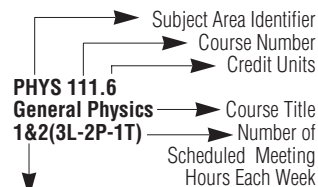


COURSES

Not all courses described in the Calendar are offered each Regular Session. For a time table of courses offered in 2002-2003 please consult the Registration Guide at www.usask.ca/registrar.

KEY TO COURSE DESCRIPTIONS

Throughout this *Calendar*, the following convention may be observed in course descriptions:



Term in Which Class is Held

The following term designations are used:

- 1—Term 1 only
- 2—Term 2 only
- 3—Term 3 only
- 1&2—Term 1 and 2
- 1/2—Either Term 1 or 2
- P—Phases (Medicine and Dentistry)
- Q—Quarters (Veterinary Medicine)

The following instructional code designations are used:

- L—Lecture
- P—Practicum/Lab
- S—Seminar/Discussion
- C—Clinical Service
- R—Reading
- T—Tutorial

Credit Units

The credit unit is a number associated with a course that indicates its academic weight relative to other courses. Normally, courses completed in one term have a weight of 3 credit units while courses completed over two terms have a weight of 6 credit units.

COURSE NUMBERING

Courses at the University are numbered according to the following convention:

Non-University Level

001-089 Courses intended primarily for non-degree credit programs (e.g., Business Administration Certificate and Diploma in Agriculture courses).

Undergraduate Degree

• Junior level

090-099 Courses which do not require Grade 12 level preparation as a prerequisite. These numbers are used when a department also offers a junior level course in a subject for students with Grade 12 preparation.

100-109 General introductory courses not usually intended as preparation for more advanced study in the subject but designed to acquaint students with a field of knowledge in which they do not propose to specialize.

110-199 All other courses offered for junior undergraduate level credit.

• Senior level

200-699 Courses intended for the upper years of direct entry degree programs or for all years of non-direct entry programs. In direct entry programs the first digit will usually indicate the year of the program for which the course has been designed. For non-direct entry programs, first year courses are numbered 200-299, second year courses 300-399, etc.

Graduate Degree

• Junior level

700-799 Introductory courses, usually intended for graduate students who have not had the generally expected undergraduate preparation in the subject.

• Senior level

800-899 Courses which may be taken only by students who have completed the undergraduate level preparation generally expected for graduate level courses in the subject.

990 Graduate seminars.

992 Graduate projects.

994 Master's Program Thesis.

996 Doctoral Program Thesis.

ACCOUNTING

Department of Accounting, College of Commerce

See also Accounting courses listed under Commerce in this section of the *Calendar*.

ACC 400.3 Honours Seminar in Accounting 1&2(1.5S)

Prerequisite(s): Admission to the B.COMM Honours Program.

Students in the Accounting Honours program shall register in this course. Readings in research methodology will be assigned and the student will conduct a research project under the supervision of a faculty member. A report on the research will be presented to the regular Department Research Seminar. Students registered in this course must attend this regular Department Seminar.

GRADUATE COURSES

Department of Accounting, College of Graduate Studies & Research

Master of Science in Accounting

ACC 814.3 The Auditing Profession 1(3S)

Examines the economic, social, and professional determinants of an auditor's work environment. In addition, the auditor judgment process is examined through study of various theories and models from the psychology of information processing. Empirical applications of these models are considered in terms of auditor's judgments regarding issues such as analytical procedures and aggressive financial reporting.

ACC 823.3 Management Accounting and Control Processes 1(3S)

Examines academic research in selected areas within the managerial accounting and control literature. Current research examining cost accounting systems (e.g., activity-based costing) and management control processes, including strategy, structure, performance measurement and evaluation, are discussed. Research papers discussed cover different methods (e.g., case studies, experiments, surveys).

ACC 824.3 Accounting Information and Capital Markets 1(3S)

Explores both traditional and contemporary theories and research in financial accounting with a focus on empirical research. Paradigms that will be studied in depth include capital markets and costly contracting research.

