).

**SOC 900 Directed Research Project**

★3 (fi 6) (variable, unassigned).

## 201.204 Soil Science, SOILS

Department of Renewable Resources  
Faculty of Agriculture, Forestry, and Home Economics

**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

**SOILS 210 Introduction to Soil Science and Soil Resources**

★3 (fi 6) (first term, 3-0-3/2). 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.

**SOILS 316 Soils and People**

★3 (fi 6) (second term, 3-0-0). How people have changed world soil resources, with reference to deforestation, desertification, erosion, salinization, pollution, and global climate change. How soil resources influence human activities with examples from North America, Europe and the Tropics. Not a suitable prerequisite for other soil science courses. Prerequisite: Must have completed ★30 at the university level.

**SOILS 330 The Soil Ecosystem**

★3 (fi 6) (first term, 3-0-1.5). The study of ecological and pedological significance of several groups of organisms and their adaptation to the physical, chemical, and biological environment in soil. Students will discover the interactions between plant, microbial, and faunal interactions in soil and their qualitative and quantitative impact on biochemical processes in soil. The laboratory involves the use of a computer simulation package to quantify activity of microbial and faunal populations on various soil processes. Prerequisite: SOILS 210 or ENCS 202 or a 200-level course in biological sciences.

**SOILS 401 Research Project**

★3 (fi 6) (either term, 0-3s-0). Individual study. Study under staff supervision of a specialized topic, requiring the preparation of a comprehensive report; primarily for fourth-year students. Prerequisite: consent of the Department Chair.

**SOILS 402 Research Project**

★6 (fi 12) (two term, 0-3s-0). Individual study. Study under staff supervision of a specialized topic, requiring the preparation of a comprehensive report; primarily for fourth-year students. Prerequisite: consent of the Department Chair.

**SOILS 414 Advanced Forest Soils**

★3 (fi 6) (second term, 3-0-0). Readings and discussions on topics important to sustained productivity of forest soils; soil compaction; soil organic matter; nutrient availability; landslides and water erosion. Alterations to soil properties through forest removal and forest renewal practices. Prerequisite: FOR 314 or consent of Instructor.

**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. Prerequisite: SOILS 210 or any 200-level earth science course.

**SOILS 430 Soil Environmental Microbiology and Biochemistry**

★3 (fi 6) (second term, 3-0-3). Students discover: (1) distinguishing characteristics and environmental, industrial or biotechnological implications of specific soil microorganisms; (2) principles governing methods to study soil organisms and biochemical processes; (3) mechanisms controlling organic matter cycling and stabilization with reference to C, N, S and P; (4) microbial interactions with metals and xenobiotics; and (5) criteria for assessing influence of soil microbiology and biochemistry at the landscape level. The laboratory prepares students to study soil microorganisms and biochemical processes using the scientific method and modern techniques. Prerequisite: SOILS 210 or ENCS 202, or any 300-level course in the biological sciences.

**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. Prerequisite: SOILS 210 or ENCS 202, or completion of ★60 of university science courses.

**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.

**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 or ENCS 202.

## Graduate Courses

**Note:** The following undergraduate courses may be taken for credit by graduate students: SOILS 401, 402, 420, 430, 440, 450, 460; ENCS 475, 485; REN R 410, 425, 545.

### SOILS 501 Individual Research Project

★3 (*fi 6*) (either term, 0-3s-0). A topic of interest to the student and instructor(s) is selected for detailed study. The project may involve library research, field or laboratory work, computer studies of soil data, map work, etc. Prerequisite: consent of the Department Chair.

### SOILS 502 Individual Research Project

★6 (*fi 12*) (two term, 0-3s-0). A topic of interest to the student and instructor(s) is selected for detailed study. The project may involve library research, field or laboratory work, computer studies of soil data, map work, etc. Prerequisite: consent of the Department Chair.

### SOILS 515 Clay Mineralogy

★3 (*fi 6*) (second term, 3-0-3). Structure and composition of clay minerals. Properties of clay minerals and methods of identification with emphasis on x-ray diffraction techniques. Nature and properties of other secondary soil minerals. Prerequisites: Three undergraduate level courses in the geological, engineering, or soil sciences.

### SOILS 520 Advanced Soil Classification

★3 (*fi 6*) (second term, 3-0-3). Systematics of soil classification throughout the world with special emphasis on pedogenesis, classification, distribution and use of soils outside of Canada. Laboratory consists of a minimum 10-day field trip normally scheduled immediately following the final examination period and conducted regionally in North America. Costs of lodging, meals, and transportation to be borne by students. Offered in alternate years. Prerequisite: SOILS 420.

### SOILS 530 Advanced Soil Ecology

★3 (*fi 6*) (second term, 3-0-3). Ecological approach to studying plant, microbial and faunal interactions in soil. Assessment and integration of the qualitative and quantitative impact of soil microorganisms, fauna and plants on decomposition, element cycling and soil structure dynamics in terrestrial ecosystems. The acquired information will be linked to current global environmental issues. Students develop simulation models and practise writing grant applications. Offered in alternate years. Prerequisite: SOILS 330, 430 or a 300-level course in biological sciences.

### SOILS 535 Advanced Soil Biochemistry

★3 (*fi 6*) (first term, 1-2s-3). Lecture and seminar course on special topics from the recent literature in soil biochemistry; intensive literature review and laboratory project on some aspect of the topics discussed. Offered in alternate years. Prerequisite: SOILS 430.

### SOILS 540 Advanced Soil Physics

★3 (*fi 6*) (second term, 3-0-3). Physical principles of water, solutes, and heat transport in the soil-plant-atmosphere continuum; formulation and solution of mathematical equations describing the dynamic interactions among water, solutes, heat, soil matrix and plants; application of physical theories at the field scale, including effects of the soil spatial variability and preferential flow. Offered in alternate years. Prerequisites: A course in calculus and a course in one of the following: soil physics, soil mechanics, hydrogeology, physics or thermodynamics.

### SOILS 550 Advanced Soil Chemistry

★3 (*fi 6*) (second term, 3-2s-0). Principles of thermodynamics and complex chemical reactions as applied to soil systems. Topics will include electrical double layer theory thermodynamics of soil water (total and component potentials); soil solutes (Electropotentiometric measurements, chemical equilibria, solubility, activity ratio diagrams, complex formation, speciation using computer modelling); ion exchange/adsorption; (isotherms, selectivity, solid phase activity coefficients, exchange equilibria constants, specific adsorption, molecular models). Offered in alternate years. Prerequisite: consent of Instructor.

### SOILS 900 Research Project

★3 (*fi 6*) (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.

## 201.205 Spanish, SPAN

Department of Modern Languages and Cultural Studies:  
Germanic, Romance, Slavic  
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, or they may be encouraged to seek "Credit by Special Assessment" (see \$44.5) where 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 course, credit may be withheld.

## Undergraduate Courses

### SPAN 100 Beginners' Spanish

★6 (*fi 12*) (two term, 5-0-0). A basic course, intended for students with no previous knowledge of the language, emphasizing spoken and written Spanish. Note: Not open to students with matriculation in Spanish, i.e. Spanish 35. Normally students will proceed from SPAN 100 to SPAN 200.

### SPAN 200 Intermediate Spanish I

★3 (*fi 6*) (first term, 3-0-0). A course intended to consolidate a basic understanding of Spanish through a systematic grammar review and practice in the various language skills. Prerequisite: SPAN 100 or consent of Department.

### SPAN 201 Intermediate Spanish II

★3 (*fi 6*) (second term, 3-0-0). A continuation of Spanish 200. Prerequisite: SPAN 200 or consent of Department. Note: Not to be taken by students with credit in SPAN 215 or 216.

### SPAN 205 Studies in Spanish Language

★3 (*fi 6*) (either term, 3-0-0). Designed to complement SPAN 200 and 201 and to prepare students for further study in Spanish. Prerequisite: SPAN 100 or consent of Department.

### SPAN 300 Conversation and Composition in Spanish

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: SPAN 200 and 201, or consent of Department. Note: Not to be taken by students with credit in SPAN 215 or 216.

### SPAN 301 Spanish in Context

★3 (*fi 6*) (either term, 3-0-0). An introduction to the different uses of Spanish. Through audio-visual materials and different kinds of written texts, students will be introduced to the cultural forms of Spain and Latin America. This course is intended as preparation for further study of the cultural dimensions of Spanish. Prerequisite: SPAN 200 and 201, or consent of Department. Note: Not to be taken by students with credit in SPAN 220.

### SPAN 307 Civilization and Culture in Spain Before 1900

★3 (*fi 6*) (either term, 3-0-0). Aspects of Spanish civilization and culture in the Iberian Peninsula from the Middle Ages to the end of the 19th century. Designed to complement the study of Spanish and to provide an introduction to the major trends in thought and cultural forms in Spain. Prerequisite: ★6 in Spanish at the 200 level or consent of Department.

### SPAN 308 Civilization and Culture in Spanish America Before 1900

★3 (*fi 6*) (either term, 3-0-0). Aspects of civilization and culture in Spanish America to the end of the 19th century. Designed to complement the study of Spanish and to provide an introduction to the major trends in thought and cultural forms in Spanish America. Prerequisite: ★6 in Spanish at the 200 level or consent of Department.

### SPAN 309 Civilization and Culture in Spain Since 1900

★3 (*fi 6*) (either term, 3-0-0). Civilization and culture in Spain since the beginning of the 20th century. Designed to complement the study of Spanish and to provide an introduction to the major trends in thought and cultural forms, with particular emphasis on the contemporary period. Prerequisite: ★6 in Spanish at the 200 level or consent of Department.

### SPAN 310 Civilization and Culture in Spanish America Since 1900

★3 (*fi 6*) (either term, 3-0-0). Civilization and culture in Spanish America since the beginning of the 20th century. Designed to complement the study of Spanish and to provide an introduction to the major trends in thought and cultural forms in Spanish America, with particular emphasis on the contemporary period. Prerequisite: ★6 in Spanish at the 200 level or consent of Department.

### SPAN 360 Literature in Spanish in English Translation

★3 (*fi 6*) (either term, 3-0-0). Study of selected works of literature from Spain and/or Spanish America. Note: This course will not fulfil the Language other than English requirement of the BA degree.

### SPAN 370 Spanish Linguistics I

★3 (*fi 6*) (either term, 3-0-0). Possible topics to include Spanish phonetics, phonology, morphology, dialectology, etc. Special emphasis on how these issues are relevant to applied linguistics. Prerequisite: SPAN 201 or consent of Department.

### SPAN 371 Spanish Linguistics II

★3 (*fi 6*) (either term, 3-0-0). Possible topics to include Spanish syntax, semantics,

lexical semantics, sociolinguistics, etc. Special emphasis on how these issues are relevant to applied linguistics. Prerequisite: SPAN 201 or consent of Department.

**SPAN 405 Exercises in Translation: Spanish into English**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: SPAN 300 or 301 or consent of Department.

**SPAN 406 Exercises in Translation: English into Spanish**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: SPAN 300 or 301 or consent of Department.

**SPAN 407 Advanced Grammar and Composition**

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: SPAN 300 or 301 or consent of Department.

**SPAN 409 Topics in Spanish Language**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: SPAN 300 or 301 or consent of Department.

**SPAN 412 Topics in Hispanic Culture**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: SPAN 307, 308, 309, or 310.

**SPAN 431 Business Spanish**

★3 (*fi 6*) (either term, 3-0-0). Emphasis on the development of the relevant vocabulary, and the ability to participate in the appropriate discourses, both spoken and written. Prerequisite: ★3 Spanish at the 300-level or consent of Department.

**SPAN 440 Topics in Spanish Peninsular Literature**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: SPAN 307, 308, 309, or 310.

**SPAN 450 Topics in Spanish-American Literature**

★3 (*fi 6*) (either term, 3-0-0). Prerequisite: SPAN 307, 308, 309, or 310.

**SPAN 475 Spanish Applied Linguistics I**

★3 (*fi 6*) (either term, 3-0-0). Issues relating to the acquisition of Spanish as a second language. Topics to include areas of particular difficulty in syntax, morphology, semantics, and phonology for learners of Spanish. Prerequisite: ★3 in Spanish at the 300-level or consent of Department.

**SPAN 476 Spanish Applied Linguistics II**

★3 (*fi 6*) (either term, 3-0-0). Issues relating to the cultural environments where Spanish is spoken as a native language and as a second language, bilingualism, and educational and language policy in the Spanish-speaking world. Prerequisite: ★3 in Spanish at the 300-level or consent of Department.

**SPAN 499 Directed Reading**

★3-6 (*variable*) (variable, 3-0-0). A course designed to meet the needs of individual students in relation to some topic of study not covered in the other available courses at the same level. Prerequisite: consent of Department.

**SPAN 520 Honors Thesis**

★3 (*fi 6*) (variable, variable). This course is for students in the final year of an honors program in Spanish and Latin American studies. Prerequisite: consent of Department.

## Graduate Courses

**SPAN 500 Reading Course**

★3-6 (*variable*) (two term, 3-0-0). This course is for graduate students who wish to satisfy the language requirement of their Department. Note: Not open to undergraduates.

**SPAN 525 Approaches to Literary Criticism**

★3-6 (*variable*) (variable, 3-0-0). Prerequisite: consent of Department.

**SPAN 535 Topics in Hispanic Culture**

★3-6 (*variable*) (variable, 3-0-0).

**SPAN 545 Topics in the History of the Hispanic Literatures**

★3-6 (*variable*) (variable, 3-0-0).

**SPAN 555 Teaching Strategies for Postsecondary Language Instructors of Spanish**

★3 (*fi 6*) (first term, 3-0-0). Designed to help graduate teaching assistants develop expertise in the instruction of Spanish at the college and university levels.

**SPAN 565 Topics in the Forms and Genres of Hispanic Literature**

★3-6 (*variable*) (variable, 3-0-0).

**SPAN 575 Spanish Applied Linguistics I**

★3 (*fi 6*) (either term, 3-0-0). Issues relating to the acquisition of Spanish as a second language. Topics to include areas of particular difficulty in syntax, morphology, semantics, and phonology for learners of Spanish.

**SPAN 576 Spanish Applied Linguistics II**

★3 (*fi 6*) (either term, 3-0-0). Issues relating to the cultural environments where Spanish is spoken as a native language and as a second language, bilingualism, and educational and language policy in the Spanish-speaking world.

**SPAN 599 Directed Reading**

★3-6 (*variable*) (variable, 3-0-0). Study of a topic not dealt with in other Honors

or Graduate courses. Designed to meet the needs of individual students. Prerequisite: consent of Department.

**SPAN 635 Seminar in Hispanic Culture**

★3-6 (*variable*) (variable, 0-3s-0). Not open to students with credit in SPAN 690 or to MA students.

**SPAN 662 Seminar in Prose Fiction in Spanish**

★3-6 (*variable*) (variable, 0-3s-0).

**SPAN 664 Seminar in Theatre in Spanish**

★3-6 (*variable*) (variable, 0-3s-0).

**SPAN 691 Seminar in Hispanic Literatures**

★3-6 (*variable*) (variable, 0-3s-0).

**SPAN 699 Conference Course**

★3-6 (*variable*) (variable, 3-0-0).

**SPAN 900 Directed Research Project**

★6 (*fi 12*) (variable, variable).

## 201.206 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 500 Introduction to Graduate Research**

★3 (*fi 6*) (first term, 3-0-0). Investigation of research strategies in speech pathology and audiology, analyses of completed and proposed research, initial thesis planning. Normally taken during student's first term. (MSc)

**SPA 501 Clinical Research Methods**

★3 (*fi 6*) (first 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 MSLP-B students only.)

**SPA 502 Anatomy and Physiology of the Speech Mechanism**

★3 (*fi 6*) (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, resonance, and articulation in speech production. 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 projected materials. (Restricted to MSLP-B students only.)

**SPA 504 Hearing Science**

★1.5 (*fi 3*) (either term, 1.5-0-1). Study of the anatomy and physiology of the auditory and vestibular systems and the principles and measurement of sound, including psychophysical methods and psychoacoustics. Prerequisite or corequisite: SPA 502 or equivalent. (Restricted to MSLP-B students only.)

**SPA 505 Speech Science**

★1.5 (*fi 3*) (either term, 1.5-0-1). Study of speech perception, acoustical theories of vowel and consonant production, and the aeromechanical principles of speech production. Laboratories provide interactive demonstrations of instrumentation for recording and measuring acoustic and aeromechanical aspects of speech production. Prerequisite or corequisite: SPA 502 or equivalent, SPA 504, SPA 507. (Restricted to MSLP-B 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 MSLP-B students only.)

**SPA 509 Motor Speech Disorders**

★3 (*fi 6*) (either term, 3-0-2). 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 MSLP-B students only.)

**SPA 511 Child Language Development and Assessment**

★3 (*fi 6*) (first term, 3-0-2). 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 MSLP-B students only.)

**SPA 514 Diagnostic Audiology**

★3 (*fi 6*) (either term, 3-0-0.5). Study of assessment procedures and instrumentation used in diagnostic audiology. Emphasis is on calibration, evaluation, and test result interpretation. Laboratory experience in test administration is provided. Prerequisites or corequisites: SPA 502 and 504 or equivalent. (Restricted to MSLP-B 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 MSLP-B students only.)

**SPA 518 Remediation of Child Language Disorders**

★3 (*fi 6*) (second term, 3-0-2). 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 MSLP-B students only.)

**SPA 520 Adult Language Disorders**

★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 MSLP-B students only.)

**SPA 521 Dysphagia**

★1.5 (*fi 3*) (Spring/Summer, 0-2L-0). This course will provide an overview of the anatomical and neurophysiological bases of normal and abnormal feeding and swallowing in adults and children. Structural and neurological conditions commonly associated with dysphagia will be reviewed. A framework of interdisciplinary assessment and management of dysphagia will be provided. Prerequisite: SPA 502 or equivalent. (Restricted to MSLP-B students.)

**SPA 523 Augmentative/Alternative Communication Systems**

★1.5 (*fi 3*) (first 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 MSLP-B 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 MSLP (B) courses including SPA 507, 511, 518. Corequisite: SPA 516. (Restricted to MSLP-B students only.)

**SPA 525 Introduction to Clinical Practicum II**

★2 (*fi 4*) (first 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. 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 issues as they arise. Prerequisite: SPA 524. (Restricted to MSLP-B students only.)

**SPA 526 Voice and Resonance Disorders**

★4 (*fi 8*) (either term, 4-0-2). A study of the causes, nature, clinical assessment, and management of voice and resonance disorders. Prerequisites: SPA 502 and SPA 505. (Restricted to MSLP-B students only.)

**SPA 527 Language and Literacy**

★3 (*fi 6*) (either term, 3-0-1). 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 SPA 518. (Restricted to MSLP-B 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 MSLP-B students only.)

**SPA 531 Geriatric Communication Disorders**

★3 (*fi 6*) (either term, 3-0-1). Study of the nature and clinical management of speech, hearing, and language problems associated with the physiological, psychological, and sociological aspects of aging. Prerequisites: SPA 502, 509, 514, 520 and 521. (Restricted to MSLP-B 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 MSLP(B) academic courses. (Restricted to MSLP-B 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 MSLP(B) academic courses. (Restricted to MSLP-B students only.)

**SPA 534 Aural (Re)habilitation**

★3 (*fi 6*) (either term, 3-0-0). Study of the diagnostic and treatment strategies for communication problems associated with childhood and adult onset hearing loss. Prerequisite: SPA 514. (Restricted to MSLP-B 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 MSLP-B 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 MSLP-B students only.)

**SPA 542 Counselling in Speech-Language Pathology**

★3 (*fi 6*) (Spring/Summer, 3-0-0). A study of counselling issues, principles, and strategies applied to clinical processes in speech-language pathology. (MSLP-A) Offered in Spring/Summer only.