ACC 825.3 The Evolution of Accounting Practices 1(3S)

The evolution of accounting thought and practices is examined with regard to both its internal and external dimensions. Sources of influence are traced and their relationship to present practices and to the future is sought.

ACC 827.3 Research Methodology in Accounting 1(S, 2 weeks)

Introduces students to a wide range of research approaches appropriate to, and illustrative of, current accounting research. The course prepares students to effectively use these approaches in their own research and to critically evaluate research done by others.

ACC 898.3 Selected Readings in Accounting 1(R)

Selected readings will be offered in specialized areas of scholarship within the department upon approval of the Graduate Accounting Committee.

ACC 990 Research Seminar

A forum in which faculty members, visiting professors and M.Sc. students will present research papers.

ACC 994 Research in Accounting

Students undertaking research should register in this course each year until completion of the program.

Master of Professional Accounting

MPACC 801.2 The Business Environment 1/2

Prerequisite(s): Admission to Graduate Studies and permission of the department.
Focuses on current developments in the internal and external environments of modern business and administrative organizations and their implications for the accountant of tomorrow.

MPACC 802.3 Corporate Financial Management 1/2

Prerequisite(s): Admission to Graduate Studies and permission of the department.
Provides comprehensive coverage of finance theories/concepts and techniques essential to the professional accountant in his/her roles as financial information preparer, auditor and financial advisor.

MPACC 803.4 Financial Reporting and Accountability 1/2

Prerequisite(s): Admission to Graduate Studies and permission of the department.
Provides an in-depth understanding of the major financial reporting issues facing professional accountants.

MPACC 804.4 Strategic Management Accounting 1/2

Prerequisite(s): Admission to Graduate Studies and permission of the department.
This is a capstone course in management accounting which serves to review previous managerial concepts, to integrate them into a wider management decision making framework, and show how cost information needs to be related to the broader, strategic context of the organization.

MPACC 805.3 Managing the Modern Business 1/2

Prerequisite(s): Admission to Graduate Studies and permission of the department.
Prepares accountants to be more influential in delivering their expertise in organizational decision making and to enable them to be appropriately influenced by non-accounting organizational members.

MPACC 806.4 Auditing 1/2

Prerequisite(s): Admission to Graduate Studies and permission of the department.
Examines the fundamental and current issues in auditing modern businesses, government entities, and non-for-profit organizations.

MPACC 807.2 Information Systems 1/2

Prerequisite(s): Admission to Graduate Studies and permission of the department.
Focuses on the analysis, design and implementation of computer-based accounting and management information systems, using both traditional and object-oriented methods. The course also examines the impact of computer-based systems on internal control and auditing.

MPACC 808.4 Taxation 1/2

Prerequisite(s): Admission to Graduate Studies and permission of the department.
Covers the tax issues, problems and planning opportunities professional accountants encounter in providing tax services. The course also reviews the legal, economic and political framework within which tax policy is developed as well as the future direction of tax policy.

**MPACC 809.3
Entrepreneurship
1/2**

Prerequisite(s): Admission to Graduate Studies and permission of the department. Using the viewpoint of the small business owner/manager and the small business this course examines the research, analytical, and planning processes required for the successful start-up and long run continuation of a business venture.

**MPACC 810.6
Integration
1&2**

Prerequisite(s): Admission to Graduate Studies and permission of the department. This is the capstone course of the master of professional accounting program. The course focuses on application and integration of the multi-disciplinary knowledge required for the successful practice of professional accounting.

**MPACC 992.3
Research Project
1/2**

Prerequisite(s): Admission to Graduate Studies and permission of the department. Provides students an opportunity to develop research skills through completing a research project of importance to the accounting profession. The focus of this research can be financial accounting or reporting, management accounting, auditing or taxation.

**AGRICULTURAL AND
BIORESOURCE ENGINEERING**

Department of Agricultural and Bioresource Engineering, College of Engineering

DIPLOMA COURSES

**AB E 51.6
Introduction to Agricultural
Equipment
2(3L-2P)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture. Introduction to production agricultural field equipment with emphasis on optimizing machine performance. Topics discussed include farm tractors, tillage, fertilizer and chemical application, and seeding and harvesting grain and forages. Laboratories will allow students to gain practical understanding of concepts introduced during lectures.