**SPA 544 Clinical Supervision in Speech-Language Pathology**

★3 (*fi 6*) (Spring/Summer, 3-0-0). A study of clinical supervision models for students, support personnel, and professionals. (MSLP-A)

**SPA 545 Audiology for Educators of the Hearing Impaired**

★3 (*fi 6*) (first term, 3-0-2). An introduction to audiology including anatomy and physiology of the auditory system, acoustics of speech, basic audiometric tests, amplification systems and habitative procedures used by the classroom teacher. The course is restricted to students enrolled in the Faculty of Education Program for training Teachers of the Hearing Impaired. Prerequisite: consent of Department.

**SPA 546 Dysphagia**

★3 (*fi 6*) (Spring/Summer, 3-0-0). A study of assessment and management of feeding and swallowing disorders in children and adults. (MSLP-A) Offered in Spring/Summer only.

**SPA 548 Motor Speech Disorders in Children**

★3 (*fi 6*) (Spring/Summer, 3-0-0). A study of recent advances in assessment and treatment of motor speech disorders in paediatric populations. (MSLP-A) Offered in Spring/Summer only.

**SPA 549 Phonological Disorders in Children**

★3 (*fi 6*) (Spring/Summer, 3-0-0). Advanced study of recent developments in assessment and treatment approaches for children with phonological/articulatory disorders. (MSLP-A) Offered in Spring/Summer only.

**SPA 550 Child Language Disorders**

★3 (*fi 39*) (Spring/Summer, 3-0-0). Advanced study of assessment and remediation of language disorders in children. (MSLP-A) Offered in Spring/Summer only.

**SPA 551 Literacy and Language-Disordered Children**

★3 (*fi 6*) (Spring/Summer, 3-0-0). A consideration of language-learning disabled children relative to the relationships between oral and written language and their assessment and treatment. (MSLP-A) Offered in Spring/Summer only.

**SPA 552 Traumatic Brain Injury**

★3 (*fi 6*) (Spring/Summer, 3-0-0). A study of the nature of traumatic brain injury in children and adults and approaches to assessment and remediation of consequent communication disorders. (MSLP-A) Offered in Spring/Summer only.

**SPA 553 Acquired Language Disorders in Adults**

★3 (*fi 6*) (Spring/Summer, 3-0-0). Advanced study of recent developments in assessment and remediation of acquired and age-related language disorders in adult populations. (MSLP-A) Offered in Spring/Summer only.

**SPA 554 Augmentative and Alternative Communication**

★3 (*fi 6*) (Spring/Summer, 3-0-0). A study of augmentative and alternative communication technology and strategies relevant to management of non-speaking children and adults. (MSLP-A) Offered in Spring/Summer only.

**SPA 556 Fluency Disorders**

★3 (*fi 6*) (Spring/Summer, 3-0-0). A study of recent developments relevant to assessment and remediation of stuttering in children and adults. (MSLP-A) Offered in Spring/Summer only.

**SPA 557 Instrumental Measurement of Disordered Speech Production**

★3 (*fi 6*) (Spring/Summer, 0-3L-0). Application of recent technology to assessment and management of disorders of respiration, voice, resonance, and articulation. (MSLP-A) Offered in Spring/Summer only.

**SPA 558 Assessment and Outcome Measurement in Speech-Language Pathology**

★3 (*fi 6*) (Spring/Summer, 3-0-0). A study of outcome measurement strategies and evaluation processes applicable in determining treatment efficacy and accountability. (MSLP-A) Offered in Spring/Summer only.

**SPA 559 Instrumental Measurement and Analysis**

★4 (*fi 8*) (either term, 3-0-3). Advanced study of laboratory methods in speech acoustics and physiology. Prerequisite: SPA 503 or consent of Department. Formerly SPA 506. (MSc)

**SPA 561 Methods of Data Analysis**

★3 (*fi 6*) (either term, 0-3s-0). The role of statistics in speech pathology and audiology research, including study of basic concepts related to selection of analysis methods for particular data sets and interpretation of results. Prerequisites: Introductory statistics course and consent of Department. Formerly SPA 502. (MSc)

**SPA 565 Supervision of Speech-Language Pathology**

★3 (*fi 6*) (either term, 0-3s-0). An introduction to the supervisory process as a quantifiable, goal-oriented component of the clinical process: including relevant information from the literature in speech-language pathology, education and counselling. Prerequisite: consent of Department. Formerly SPA 508. (MSc)

**SPA 567 Aging and Communication**

★3 (*fi 6*) (either term, 0-3s-0). Advanced interdisciplinary study of the research literature on physiological, psychological and sociological aspects of aging and their impact on speech, hearing, and language. Topical focus may vary. Prerequisite: consent of Department. Formerly SPA 513. (MSc)

**SPA 571 Issues on Phonology and Phonological Disorders**

★3 (*fi 6*) (Spring/Summer, 0-3s-0). Advanced study of current literature on phonological development and disorders. Topical focus may vary. Prerequisite: consent of Department. Formerly SPA 523. (MSc)

**SPA 573 Issues in Child Language**

★3 (*fi 6*) (either term, 0-3s-0). Advanced study of selected topics in normal language acquisition. Topical focus may vary. Prerequisite: consent of Department. Formerly SPA 523. (MSc)

**SPA 575 Language Disorders: Children**

★3 (*fi 6*) (either term, 0-3s-0). Advanced study of current literature on specific topic areas in the evaluation and management of children with acquired language disorders. Topical focus may vary. Prerequisite: consent of Department. Formerly SPA 525. (MSc)

**SPA 577 Language Disorders: Adults**

★3 (*fi 6*) (either term, 0-3s-0). Advanced study of research literature on acquired aphasia and related language disorders. Topical focus may vary. Prerequisite: consent of Department. (MSc)

**SPA 579 Dyspraxia and Dysarthria**

★3 (*fi 6*) (either term, 0-3s-0). Advanced study of the research literature on congenital and acquired disorders of motor speech programming and execution. Topical focus may vary. Prerequisite: SPA 509 or consent of Department. Formerly SPA 531. (MSc)

**SPA 581 Craniofacial Anomalies**

★3 (*fi 6*) (either term, 0-3s-0). Advanced study of recent research on the evaluation and management of communication disorders associated with craniofacial

anomalies. Prerequisite or corequisite: SPA 559 or consent of Department. Formerly SPA 533. (MSc)

**SPA 583 Disorders of Phonation**

★3 (*fi 6*) (either term, 0-3s-0). Advanced study of current evaluation and management techniques for disorders of phonation and resonance. Prerequisite or corequisite: SPA 559 or consent of Department. Formerly SPA 535. (MSc)

**SPA 591 Special Topics**

★3 (*fi 6*) (either term, 0-3s-0). Special seminars. Content will vary from year to year. Topics will be announced prior to registration period. The student's transcript will carry a title descriptive of the content. May be repeated. Prerequisite: consent of Department. Formerly SPA 570. (MSc)

**SPA 597 Advanced Clinical Practicum**

★4.5 (*fi 9*) (either term, 0-12c-0). May be repeated. 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. Prerequisite: SPA 525 and all MSLP(B) academic courses. (Restricted to MSLP-B students only.)

**SPA 598 Directed Individual Reading and Research**

★1-12 (*variable*) (either term, variable). May be repeated. Prerequisite: consent of Department. (MSc/MSLP)

**SPA 900 Directed Research Project**

★3 (*fi 6*) (either term, 0-3s-0). Projects are normally of a clinical research nature. This is in keeping with the philosophy that clinical speech-language pathologists should be able to demonstrate scientifically the impacts of their intervention programs, both for accountability and for contributing to the knowledge base regarding effective clinical treatment. Prerequisite: SPA 501. (Restricted to MSLP-B students only.)

## 201.207 Statistics and Applied Probability, STAT

Department of Mathematical Sciences  
Faculty of Science

**Note:** Statistical software packages will normally be used in courses that contain data analysis.

### Undergraduate Courses

**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 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.

**STAT 151 Introduction to Applied Statistics I**

★3 (*fi 6*) (either term, 3-0-2). 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. 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. Pascal is used in laboratory periods. This course is restricted to Honors and Specialization students in Computing Science. Prerequisites: MATH 115 or equivalent; MATH 120 or 125 or equivalent. Corequisite: MATH 214 or 217. 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 not be obtained for both STAT 222 and 266.

**STAT 235 Introductory Statistics for Engineering**

★3 (*fi 6*) (either term, 3-0-2). 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, 255, 266; PSYCO 211 or SOC 210.

#### **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, or 341. Prerequisite: STAT 141 or 151 or equivalent.

#### **STAT 255 Introductory Statistics for Economics**

★6 (*fi 12*) (two term, 3-0-3). Frequency distributions and graphs. Sample statistics. Basic probability. Probability distributions and the expectation operator. Sampling. Significance tests and sampling distributions. Contingency tables. Regression and correlation. Analysis of variance. Time series. Index numbers. Nonparametric inference. Prerequisite or corequisite: MATH 113. 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 265 Elements of Probability Theory**

★3 (*fi 6*) (either term, 3-0-0). Probability spaces; random variables, random vectors and probability distributions. Expectation, moments and conditional probability. Prerequisite: MATH 115 or equivalent. Corequisite: MATH 214. Credit may not be obtained for both STAT 265 and STAT 221.

#### **STAT 266 Elements of Statistical Inference**

★3 (*fi 6*) (either term, 3-0-0). Principles of parametric and nonparametric inference; hypothesis testing; one-, two- and multisample problems; confidence intervals. Prerequisite: STAT 265. Note: Credit may not be obtained for both STAT 222 and 266.

#### **STAT 312 Mathematical Methods in Statistics**

★3 (*fi 6*) (either term, 3-0-0). Theory and applications of basic mathematical results required in Statistics. Applications of diagonalization results for real symmetric matrices, of continuity, differentiation. Riemann-Stieljes integration and multivariable calculus to the theory of Statistics including least square estimation, generating functions, distribution theory. Prerequisites: MATH 120 or 125 or equivalent; MATH 214 or MATH 217 or equivalent.

#### **STAT 332 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. This course may be offered in alternate years.

#### **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.

#### **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. Prerequisites: STAT 265 and one other Statistics course.

#### **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: A course in Linear Algebra and STAT 265 or equivalent and one other statistics course.