**AB E 52.6
Agricultural Power
2(3L-2P)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture. A systems study of internal combustion engines and power-transfer machinery components as used in modern agricultural enterprises. Students will become familiar with the function and interaction of components in mobile agricultural power sources and power-transfer mechanisms. They will gain an understanding of power flow through machines from the source to the work component. Discussions will

include topics related to internal combustion engine systems, clutches, transmissions, differentials, final drives, PTO's, hydraulics, hydrostatic drives, and chain and belt drives. Machinery management, including scheduled maintenance programs, machine replacement strategies and machine cost analyses will be discussed.

**AB E 61.6
Primary and Secondary Processing
of Agricultural Products
1(3L-2P)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture. This course will lead students through topics related to both primary and secondary processing of raw materials used in the agri-food industry. Students will gain an appreciation of properties of agricultural materials and foods and feeds of plant and animal origin, and of the interaction between air, water and materials in post-harvest and manufacturing processes. Major topics in post-harvest technology will be considered, with emphasis on drying, cooling, storing, grading, sorting and transport of agricultural products. In addition, utilization and further processing of various commodities (cereals, oilseeds, dairy products, meat and special crops) will be presented, including chemical composition, processing technologies, storage and packaging. Interrelationships of the various components of the value-added chain will be emphasized, because factors influencing the quality of various raw materials have a significant impact on the ultimate utility and value of products to the consumer.

**AB E 72.6
Livestock Facilities
2(3L-2P)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture. Planning, operation and maintenance of livestock facilities are discussed. Students will learn to plan the renovation or expansion of building and penning systems for indoor and outdoor facilities. Alternative systems for materials handling, including water, feed, manure and animals will be discussed. The use of utilities, including electricity and natural gas, in animal facilities will be considered. Construction technology and materials will be introduced.

**AB E 75.6
Electronics and Controls in
Agriculture
2(3L-2P)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture. The applications and function of controllers and monitors in modern agricultural systems, including precision agriculture, will be discussed. Fundamental electrical principles and their application to system components will be introduced. Case studies will allow students to study specific components in a control or monitoring system and understand their interrelationships in the overall system.

System diagnostics will be discussed throughout the course.

**AB E 77.6
Workshop Management
2(3L-2P)**

Prerequisite(s): Completion of Year 1 courses of the Diploma in Agriculture program in the College of Agriculture. Provides instruction in selecting the site and planning the resources required for maintenance, repair and improvement of mechanized systems. Basic instruction is provided in arc welding, gas welding and cutting, machine cutting, precision measuring, fasteners, drilling, threading and metal forming. The course also includes a study of shop tools and equipment, including use and supply inventory management. Instruction is provided in the planning and design of metal-based, shop-built projects. Each student will complete and present a class project detailing the planning and equipment selection for a workshop facility.

**AB E 79.6
Water Management
2(3L-2P)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture. Introduction to issues, operational aspects, and regulations of water management as they pertain to prairie agricultural systems. Topics covered include occurrence and control of run-off (erosion and flood control); irrigation systems (requirements and scheduling); drainage of agricultural lands (wetland and salinity control); dryland soil water conservation; water quality maintenance with regard to dugouts, wells, and riparian areas; and government regulations governing water use, pollution and quality maintenance.

Note: Students with credit for Mecag 309.3 may not take AB E 79.6

DEGREE COURSES

**AB E 211.3
Introduction to Biological Systems
1(3L-1.5T)**

An introduction to the biology of cells and tissues, including comparison among organisms. Emphasis is on the physical structures of plants and the physiological processes involved in plant growth. Growth models, the effects of the environment on plant growth and mechanisms of energy exchange with plants and between plants and their environment are studied. An introduction is given to microbiology. The implications of physiological processes for agriculture are examined.

**AB E 212.3
Physical Principles of Plant
Biosystems
2(3L-3P)**

Prerequisite(s): AB E 211. An introduction to physical concepts governing movement and storage of nutrients, energy and water within the plant biosystem (soil-plant-atmosphere). Topics include: physical and mineralogical properties of soil, biogeochemical cycles of macronutrients, plant incorporation of water, nutrients and energy; psychrometrics

as applied to evapotranspiration; and water transport within the soil-plant system. Course material will provide the basis for engineering decisions for optimizing production, harvesting and processing of plant materials.

**AB E 295.3
Introduction to Biosystems
Engineering
2(3L-3T)**

Prerequisite(s): G E 120. Introduction to the discipline of Agricultural and Bioresource (Biosystems) Engineering and to design principles and practices. Students will develop logical problem-solving skills through solution of problems involving energy and mass balances, bioprocessing, instrumentation and machinery systems, water and soil resources and waste management. Extensive use is made of computer software for calculation and graphical presentation of results.

**AB E 311.3
Mathematical Methods
1(3L-1.5T)**

Prerequisite(s): MATH 223 and 224. A study of the application of mathematics to engineering problems involving biological systems. Students will develop proficiency in using the control volume technique to develop models describing mechanical, electrical, fluid and thermal systems. Analytical solutions are derived for commonly encountered ordinary and partial differential equations. An introduction is given to numerical procedures for solution of initial value and boundary value problems.

**AB E 312.3
Electrical Power
1(3L-3P)**

Prerequisite(s): E P 155. Familiarization with electrical distribution systems and utility design within processing plants, and with electrical machines. Topics include DC power, and three-phase and single-phase AC power; electric motors and generators.

**AB E 313.3
Instrumentation
2(3L-3P)**

Prerequisite(s): E P 155. Important characteristics of transducers and circuits used in the measurement of variables such as force, pressure, strain, temperature, humidity and electromagnetic radiation. Introduction to data loggers and digital data acquisition. The course emphasizes the importance of understanding the fundamental principles of transducers and associated circuitry from the standpoint of both design and selection of measurement systems.

**AB E 323.3
Properties of Materials in Biosystems
1(3L-1.5P)**

Prerequisite(s): AB E 211 or 3 credit units Biology. *Corequisite(s): 3 credit units Statistics.* Familiarization with the terminology and definitions of physical properties of biological materials, including size, shape and density; water content, equilibrium moisture content, water activity, capillary

tension, chemical potential and turgidity; chemical and molecular composition; thermal, optical, electrical and magnetic properties. Description of typical measurement methods and equipment for determination of material properties. Students develop an ability to indicate the uncertainty in property measurements and responsibly apply uncertainty in property values to engineering calculations. Emphasis is on describing the importance of biological material properties to engineering systems, and to understanding interactions between living and non-living components of biological systems.

**AB E 324.3
Mechanics of Materials in Biosystems
2(3L-1.5P-1.5T)**

Prerequisite(s): G E 213 and AB E 323.
Analysis of the mechanical properties of biological materials, loads and failure modes. Topics include stress-strain responses for biomaterials in tension, compression and shear, contact stresses, static failure analysis, turgor and micro-mechanical cell models, viscoelastic response, mechanical damage, and friction. Applications relate to separation of plant parts, harvesting, loads imposed on storage structures, tillage and soil compaction, root growth, damage to fruits and seeds during handling, vertebrate locomotion, and rheology of agricultural materials.

**AB E 327.3
Transport Processes in Biosystems
2(3L-1.5P)**

Prerequisite(s): AB E 311; M E 227; CHE 210 or C E 225.

A unified approach to transport of energy and mass in biological and environmental processes. Emphasis is placed on the formulation and solution of mathematical models to represent heat and mass transfer in indoor and outdoor environments, in plant and mammalian systems, and for industrial processing of food and biomaterials. Students will apply analytical and numerical techniques to solve heat transfer problems involving steady state and transient heat conduction, convection and radiation, heat transfer with phase change, and mass transfer problems involving steady state and transient diffusion/dispersion and convection.

**AB E 395.3
Design Capstone I
2(3L-1.5T)**

Prerequisite(s): AB E 295.
Design is presented as both art and science, where solutions are developed using creative design processes that include analysis, synthesis and iterative decision making. Students explicitly define design problems, goals, objectives and constraints, complete an information search, and propose a plan for the analysis and specification of the design solution. A presentation of the design problem and the proposed approach to the design solution will be presented in a seminar to the department.