#### **STAT 377 Non-Parametric Inference**

★3 (*fi 6*) (either term, 3-0-0). Tests for randomness, goodness of fit, tests for location and scale, non-parametric estimators. Robust statistics. Introduction to computer packages for non-parametric statistics. Note: This course may be offered only in alternate years. Prerequisites: STAT 265 and one other statistics course.

#### **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: A course in Linear Algebra and STAT 265 or equivalent and one other statistics course.

#### **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 1 to 9 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: WKEX 953.

#### **STAT 453 Risk Theory**

★3 (*fi 6*) (either term, 3-0-0). Economics of insurance, risk models, independent increment process, Markov processes, premium calculation, retentions and reserves, stability, dividend policy, utility, applications or risk theory. Prerequisites: STAT 312 and MATH 354.

#### **STAT 454 Topics in Actuarial Science**

★3 (*fi 6*) (second term, 3-0-0). Current topics in Mathematics and Statistics for Actuarial Science. Prerequisites: consent of Instructor and any 300- or 400 level STAT course.

#### **STAT 466 Statistical Inference**

★3 (*fi 6*) (second term, 3-0-0). Foundations of statistical inference. Point estimation, properties of estimates. Multivariate normal distribution. Testing statistical hypotheses, likelihood ratio test, Chi-square  $t$ - and  $F$ -test. Confidence intervals. Prerequisites: STAT 266 and one of STAT 312, 471.

#### **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. Prerequisites: STAT 265 and STAT 312, MATH 214, 215, and a 300-level Statistics or Mathematics course.

#### **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. Prerequisites: STAT 266 and STAT 312 or consent of the Department.

## Graduate Courses

#### **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. This course is taught concurrently with STAT 312; those students taking it for graduate credit will be required to submit a project on a topic chosen in consultation with the instructor, in addition to fulfilling the requirements of STAT 312. Prerequisite: consent of Department.

#### **STAT 558 Techniques of Statistical Analysis I**

★3 (*fi 6*) (first term, 3-0-0). The contents will be selected each year from applied topics. Prerequisite: consent of Department.

#### **STAT 559 Techniques of Statistical Analysis II**

★3 (*fi 6*) (second term, 3-0-0). The contents will be selected each year from applied topics. Prerequisite: consent of Department.

#### **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, 466, 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 466.

#### **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 378. Corequisites: STAT 466, 471.

#### **STAT 571 Applied Measure Theory for Probability**

★3 (*fi 6*) (either term, 3-0-0). Fundamentals of measure and integration required for the study of Probability. Applications to Probability including convergence of

measures, conditional probability and expectation. Prerequisites: STAT 471, or STAT 512 or their equivalents.

**STAT 575 Multivariate Analysis**

★3 (fi 6) (either term, 3-0-2). The multivariate normal distribution, multivariate regression and analysis of variance, classification, canonical correlation, principal components, factor analysis. Prerequisite: consent of Department. STAT 575 may not be taken for credit if credit has already been obtained in STAT 475.

**STAT 577 Nonparametric Inference**

★3 (fi 6) (either term, 3-0-0). Tests for randomness. Rank tests and estimates of location: one-sample and two-sample location model. Nonparametric analysis of variance: one-way and two-way layouts. Nonparametric tests in linear regression. Multivariate location model. Prerequisite: STAT 378. Corequisites: STAT 466, 471.

**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.

**STAT 666 Theory of Point Estimation**

★3 (fi 6) (either term, 3-0-0). Concept of decision theory. Exponential families of distributions. Unbiased, equivariant, Bayes and minimax estimation. Large sample theory, asymptotic optimality. Prerequisites: STAT 466, 471, 472.

**STAT 667 Theory of Hypothesis Tests and Confidence Regions**

★3 (fi 6) (second term, 3-0-0). Optimality criteria, unbiasedness, invariance. Prerequisites: STAT 466, 472.

**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 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 571 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 466 or equivalent.

**STAT 766 Topics in Statistics I**

★3 (fi 6) (first term, 3-0-0).

**STAT 767 Topics in Statistics II**

★3 (fi 6) (second term, 3-0-0).

**STAT 771 Topics in Probability I**

★3 (fi 6) (first term, 3-0-0).

**STAT 772 Topics in Probability II**

★3 (fi 6) (second term, 3-0-0).

**STAT 900 Directed Research Project**

★3 (fi 6) (variable, unassigned). Open only to students taking the MSc non-thesis option in statistics.

## 201.208 Statistique, STATQ

Faculté Saint-Jean

### Cours de 1er cycle

**STATQ 141 Introduction à la statistique**

★3 (fi 6) (l'un ou l'autre semestre, 3-0-0). Variables aléatoires et distribution des fréquences. Distribution des échantillons et inférence élémentaire. Tables des éventualités (contingences) et test d'indépendance. Régression et corrélation. Analyse de la variance. Prérequis: Mathématiques 30 ou équivalent. Ce cours n'est pas accessible aux étudiants ayant ou postulant des crédits pour STAT 151, 155, 221, 235, 236, 237, 255, 265, PSYCO 211, SCSOC 322, ou SOC 210.

## 201.209 Surgery, SURG

Department of Surgery  
Faculty of Medicine and Dentistry

### Undergraduate Courses

**SURG 431 Topics in Otolaryngology**

★1 (fi 2) (two term, 16 hours). For third year Medical students only.

**SURG 446 Student Internship**

★7.5 (fi 15) (two term, 10 weeks). Student internship for students in Phase III, MD program only.

### Graduate Courses

**SURG 500 Experimental Surgery**

★3 (fi 6) (second term, 0-0-3). Designed to introduce MSc and PhD candidates to basic experimental surgical procedures. Course will include: (a) surgical anatomy of laboratory animals, (b) basic surgical methods, (c) selected methods in experimental surgery. Prerequisite: consent of Department.

**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) (two term, 40 hours). The course will review the fundamentals of microvascular surgery, and then allow 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 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.

### Courses Beginning in 2000-2001

**SURG 546 Surgery Student Internship**

★10 (fi 20) (either term, 10 weeks). Student internship in Surgery for students registered in the MD program.

## 201.210 Swedish, SWED

Department of Modern Languages and Cultural Studies:  
Germanic, Romance, Slavic  
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, or they may be encouraged to seek "Credit by Special Assessment" (see §44.5) where 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 course, credit may be withheld.
- (4) See also Scandinavian (SCAND) listings.

## Undergraduate Courses

### **01 SWED 100 Elementary Swedish**

★6 (fi 12) (two term, 3-0-2). Designed to give basic practical skill in everyday spoken and written Swedish. The oral approach, using the laboratory, is followed. Formerly SCAND 101.

### **01 SWED 200 Second-Year Swedish**

★6 (fi 12) (two term, 3-0-1). Reading and study of selected texts in Swedish literature and culture. Composition and conversation. Prerequisite: SWED 100 or consent of Department. Formerly SCAND 301.

## 201.211 Textiles, Clothing, and Culture, TCC

Department of Human Ecology  
Faculty of Agriculture, Forestry, and Home Economics

**Note:** See also Consumer Studies (CONS), Family Studies (FAM), and Human Ecology (HECOL) listings for related courses

## Undergraduate Courses

### **01 TCC 150 Design Processes for the Near Environment**

★3 (fi 6) (either term, 3-0-3). An introductory design course aimed at developing visual awareness and an understanding of design processes. Functional components of the near environment and their aesthetic qualities are evaluated through creative problem solving.

### **01 TCC 252 Textile Design I**

★3 (fi 6) (either term, 2-0-4). An introductory studio course in various methods of printing and dyeing textiles. Prerequisites: TCC 150 and either ART H 102 or 374 or consent of Instructor.

### **01 TCC 254 Apparel Design and Technology I**

★3 (fi 6) (either term, 3-0-3). Principles of design integrated into pattern-drafting methods. A creative problem-solving approach to apparel design. Production analysis, profitability and industrial techniques introduced. Prerequisite: Clothing and Textiles 20 or three intermediate-level CTS (Fashion Studies) modules, or equivalent; TCC 150 or consent of Instructor.

### **01 TCC 260 Dress and Culture**

★3 (fi 6) (either term, 3-0-0). This course examines clothing as a primary historical, social, and cultural document that reveals its message through time and across cultures. Course themes include the construction of gender, the economics and politics of appearance, the body as a material of fashion, the way clothing depicts narrative in film, and a critical evaluation of fashion theory in the global context. Prerequisite: HECOL 238 or consent of Instructor.

### **01 TCC 266 The Apparel Industry**

★3 (fi 6) (either term, 3-0-0). Exploration of the apparel industry, both nationally and globally. Emphasis on current issues impacting on the apparel industry and competitiveness. Entrepreneurship opportunities explored. Link to local industry through guest speakers and industry involvement. Offered in alternate years.

### **01 TCC 268 Survey of Historic Dress**

★3 (fi 6) (either term, 3-0-0). Introduction to the historical development of dress within a European/North American context, including concepts, factors, and features of fashion change. Contemporary applications in museums, performance, design, and merchandising will be considered. Resources will include the Clothing and Textiles Collection.

### **01 TCC 270 Textiles for the Consumer**

★3 (fi 6) (either term, 3-0-3). Study of textile components (fibre, yarn, fibre coloration and fabric finish) and their relationship to performance.

### **TCC 350 Computer-aided Textile and Apparel Design**

★3 (fi 6) (either term, 3-0-3). Application of computer-aided design technology to textile and apparel design. Focus on CAD for textile or apparel business and entrepreneurship. Prerequisites: TCC 254 and TCC 252. Offered in alternate years starting in 1999/2000.

### **01 TCC 352 Textile Design II**

★3 (fi 6) (either term, 2-0-4). An advanced studio course in various methods of printing and dyeing textiles with a major component of independent study. Textiles from various cultures will be studied. Prerequisites: TCC 252 and consent of Instructor.

### **01 TCC 369 Historic and Cross Cultural Textiles**

★3 (fi 6) (either term, 3-0-3). Textiles from a variety of cultures and time periods; their social significance, production, structure design, and the influence on contemporary design. The role of gender in different cultural systems is examined through myth and legend, and division of production and marketing labor. Prerequisites: ★9 in History, Art History, Anthropology, HECOL 238, or Women's Studies, or consent of Instructor.