**AB E 422.3
Modeling of Biosystems
1(3L-1.5T)**

Prerequisite(s): AB E 324 and 327.
The student will be introduced to the concept of computer simulation as an analytical tool for understanding, designing and testing biology-related systems. Content includes introduction to systems modeling, classification of models, elements of dynamic simulation models, analytical models based on equilibrium, modeling growth and population dynamics, compartment models, feedback in biological systems and feedback mechanisms and stability of biological systems. Mathematical optimization and reliability analysis techniques are introduced.

**AB E 431.3
Irrigation System Design
1(3L-1.5P)**

Prerequisite(s): AB E 212 and C E 319.
Engineering and hydrologic principles are applied to design of modern irrigation and drainage systems. Soil-plant-water relationships important to understanding water needs are emphasized.

**AB E 432.3
Soil and Water Conservation
1(3L-1.5P)**

Prerequisite(s): AB E 212 or SL SC 220.
A study of the effects of management practices upon degradation and sustainability of agricultural, forest, wetland, and other land and water resource systems common to the Prairies. Topics include environmental factors governing soil development; degradation including erosion, salinization, soil organic matter depletion, soil compaction, and water contamination; preservation, mitigation and construction of wetlands; water conservation techniques; good agricultural, forestry and land management practices; economic and social-political implications of degradation versus conservation.

**AB E 441.3
Design of Enclosed Environments
2(3L-1.5P)**

Prerequisite(s): Completion of 90 credit units towards the B.E. degree.
This course emphasizes the physical aspects of environment control systems for agricultural buildings. The student will experience engineering designs involving greenhouses, animal shelters and vegetable storages. Emphasis is on solution of real-world problems, which depend upon making reasonable assumptions, integrating knowledge from more than one source, and interpreting mathematical results in terms of physical systems. Some use is made of computer programs. Laboratory periods are used for tours to buildings to observe environment control systems and for work on group design projects.

**AB E 451.3
Design of Agricultural Machinery
Systems
2(3L-1.5P)**

Prerequisite(s): AB E 324.
Study of agricultural and other off-road machinery with special attention to the

functional design requirements of various machine operations, cost analysis, machinery selection and testing. Topics include tillage force analysis, tillage tools, mechanisms for metering and applying seed, fertilizer and pest control chemicals, harvesting methods and machinery, hydraulic and other methods of transmitting power and controlling machines, application of computer aided design and finite element method in design analysis.

**AB E 452.3
Machines in Biosystems: Current
Topics
2(3L-1.5P)**

Prerequisite(s): AB E 313.
Introduction to specialized components and analyses relevant to mechanized systems for production and processing of biological materials. Emphasis is on understanding the function of components within systems. Students will be able to recommend application of these components in a variety of situations and will develop conceptual designs for some of the components.

**AB E 462.3
Agricultural Materials Handling
2(3L-1.5P)**

Prerequisite(s): AB E 323 and 327.
A study of processes involved in conveying, storing, drying, cleaning and sorting agricultural products. Analysis and design of machines used for conveying bulk solids and liquids. Theory and practice of drying for grain and forage crops. Moisture and quality control in storage and transport.

**AB E 481.3
Sustainability and Environmental
Assessment
2(3L-3P)**

Prerequisite(s): Completion of 90 credit units of university study.
A study of the principles of sustainable development and the process of environmental impact assessment with emphasis on Prairie agricultural and industrial settings. Case studies are used to illustrate the EIA process in engineering design of environmental control measures. Concepts of integrated resource management are analyzed as the basis for making linkages between protecting the environment, economic development and public participation.

**AB E 482.3
Design for Waste Utilization
1(3L-1.5P)**

Prerequisite(s): Completion of 90 credit units of university study towards the B.E. degree.
The design of systems and equipment for processing and utilization of wastes generated by the bioresource industries, including primary agriculture, food processing, and forestry. Pollution problems caused by these industries are examined and opportunities for recycling and utilization of wastes are identified. Emphasis is on land as opposed to surface water as a receptor of organic wastes. A comprehensive strategy is developed for approaching pollution control and waste product utilization problems. Students are expected to integrate sociological,

regulatory, economic, biochemical and technological considerations in exploring waste treatment and utilization options. Students will work in teams to conduct an industrial waste survey and a feasibility study of waste reduction and enhanced waste utilization for a specific local industry, farm, or processing plant.

**AB E 495.3
Design Capstone II
2(3P)**

Prerequisite(s): AB E 395.
A continuation of AB E 395 in a self-directed course. Students perform the analysis associated with the design problem and are able to specify a design solution at the end of the course. Students must submit a comprehensive report, describing the design solution. The final design solution is also presented to the faculty and staff in the Department of Agricultural and Bioresource Engineering in the format of poster and oral presentations.

Special Topics

These are courses offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the Dean's Office for further information.

AB E 398.3
AB E 498.3

GRADUATE COURSES

Department of Agricultural and Bioresource Engineering, College of Graduate Studies & Research

**AB E 807.3
Advanced Measurements
2(3L-3P)**

Topics include an analysis of the static and dynamic response of instruments, transducers used for measurement of temperature, pressure, strain, flow, radiation, displacement, velocity, acceleration, information transmission, signal conditioning and recording.

**AB E 809.3
Lubrication
1/2(2L)**

Studies viscosity and flow; hydrostatic and hydrodynamic lubrication; friction and power losses in bearings; bearing materials and lubricants.

**AB E 822.3
Soil Hydrology of Semi-Arid
Environments
1/2(2L-1S)**

Prerequisite(s): Permission of the department.

The hydrological processes of infiltration, evapotranspiration, retention, drainage, and vadose zone flux within the Prairie semi-arid soil system will be studied. The course will cover concepts, field instrumentation and empirical and physically-based methods of analysis. Examples from field investigations will be used as basis for class discussion.

**AB E 825.3
Agricultural Ground Water Hydrology
1/2(3L)**

A study of the fundamental theories and processes governing groundwater

movement, groundwater occurrence and exploration, well construction, and aquifer evaluation. Students actively participate in this class by preparing and presenting a paper on a selected topic.

**AB E 830.3
Design of Farm Irrigation Systems
1/2(3L-3P)**

Detailed study of the design of farm irrigation systems. Land classification and preparation. Theory and empirical methods of estimating consumptive use, hydraulics and economics of sprinkler irrigation design, fundamentals of overland flow applied to the design of surface water distribution systems.

**AB E 840.3
Building Science
1/2(2L)**

The effect of moisture on the properties of agricultural products and building materials with special reference to heat transfer in the unsteady state. Analysis of heat and moisture problems in buildings for cold climates.

**AB E 841.3
Similitude
1/2(2L)**

The application of dimensional analysis and similitude to the analyses of problems in Agricultural Engineering.

**AB E 850.3
Post-harvest Technology
1/2(3L)**

Engineering principles as applied to processing of various agricultural materials. Topics include thermal environment, transfer processes, and physical properties of agricultural materials. The emphasis will be on handling, storage, and drying of agriculture grains and their products.

**AB E 860.3
Parameter Estimation in Engineering
1/2(3L)**

Prerequisite(s): Permission of the instructor. Methods of data analysis and estimation of parameters appearing in mathematical models. Topics include parameters and model identification, sensitivity analysis, ordinary least squares, maximum likelihood, maximum a posteriori and sequential procedures. Methods of optimal experimental design in engineering applications are also reviewed.

**A E 861.3
Soil-Machine Relations in Tillage
and Traction
1/2(3S-1.5P)**

Prerequisite(s): A university-level course in calculus.

Mechanics of interactions between agricultural and forest soils and tillage and traction devices. Determination of relevant soil physical parameters. Analysis of stress and strains in soil due to machine applied loads. Effects on plant growth. Experimental and analytical methods for synthesizing characteristics of overall systems.

**AB E 872.3
Applied Stereology
1/2(2L-3P)**

Prerequisite(s): A university-level course in statistics.