### **01 TCC 371 Textile and Apparel Performance Evaluation**

★3 (fi 6) (either term, 3-0-3). Relationship of performance to end use. Physical testing and evaluation focusing on consumer products. Textile standards and specifications. Prerequisite: TCC 270. Offered in alternate years.

### **TCC 438 Domestic Material Culture**

★3 (fi 6) (either term, 3-0-3). Investigation of the material culture of domestic environments, including homes, furnishings, and textiles. Focus will be on late 19th and 20th centuries in Western Canada, while drawing on precedents from a variety of time periods and cultures. Students will be involved in primary research using departmental collections, museums, historic sites, archives as well as oral history of individuals, families, and communities. Prerequisite: HECOL 238 or consent of Instructor. Offered in alternate years.

### **TCC 450 Design Processes for the Near Environment**

★3 (fi 6) (either term, 3-0-3). Design at the senior level; development of visual awareness and understanding of design processes. Prerequisites: Graduate standing and permission of instructor. Note: May not be taken for credit by students with credit in TCC 150 or 151.

### **TCC 452 Selected Topics in Textiles**

★3 (fi 6) (Spring/Summer, 3-0-3). Normally offered in Spring/Summer.

### **TCC 454 Apparel Design and Technology II**

★3 (fi 6) (either term, 3-0-3). Advanced problems in pattern drafting and apparel design. Development of a production pattern and a line of clothing. Exploration of the functional design process through research into activities, special needs, and appropriate textiles. Interrelationship of design, construction and textiles. Prerequisite: TCC 254. Offered in alternate years.

### **TCC 456 Selected Topics in Apparel**

★3 (fi 6) (Spring/Summer, 3-0-3). Normally offered in Spring/Summer.

### **TCC 457 Apparel Design and Technology**

★3 (fi 6) (either term, 3-0-3). The principles of design integrated into pattern-drafting methods. Exploration of the functional design process through research into activities, special needs, and appropriate textiles. Prerequisites: Graduate standing and permission of Instructor. May not be taken for credit by students with credit in TCC 254 or 454.

### **TCC 460 Dress and Culture**

★3 (fi 6) (either term, 3-0-0). Senior level study of clothing behavior of individuals at stages of the life cycle and in a variety of lifestyles. Prerequisites: Graduate standing and permission of Instructor. Note: May not be taken for credit by students with credit in TCC 260.

### **01 TCC 467 Textile and Apparel Policy**

★3 (fi 6) (either term, 2-2s-0). Principles and processes of policy development, implementation and analysis; government policies and programs, including international trade agreements, and their effect on the textile and apparel industries and market. Prerequisites: TCC 266 and ECON 102.

### **01 TCC 468 19th- and 20th-Century Dress**

★3 (fi 6) (either term, 3-0-3). The class will use primary sources in museums, historic sites, art galleries, archives and especially the University Clothing and Textiles Collection, to investigate dress within a material culture context. Prerequisites: HECOL 238 and TCC 268 or consent of the instructor.

### **01 TCC 472 Textile Fibres and Finishes**

★3 (fi 6) (either term, 3-1s-2). Polymer and fibre structure-property relationships; in-depth study of fibres including production, structure, physical and chemical properties. Effect of selected finishes on performance. Prerequisites: CHEM 161 and 163; and TCC 270 or consent of Department.

### **TCC 480 Selected Topics**

★3 (fi 6) (either term, variable). Topics of current interest in clothing, textiles and design. Prerequisite: Varies with specific offering.

### **TCC 491 Research Project in Textiles and Clothing**

★3 (fi 6) (either term, 0-1s-5). Research project planned by student in consultation with faculty advisor. Preparation and presentation of seminar based on project. Open only to TCC majors who have completed 90 units of course weight. Prerequisite: consent of Instructor.

### **TCC 571 Textile Dyes and Color Science**

★3 (fi 6) (either term, 3-0-3). Study of major classes of dyes; color science and evaluation of color change; analysis of fibres by polarized light microscopy. Prerequisites: TCC 472 or consent of Instructor. Offered in alternate years.

### **01 TCC 577 Preventive Textile Conservation**

★3 (fi 6) (first term, 3-0-3). Theoretical and practical investigation of the preventive

care of textiles and costumes in museums or related institutions. Topics include an overview of deteriorating factors, as well as procedures for handling, storage, display, and preventive treatment. Museum collections and personnel will augment university lecture, seminar, laboratory and study collection facilities. Prerequisites: TCC 268, 270, and 369 or consent of Instructor.

**TCC 578 Textile Conservation Theory and Practice**

★3 (fi 6) (second term, 3-0-3). Theoretical and practical investigation of the degradation and treatment of historic textiles and costumes. Lecture and laboratory experience will include an in-depth study of factors affecting the degradation of fibres, as well as methods of cleaning, bleaching, and consolidation. Prerequisites: TCC 472 and TCC 577.

**TCC 598 Historic Resources Internship I**

★3 (fi 6) (two term, 0-1s-8). Internship with an institution involved in historic resources conservation. Normally offered in Spring/Summer by special arrangement. Prerequisite: TCC 578 or consent of Department.

**TCC 599 Historic Resources Internship II**

★3 (fi 6) (two term, 0-1s-8). Continuation of TCC 598. Normally offered in Spring/Summer by special arrangement. Prerequisites: TCC 598 and consent of Department.

## Graduate Courses

**TCC 601 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. Corequisite: HECOL 601 or consent of Department.

**TCC 602 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. Pre-/Corequisite: TCC 601 or consent of Instructor.

**TCC 660 Research in Cross-Cultural Clothing and Textiles**

★3 (fi 6) (either term, 0-3s-0). Focus to be in-depth and specific; topics selected will depend on the needs and interests of course participants and may be oriented to primary data (archival or field) and/or secondary sources. Prerequisite: consent of Instructor.

**TCC 665 Consumer Research in Textiles and Clothing**

★3 (fi 6) (either term, 0-3s-0). A study of conceptual frameworks for consumer research. Familiarization with the consumer research literature in textiles and clothing, with emphasis on developments in theory. Prerequisite: MARK 422 or CONS 220 or consent of Instructor.

**TCC 668 Curatorial Research in Clothing and Textiles**

★3 (fi 6) (either term, 0-3s-0). Investigation of past, current, and potential research of concern to museum curators. Prerequisites: TCC 369, 468 and 601; or consent of Instructor.

**TCC 670 Topics in Advanced Fibre Science**

★3 (fi 6) (either term, 0-3s-0). Selected fibre science topics. Prerequisite: consent of Instructor.

**TCC 671 Topics in Apparel Performance Evaluation**

★3 (fi 6) (either term, 0-3s-3). Selected topics in functional performance and comfort evaluation of clothing. Prerequisite: consent of Instructor.

## 201.212 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.

## 201.213 Tibetan, TIBET

Department of East Asian Studies  
Faculty of Arts

### Undergraduate Courses

**TIBET 100 Introduction to Literary Tibetan**

★3 (fi 6) (either term, 3-0-0). An introduction to Tibetan literary language up to reading simple texts.

## 201.214 Ukrainian, UKR

Department of Modern Languages and Cultural Studies:  
Germanic, Romance, Slavic  
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, or they may be encouraged to seek "Credit by Special Assessment" (see \$44.5) where 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 course, credit may be withheld.
- (4) 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.
- (5) See also INT D courses offered by the Faculty of Arts.

### Undergraduate Courses

**UKR 100 Beginners' Ukrainian**

★6 (fi 12) (two term, 3-0-2). 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 open to students with credit in Ukrainian 30.

**UKR 150 First-Year University Ukrainian**

★6 (fi 12) (two term, 3-0-1). The course consolidates a basic understanding of Ukrainian through a systematic grammar review and practice in reading, speaking and writing. Laboratory work focuses on everyday topics and contemporary culture. Prerequisite: Ukrainian 30 or consent of Department. Note: Not open to students with credit in UKR 100. Students with a final grade of 85% or more in Ukrainian 30 should consult the Department before registering in this course.

**UKR 201 Second-Year Ukrainian I**

★3 (fi 6) (first term, 3-0-1). The course develops skills and provides an overview of Ukrainian grammar. Videos, advertisements and newspaper articles serve as a basis for a variety of exercises, including student presentations. Prerequisite: UKR 100, or 150, or consent of Department.

**UKR 202 Second-Year Ukrainian II**

★3 (fi 6) (second term, 3-0-1). A continuation of UKR 201, with greater emphasis

on reading and composition. Includes films and modern short stories. Prerequisite: UKR 201 or consent of Department.

**Q UKR 253 Ukrainian Phonetics**

★3 (*fi 6*) (either term, 3-0-0). Scientific study of the Ukrainian sound system combined with practice in phonetic discrimination and transcription. Prerequisite: UKR 150, or 202, or consent of Department. Note: Not open to students with credit in UKR 453.

**Q UKR 301 Reading and Speaking Ukrainian**

★3 (*fi 6*) (either term, 3-0-0). A variety of written and audio-visual texts explore social and cultural issues, and serve as a basis for developing active vocabulary and oral proficiency. Pre- or corequisite: UKR 150, 202 or consent of Department.

**Q UKR 326 Ukrainian Culture**

★6 (*fi 12*) (two term, 3-0-0). An introduction to Ukrainian culture, with special emphasis on the interrelationship of village life with popular and elite cultures. Focus is placed on the verbal arts, ritual, material and social culture, and the manner in which these are manifested in various contexts. Language of instruction is English. No prerequisite. This course will not fulfil the Language other than English requirement of the BA degree.

**Q 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.

**Q UKR 401 Third-Year Ukrainian I**

★3 (*fi 6*) (either term, 3-0-0). Oral and written Ukrainian. Includes contemporary news items and literature. Students write letters and brief essays. Topical videos and articles serve to illustrate more complex grammatical points and develop a practical vocabulary. Prerequisite: UKR 202 or consent of Department.

**Q UKR 402 Third-Year Ukrainian II**

★3 (*fi 6*) (either term, 3-0-0). A continuation of UKR 401. Films, short stories and plays act as resources for compositions and discussions of cultural issues. Prerequisite: UKR 401 or consent of Department.

**Q UKR 413 Alexander Dovzhenko and His Contemporaries**

★3 (*fi 6*) (either term, 3-0-0). An examination of Soviet silent cinema of the 1920s in its social, political and artistic setting. Major Ukrainian and Russian silent films are examined for their formal, cultural, and political features against the background of the aesthetic and theoretical ferment of the decade. Works by A Dovzhenko, D Vertov, V Pudovkin, L Kuleshov, S Eisenstein, and others. No prerequisites. Note: Readings are available in English for students not taking Ukrainian as a major or minor.

**Q UKR 414 Futurism: East and West**

★3 (*fi 6*) (either term, 3-0-0). A comparative examination of the Futurist movement in Slavic countries (Russia, Ukraine, Poland) against the background of Italian Futurism. Poetry, prose and manifestos. Works by Mayakovsky, Khlebnikov, Marinetti, Semenka, Shkurupii and others. Prerequisite: Consent of Department. Reading knowledge of one relevant language other than English is desirable but not essential. Note: Readings are available in English for students not taking Ukrainian as a major or minor.

**Q 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.

**Q UKR 422 Ukrainian Folk Poetry**

★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: UKR 301 or consent of Department.

**Q 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 301 or consent of Department.

**Q 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. Prerequisites: UKR 301 and ANTHR 207 or consent of Department.

**Q 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. Prerequisites: UKR 301 and ANTHR 207 or consent of Department.

**Q UKR 427 Ukrainian Material Culture**

★3 (*fi 6*) (either term, 3-0-0). Investigation of selected aspects of the vernacular

material culture of Ukrainians and Ukrainian Canadians, including village dress, architecture, agricultural techniques, and folk crafts. Prerequisites: UKR 301 and ANTHR 207 or consent of Department.

**Q UKR 428 Ukrainian Folk Art and Performance**

★3 (*fi 6*) (either term, 3-0-0). Investigation of selected aspects of Ukrainian folk arts, their performance processes and material manifestations. Topics include embroidery, egg decoration, folk medicine, games, folk movement, and drama. Prerequisites: UKR 301 and ANTHR 207 or consent of Department.

**Q UKR 451 Cultural History of the Ukrainian Language**

★3 (*fi 6*) (either term, 3-0-0). The growth and development of Ukrainian from its origins to the present day. Prerequisite: UKR 150, or 202, or consent of Department.

**Q UKR 454 Ukrainian Morphology**

★3 (*fi 6*) (either term, 3-0-0). Study of the morphological system of Ukrainian. Prerequisite: UKR 253 or consent of Department.

**Q UKR 455 Contrastive Linguistics: Ukrainian-English**

★3 (*fi 6*) (either term, 3-0-0). Contrastive study of the structures of Ukrainian and English with emphasis on problems of language learning. Prerequisite: UKR 150, or 202, or 253, or consent of Department.

**Q UKR 456 Ukrainian Syntax**

★3 (*fi 6*) (either term, 3-0-0). Linguistic study of the syntactic system of Ukrainian. Prerequisite: UKR 150 or 202, or consent of Department.

**Q UKR 470 Medieval and Early-Modern Ukrainian Literature**

★3 (*fi 6*) (either term, 3-0-0). A survey in English of the legacy of Kievan and Galician-Volhynian Rus' (11th-15th centuries) and the cultural renaissance of the 16th-18th centuries. Lectures in English. Modern Ukrainian translations available to students majoring or minoring in Ukrainian. Prerequisite: consent of Department. Note: Readings are available in English for students not taking Ukrainian as a major or minor.

**Q 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 Metlinsky, and M Kostomarov to P Kulish, with special emphasis on T Shevchenko. Prerequisite: UKR 301 or corequisite: UKR 401 and 402, or consent of Department.

**Q 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 301; or corequisites UKR 401 and 402, or consent of Department.

**Q 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 301; or corequisites UKR 401 and 402, or consent of Department.

**Q UKR 474 Ukrainian Literature: Diaspora and Dissent**

★3 (*fi 6*) (either term, 3-0-0). Works in the diaspora (1940s - 1980s) are compared and contrasted with Soviet Ukraine's official and dissident literature. The focus is on the New York Group and the writers of the Sixties, with emphasis on their innovations in poetic language and themes. Prerequisite: consent of Department. Note: Readings are available in English for students not taking Ukrainian as a major or minor.

**Q 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 479 Honors Thesis**

★3 (*fi 6*) (variable, 3-0-0). Directed Honors thesis research. Note: Required of all BA (Honors) students majoring in Ukrainian who are in their final year of study.

**Q UKR 491 Advanced Ukrainian I**

★3 (*fi 6*) (first term, 3-0-0). Composition, style and practical oral expression. Emphasis is on improving writing skills. Basic discourse analysis. Print and audio-visual texts supplement the course. Prerequisite: UKR 402, or consent of Department.

**Q UKR 492 Advanced Ukrainian II**

★3 (*fi 6*) (second term, 3-0-0). Continuation of UKR 491. The study of complex constructions, nuances of meaning and stylistic devices. Introduction to the principles of translating from Ukrainian into idiomatic English. Prerequisite: UKR 491, or consent of Department.

**UKR 497 Conference Course (Folklore)**

★3-6 (*variable*) (variable, 3-0-0). Students as well as staff may initiate proposals in any given year for the content of this course. Please consult the Department for the procedure for student-initiated proposals.

**UKR 498 Conference Course (Linguistics)**

★3-6 (*variable*) (variable, 3-0-0). Students as well as staff may initiate proposals in any given year for the content of this course. Please consult the Department Chair for the procedure for student-initiated proposals.

**UKR 499 Conference Course (Literature)**

★3-6 (*variable*) (variable, 3-0-0). Students as well as staff may initiate proposals in any given year for the content of this course. Please consult the Department Chair for the procedure for student-initiated proposals.

**Graduate Courses****UKR 511 The Structure of Ukrainian**

★3 (*fi 6*) (either term, 3-0-0).

**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.

**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.

**UKR 517 Ukrainian Dialectology**

★3 (*fi 6*) (either term, 3-0-0).

**UKR 522 Ukrainian Folk Poetry**

★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.

**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.

**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.

**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.

**UKR 527 Ukrainian Material Culture**

★3 (*fi 6*) (either term, 3-0-0). Investigation of selected aspects of the vernacular material culture of Ukrainians and Ukrainian Canadians, including village dress, architecture, agricultural techniques, and folk crafts.

**UKR 528 Ukrainian Folk Art and Performance**

★3 (*fi 6*) (either term, 3-0-0). Investigation of selected aspects of Ukrainian folk arts, their performance processes and material manifestations. Topics include embroidery, egg decoration, folk medicine, games, folk movement, and drama.

**UKR 531 History of Ukrainian Folklore Studies**

★3 (*fi 6*) (either term, 3-0-0).

**UKR 532 Ukrainian Folklore in Canada**

★3 (*fi 6*) (either term, 3-0-0).

**UKR 551 Cultural History of the Ukrainian Language**

★3 (*fi 6*) (either term, 3-0-0). The growth and development of Ukrainian from its origins to the present day.

**UKR 555 Teaching Strategies for Postsecondary Language Instructors of Ukrainian**

★3 (*fi 6*) (first term, 3-0-0). Designed to help graduate teaching assistants develop practical expertise in the instruction of Ukrainian at the college and university levels.

**UKR 591 Advanced Ukrainian I**

★3 (*fi 6*) (first term, 3-0-0). Composition, style and practical oral expression. Emphasis is on improving writing skills. Basic discourse analysis, Print and audio-visual texts supplement the course.

**UKR 592 Advanced Ukrainian II**

★3 (*fi 6*) (second term, 3-0-0). Continuation of UKR 591. The study of complex constructions, nuances of meaning and stylistic devices. Introduction to the principles of translating from Ukrainian into idiomatic English.

**UKR 599 Directed Reading (Ukrainian Literature)**

★3-6 (*variable*) (variable, 3-0-0).

**UKR 631 Ukrainian Folklore Theory Studies**

★3 (*fi 6*) (either term, 3-0-0).

**UKR 632 Ukrainian Folklore Research Methods**

★3 (*fi 6*) (either term, 3-0-0).

**UKR 641 Studies in Ukrainian Poetry**

★3 (*fi 6*) (either term, 3-0-0). Detailed study of major poetic works of the 19th and 20th centuries.

**UKR 642 Studies in Ukrainian Drama**

★3 (*fi 6*) (either term, 3-0-0). Detailed study of major dramatic works of the 19th and 20th centuries.

**UKR 643 Studies in the Ukrainian Novel and Short Prose**

★3 (*fi 6*) (either term, 3-0-0). Detailed study of major prose works of the 19th and 20th centuries.

**UKR 644 Studies in Ukrainian Modernism**

★3 (*fi 6*) (either term, 3-0-0). The major modernist and avant-garde trends from the 1890s to 1930.

**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 Conference Course (Folklore)**

★3-6 (*variable*) (variable, 3-0-0). A detailed study of a folklore problem or genre not dealt with in the other courses. Designed to meet the needs of individual Graduate Students.

**UKR 698 Conference Course (Linguistics)**

★3-6 (*variable*) (variable, 3-0-0). A detailed study of an area of Ukrainian linguistics not dealt with in the other Honors or Graduate courses. May be initiated by either staff or students as need arises.

**UKR 699 Conference Course (Literature)**

★3-6 (*variable*) (variable, 3-0-0). A detailed study of a literary problem, period, or genre not dealt with in the other courses. Designed to meet the needs of individual Honors or Graduate students.

**201.215 Université, UNTE**

Faculté Saint-Jean

**Cours de 1er cycle****UNTE 101 Initiation aux études universitaires**

★0 (*fi 2*) (l'un ou l'autre semestre, 12 hours). Une série de séminaires visant à faciliter la réussite académique au niveau universitaire. Méthodes d'étude et de recherche. Introduction au réseau des bibliothèques et à l'utilisation de l'Internet. Note ce cours est obligatoire pour tous les étudiants de première année inscrits à la Faculté Saint-Jean.

**201.216 University, UNIV**

Faculty of Agriculture, Forestry, and Home Economics

**Undergraduate Courses****UNIV 100 First-Year Experience**

★2 (*fi 4*) (first term, 0-2s-0). Examines topics relevant to successful academic performance including study skills, use of campus resources, stress management, and career planning. University regulations, faculty expectations, pathways to academic excellence, and practical methods for surviving the challenges of first year on campus are covered. (Open only to students in the Faculty of Agriculture, Forestry, and Home Economics.)

**201.217 Women's Studies, W ST**

Women's Studies Program  
Faculty of Arts

**Undergraduate Courses****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. Not open to students who have successfully completed W ST 200.

**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 Department. Not open to students who have successfully completed W ST 200.

**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. Prerequisites: W ST 200, or 201 and 202 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 200, or 201 and 202 or consent of the Program.

**W ST 305 Women and Work**

★3 (fi 6) (either term, 0-3s-0). This course surveys women's paid employment, and domestic work, examining the nature of work women do and the interrelation between different forms of female labor. Canada provides the focal point of the course, with comparisons being drawn to other industrialized countries. Prerequisite: W ST 200 or consent of Program.

**W ST 310 Women in Development**

★3 (fi 6) (either term, 3-0-0). This course deals with development issues, such as work, health, environment, and human rights among women in developing countries. Prerequisite: W ST 200 or consent of the Program. This course is 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 200, or 201 and 202 or consent of the Program.

**W ST 330 Feminist Perspectives on Women, Counselling and Psychoanalysis**

★3 (fi 6) (either term, 3-0-0). This course studies women's relationship to counselling and psychoanalysis from interdisciplinary and feminist points of view. Gender, mental illness and 'madness' will be examined from within historical, social and theoretical frameworks. Prerequisite: W ST 200, or 201 and 202 or consent of the Program.

**W ST 340 Recent Developments in Women's Spirituality**

★3 (fi 6) (either term, 3-0-0). There will be an advanced focus on such themes as (1) the nature and purpose of women's agency; (2) the relations among rationality, spirituality, sexuality, and economic realities for women; and (3) women's spirituality as a motivator for social change. Prerequisites: W ST 200, or 201 and 202 or consent of the Program.

**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 200, or 201 and 202 or consent of the Program.

**W ST 400 Feminist Ethics: An Interdisciplinary Approach**

★3 (fi 6) (either term, 0-3s-0). A critical exploration of moral agency, moral language, moral identity, moral relationships, and moral community in the context of asymmetrical power as these relate to selected ethical issues affecting women's lives. Prerequisite: W ST 200, or 201 and 202 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. May be taken only once. Prerequisite: W ST 200, or 201 and 202 or consent of the Program.

**W ST 402 Honors Seminar and Project**

★6 (fi 12) (two term, 0-3s-0). Prerequisites: W ST 200, or 201 and 202, 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 200, or 201 and 202 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 200, or 201 and 202 or consent of the Program.

**W ST 497 History of Women and Health**

★3 (fi 6) (either term, 0-3s-0). This seminar examines the multicultural history of women as health practitioners, patients, and health activists in North America. Prerequisite: W ST 200, or 201 and 202 or consent of the Program.

**W ST 498 Topics in Women's Studies**

★3 (fi 6) (either term, 0-3s-0). Prerequisite: W ST 200, or 201 and 202 or consent of the Program.

**Graduate Courses****W ST 500 Directed Reading in Women's Studies**

★3 (fi 6) (either term, 0-3s-0).

**201.218 Work Experience, WKEXP**

University of Alberta

**Note:** For information regarding fees for work experience courses, see \$22.2.1.

**Undergraduate Courses****201.218.1 Faculty of Agriculture, Forestry, and Home Economics Courses****WKEXP 981 Agriculture, Forestry, and Home Economics Work Experience I**

★0 (fi 9) (either term or Spring/Summer, unassigned). A four-month work placement for Faculty of Agriculture, Forestry, and Home Economics students admitted into the Internship program. The focus of the work experience will be for the student to gain an appreciation of the work environment.

**WKEXP 982 Agriculture, Forestry, and Home Economics Work Experience II**

★0 (fi 9) (either term, unassigned). A four-month work placement for Faculty of Agriculture, Forestry, and Home Economics students admitted into the Internship program. The focus of the work experience will be for the student to gain experience in his or her chosen field of specialization. Prerequisite: WKEXP 981.

**WKEXP 983 Agriculture, Forestry, and Home Economics Work Experience III**

★0 (fi 9) (either term, unassigned). A four-month work placement for Faculty of Agriculture, Forestry, and Home Economics students admitted into the Internship program. The work experience will employ the student in work directly related to a chosen specialization. Prerequisite: WKEXP 982.

**201.218.2 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.

**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.

**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.

**WKEXP 970 Honors Work Term**

★0 (*fi 9*) (either term, unassigned). Prerequisites: Department and Faculty approval.

**WKEXP 971 Honors Work Assignment**

★0 (*fi 6*) (either term, unassigned). Prerequisites: Department and Faculty approval.

**201.218.3 Faculty of Business Courses****WKEXP 911 Business Work Experience I**

★0 (*fi 12*) (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 12*) (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 12*) (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 and of sufficient technical merit to show a good understanding of a particular area of study in Business. 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.

**201.218.4 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. (★0.5)

**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. (★0.5)

**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. (★0.5)

**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. (★0.5)

**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. (★3)

**201.218.5 Faculty of Science Courses****WKEXP 401 Chemistry Work Experience**

★0 (*fi 9*) (first term, unassigned). A four-month work placement for Chemistry students admitted to the Industrial Internship program.

**WKEXP 402 Chemistry Work Experience**

★0 (*fi 9*) (second term, unassigned). A four-month work placement for Chemistry students admitted to the Industrial Internship program.

**WKEXP 403 Chemistry Work Experience**

★0 (*fi 9*) (Spring/Summer, unassigned). A four-month work placement for Chemistry students admitted to the Industrial Internship Program.

**WKEXP 411 EAS Work Experience**

★0 (*fi 9*) (either term or Spring/Summer, unassigned). A four-month work placement for Earth and Atmospheric Sciences students admitted to the Industrial Internship Program. Work Experience course registrations must be contiguous.

**WKEXP 412 EAS Work Experience**

★0 (*fi 9*) (either term or Spring/Summer, unassigned). A four-month work placement for Earth and Atmospheric Sciences students admitted to the Industrial Internship Program. Work Experience course registrations must be contiguous. Prerequisite: WKEXP 411.

**WKEXP 413 EAS Work Experience**

★0 (*fi 9*) (either term or Spring/Summer, unassigned). A four-month work placement for Earth and Atmospheric Sciences students admitted to the Industrial Internship Program. Work Experience course registrations must be contiguous. Prerequisite: WKEXP 412.

**WKEXP 421 Physics and Environmental Physical Sciences Work Experience**

★0 (*fi 9*) (first term, unassigned). A four-month work placement for Physics and Environmental Physical Sciences students admitted to the Industrial Internship Program.

**WKEXP 422 Physics and Environmental Physical Sciences Work Experience**

★0 (*fi 9*) (second term, unassigned). A four-month work placement for Physics and Environmental Physical Sciences students admitted to the Industrial Internship Program.

**WKEXP 423 Physics and Environmental Physical Sciences Work Experience**

★0 (*fi 9*) (Spring/Summer, unassigned). A four-month work placement for Physics and Environmental Physical Sciences students admitted to the Industrial Internship Program.

**WKEXP 921 Computing Science Introductory Work Experience**

★0 (*fi 9*) (first term, unassigned). A required four-month work experience placement for Computing Science Honors or Specialization students admitted into the Industrial Internship Program. The focus of the work experience will be for the student to gain an in-depth appreciation of the computing profession.

**WKEXP 922 Computing Science Advanced Work Experience**

★0 (*fi 9*) (second term, unassigned). A required four-month work experience for Computing Science Honors or Specialization students admitted into the Industrial Internship Program. The focus of the work experience will be for the student to perform work directly related to their specialization with sufficient technical and professional merit expected of a computing professional. Prerequisite: WKEXP 921.

**WKEXP 923 Computing Science Work Experience**

★0 (*fi 9*) (Spring/Summer, unassigned). A required four-month work experience placement for Computing Science Honors or Specialization students admitted into the Industrial Internship Program. The focus of the work experience will be for the students to perform in-depth work directly related to the advanced technical and professional skill level expected of a computing professional. Prerequisite: WKEXP 922.

**WKEXP 931 Psychology Work Experience I**

★0 (*fi 9*) (first 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.

**WKEXP 932 Psychology Work Experience II**

★0 (*fi 9*) (second 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.

**WKEXP 933 Psychology Work Experience III**

★0 (*fi 9*) (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 932.

**WKEXP 941 Science Work Experience I**

★0 (*fi 9*) (first term, unassigned). A four-month work placement for Biological



Sciences students admitted into the Industrial Internship Program. The focus of the work experience will be for the student to gain an appreciation of the work environment.

#### WKEXP 942 Science Work Experience II

★0 (*fi 9*) (second term, unassigned). A four-month work placement for Biological Sciences students admitted into the Industrial Internship Program. The focus of the work experience will be for the student to gain experience in his or her chosen field of specialization. Prerequisite: WKEXP 941.

#### WKEXP 943 Science Work Experience III

★0 (*fi 9*) (Spring/Summer, unassigned). A four-month work placement for Biological Sciences students admitted into the Industrial Internship Program. The focus of the work experience will be for the student to perform work directly related to his or her specialization and of sufficient technical merit to show a good understanding of a particular area of study in Biological Sciences. Prerequisite: WKEXP 942.

## Graduate Courses

### 201.218.6 Faculty of Science Courses

#### WKEXP 951 Mathematical Sciences Work Experience I

★0 (*fi 9*) (first term, unassigned). A four-month work placement for Honors and Specialization students in the Mathematical Sciences 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.

#### WKEXP 952 Mathematical Sciences Work Experience II

★0 (*fi 9*) (second term, unassigned). A four-month work placement for Honors and Specialization students in the Mathematical Sciences Industrial Internship Program. The focus of the work experience will be for the student to gain further knowledge of the work environment. Prerequisite: WKEXP 951.

#### WKEXP 953 Mathematical Sciences Work Experience III

★0 (*fi 9*) (Spring/Summer, unassigned). A four-month work placement for Honors and Specialization students in the Mathematical Sciences Industrial Internship Program. The focus of the work experience is to further the student's knowledge of the working world. Prerequisite: WKEXP 952.

## 201.219 Writing, WRITE

Department of English  
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: ENGL 100, 101 (or equivalent), and consent of Instructor(s) based on a portfolio (see Instructor for deadline).

#### WRITE 295 Introduction to Writing Prose

★3 (*fi 6*) (either term, 3-0-0). Lectures and workshops in which the student will be required to write prose. Prerequisites: ENGL 100, 101 (or equivalent), and consent of Instructor(s) based on a portfolio (see Instructor for deadline).

#### WRITE 298 Introduction Non-Fiction Writing

★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: ENGL 100, 101 (or equivalent).

#### 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 398 Intermediate Non-Fictional Writing

★6 (*fi 12*) (two term, 3-0-0). Prerequisite: WRITE 298 unless waived by Instructor.

#### 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). Prerequisites: WRITE 395 unless waived by Instructor. Consult Instructor for portfolio deadline.

#### WRITE 498 Advanced Non-Fiction Writing

★3 (*fi 6*) (either term, 3-0-0). Prerequisites: WRITE 398 or former ENGL 398 and consent of 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.

## 201.220 Zoology (Biological Sciences), Z00L

Department of Biological Sciences  
Faculty of Science

### Notes

- (1) See the following sections for listings of other Biological Sciences courses: Biology (BIOL); Botany (BOT); Entomology (ENT); Genetics (GENET); Microbiology (MICRB).
- (2) See also INT D 490 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.
- (3) See also courses listed under Biology (BIOL), Botany (BOT), Marine Science (MA SC), or Paleontology (PALEO).
- (4) Specified prerequisites for senior courses may be waived for advanced students; consult the Department.
- (5) Where a course prerequisite is a Biological Sciences course, courses titled Biology, Botany, Entomology, Genetics, Microbiology, Paleontology, and Zoology may be used.
- (6) Not all senior courses are offered every year. Check with the Biological Sciences Student Services Officer (CW312 Biological Sciences) for current offerings.

### Undergraduate Courses

#### Z00L 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.

#### Z00L 225 Comparative Anatomy of the Vertebrates

★3 (*fi 6*) (second term, 3-0-3). Comparative anatomy of the vertebrates with special emphasis on the mammals. Prerequisite: BIOL 108. Z00L 224 strongly recommended.

#### Z00L 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 Z00L 242 prior to 1996/97 or PHYSL 210 may not obtain credit in Z00L 241. Prerequisite: BIOL 107.

#### Z00L 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 PHYSL 210 may not obtain credit in Z00L 242. Prerequisite: BIOL 107.

#### Z00L 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.

#### Z00L 301 Natural History of the Vertebrates of Alberta

★3 (*fi 6*) (second term, 3-0-3). The identification, distribution, habitats, and life histories of the fishes, amphibians, reptiles, birds, and mammals of Alberta. Prerequisite: A 200-level Biological Sciences course. Prerequisite: Z00L 224 is recommended.

#### Z00L 302 Invertebrate Development

★3 (*fi 6*) (second term, 3-0-3). Reproduction, embryonic, and postembryonic development in invertebrates with emphasis on insects. Prerequisite: BIOL 201. Z00L 250 is recommended.

#### Z00L 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. Credit may be obtained in only one of Z00L 202 and Z00L 303.

#### Z00L 332 Animal Community Ecology

★3 (*fi 6*) (second term, 3-0-3). A study of niche theory: food webs; competition, predation, disturbance, and their effects on community diversity; diversity gradients; island biogeography; taxon cycles; convergence of community structure. Prerequisite: BIOL 208; STAT 151; and any one of MATH 113, 115, or 120. Offered in alternate years.

#### Z00L 340 Environmental Physiology

★3 (*fi 6*) (first term, 3-0-0). The influence of environmental variables on animal function. Prerequisite: Z00L 241. Offered in alternate years.

**ZOOL 341 Energy Metabolism and Water Balance**

★3 (fi 6) (first term, 3-0-0). A comparative approach to the physiological, cellular, and biochemical aspects of energy metabolism and water balance, their support by respiratory and circulatory functions, and regulation by neural and hormonal mechanisms. Emphasis will be on conceptual and integrated understanding of functions at the organismic level, often illustrated using vertebrates. Prerequisite: ZOOL 241.

**ZOOL 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: ZOOL 242 or PHYSYL 210.

**ZOOL 343 Comparative Endocrinology**

★3 (fi 6) (second term, 3-0-0). Endocrine systems and actions of hormones in vertebrates and invertebrates. Prerequisite: ZOOL 242.

**ZOOL 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: ZOOL 241 or ZOOL 242 or PHYSYL 210.

**ZOOL 351 Aquatic Invertebrates of Alberta**

★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: ZOOL 250.

**ZOOL 352 Principles of Parasitism**

★3 (fi 6) (first term, 3-3s-0). An introduction of protozoan, helminth and arthropod parasites of animals; principles of host and parasite adaptations, host defence, epidemiology, and disease. Laboratory tutorials emphasize morphology, life cycles, and systematics of parasites. Prerequisite: ZOOL 250.

**ZOOL 354 Wildlife Disease**

★3 (fi 6) (second term, 3-0-3). Etiology, ecology, and pathogenesis of parasitic, viral, bacterial, and non-infectious diseases of mammals, birds, and fish. Laboratory projects emphasize methods for the study of parasites of wild hosts. Prerequisite: ENCS 376, FOR 365, MICRB 265, or a 200-level course in Zoology (ZOOL 352 recommended). Offered in alternate years.

**ZOOL 355 Invertebrate Biology**

★3 (fi 6) (first term, 3-0-3). The functional morphology and biomechanics of invertebrate organisms. The emphasis will be on the higher invertebrates. Prerequisite: ZOOL 250. Credit may not be obtained for both ZOOL 355 and ENT 317.

**ZOOL 370 Ethological Mechanisms**

★3 (fi 6) (first 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 ZOOL 371. (Alternates with ZOOL 371.) Prerequisite or corequisite: ZOOL 241 or 242.

**ZOOL 371 Behavioral Ecology and Sociobiology**

★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 ZOOL 370. (Alternates with ZOOL 370.) Prerequisite: BIOL 208

**ZOOL 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: ZOOL 302 or 303. Credit for this course may be obtained more than once.

**ZOOL 405 Ichthyology**

★3 (fi 6) (first term, 3-0-3). A comparative survey of living and fossil fishes focusing on their classification, ecology, morphology, and evolution, as well as unique aspects of their biology. Prerequisites: ZOOL 224, 225, and a 300-level ZOOL. ZOOL 301 strongly recommended. Offered in alternate years. Credit may not be obtained for both ZOOL 405 and 305.

**ZOOL 407 Ornithology**

★3 (fi 6) (first term, 3-0-3). A comparative survey of living and fossil birds, focusing on their classification, ecology, morphology, and evolution, as well as unique aspects of their biology. Prerequisites: ZOOL 224, 225, and a 300-level ZOOL. ZOOL 301 strongly recommended. Offered in alternate years.

**ZOOL 408 Mammalogy**

★3 (fi 6) (second term, 3-0-3). A comparative survey of living and fossil mammals, focusing on their classification, ecology, morphology, and evolution, as well as unique aspects of their biology. Prerequisites: ZOOL 224, 225, and a 300-level ZOOL. ZOOL 301 strongly recommended. Offered in alternate years. Credit may not be obtained for both ZOOL 408 and 304.

**ZOOL 427 Insect Taxonomy**

★3 (fi 6) (first term, 2-0-6). To provide a base for understanding the evolution, diversity, phylogeny, distribution, and classification of hexapods and practical experience in their identification. Prerequisite: ENT 220, BIOL 335 is a useful corequisite. Credit may not be obtained for both ENT 327 and 427.

**ZOOL 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 will take place during four weeks of class time in September. Prerequisites: BIOL 331 or ZOOL 332 or 371; a statistics course or BIOL 430. This course requires payment of additional miscellaneous fees. See §22.2.3 for details.

**ZOOL 441 Current Topics on Homeostasis**

★3 (fi 6) (first 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: ZOOL 340 or 341. Credit for this course may be obtained more than once.

**ZOOL 442 Current Topics in Intercellular Communication**

★3 (fi 6) (second 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: ZOOL 342 or 343 or 352 or PMCOL 371. Credit for this course may be obtained more than once.

**ZOOL 452 Experimental Parasitology**

★3 (fi 6) (second term, 3-0-3). Experimental approaches to study parasitism, including topics on ecology, biochemistry, physiology, genetics, and immunology of host-parasite relationships. Laboratory exercises cover experimental design and methods of collecting and processing host and parasite samples, with emphasis on parasites of laboratory hosts. Prerequisite: ZOOL 352 or consent of Department.

**ZOOL 474 Research in Animal Behavior**

★3 (fi 6) (second term, 0-1s-4). Students design and conduct individual research in animal behavior. Weekly seminars deal with research and preparation of oral and written research reports. Prerequisite: ZOOL 370 or 371.

**Graduate Courses****Notes**

- (1) All 300- and 400-level courses in the Department of Biological Sciences may be taken for credit 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, 540, 541, 550, 555, 560; CHEM 361, 363, 461; CELL 300, 301; INT D 371, 372, 421, 452, 455, 464, 543, 544, 545, 551; MA SC 400, 401, 402, 410, 412, 420, 425, 430, 437, 440, 445, 450, 454, 470, 480; MMI 350, 405, 415, 516, 520; NEURO 472, 503, NU FS 363; PALEO 318, 319; PHARM 601.

**ZOOL 552 Advanced Parasitology**

★3 (fi 6) (second term, 0-3s-6). Individual projects and seminars emphasize the use of parasites as model systems to study fundamental questions in biology. Prerequisite: ZOOL 452 or consent of Department.

**ZOOL 657 Biology of Parasites**

★3 (fi 6) (either term, 3-0-0). Lectures and discussion of selected topics in parasitology. Credit for this course may be obtained more than once.