Stereology is a series of efficient and unbiased methods to obtain information

regarding 3-D structure from 2-D sections. Focuses on practical stereological methods for obtaining unbiased estimates of surface area, volume, connectivity of porous structures, number of objects, and spatial distribution of objects, using properly sampled information. The focus will be on stereology for non-homogenous materials.

**AB E 898.3
Special Topics
1/2(R)**

Special problem assignments involving investigation and/or design in each of the major study areas of agricultural engineering. Each student's work will be limited to his/her own area of specialization. A technical report in a form satisfactory to the supervisor is required.

**AB E 990
Seminar**

Graduate students are required to register, to attend and to participate in the seminar course throughout their program.

**AB E 992.3
Project**

Students undertaking the Project Master's degree (M.Eng.) must register in this course. It consists of independent study and investigation of a real world problem, and submission of an acceptable report on the investigation.

**AB E 994
Research**

Students writing a Master's thesis must register for this course.

**AB E 996
Research**

Students writing a Ph.D. thesis must register for this course.

AGRICULTURAL ECONOMICS

Department of Agricultural Economics,
College of Agriculture

DIPLOMA COURSES

**AG EC 42.6
Financial Accounting
1(3L)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture

This course provides an introduction to the concepts and principles of accounting and an understanding of the process by which financial information is accumulated and reported in a financial statement format. Accounting for operating activities, investing and financial activities is emphasized for sole proprietorships, partnerships and corporations. Students will be exposed to accounting software programs and the proper procedures to follow in the general implementation or conversion of these computerized systems.

**AG EC 52.6
Economics
2(3L)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture

This course will introduce students to economics as a way to understand

production and consumption as interrelated parts of the agriculture sector. Basic demand and supply will be used to explain how prices are determined and how incomes are influenced by increasing world population and increasing productivity in agriculture. Decisions faced by individual producers and consumers will be examined. The structure and characteristics of the national economy and the monetary system will be presented, to show how the agriculture sector fits into the Canadian and world economic systems. For every topic, applications and relevance to agriculture will be emphasized.

**AG EC 54.6
Introduction to Law and the Taxation
of Individuals
2(3L)**

Prerequisite(s): AG EC 42.6 and enrolled in the Diploma in Agriculture program in the College of Agriculture

Introduces students to the taxation of individuals and the general principles of law. The area of tax will concentrate on personal income tax and tax planning considerations, while the legal area will cover civil actions, private and civil wrongs, contracts, commercial and consumer protection, debt/creditor relationships, and real property and family law.

**AG EC 62.6
Financial Management
1(3L)**

Prerequisite(s): AG EC 42.6, 52.6, and enrolled in the Diploma in Agriculture program in the College of Agriculture

An introduction to management, including goal formulation, decision analysis, and problem analysis. Analysis of financial statements (ratio and trend analysis) and credit management will be discussed. Budgeting will be used to project business enterprise returns and diversification options. Time value of money and financial management of investments will be studied. Practical applications will be made to the agriculture industry.

**AG EC 66.6
Introduction to Agricultural
Marketing
1(3L)**

Prerequisite(s): AG EC 52.6 and enrolled in the Diploma in Agriculture program in the College of Agriculture

Examination of the western Canadian grain and livestock marketing systems – structure, organization, operation, procedures, institutions and agencies. The price discovery methods used in grain and livestock marketing, including open marketing and marketing boards, are also investigated. Other topics include the historical evolution of current marketing systems, marketing functions, fundamental and technical analysis, and use of marketing information. Policy issues and regulation and their relationship to market structure are discussed, together with a description and analysis of Canada's position in international grain markets and the transportation system.

**AG EC 71.3
Crops Marketing
2(3L)**

Prerequisite(s): AG EC 66.6 and enrolled in

the Diploma in Agriculture program in the College of Agriculture

This course focuses on marketing management as a principal activity in the farm business applied to grain, oilseed, pulse and specialty crops, including herbs and spices. A central point is the development of a marketing plan for an agricultural business. Marketing and risk management strategies are incorporated into farm management decisions in order to understand the implications associated with each. Skills and strategies are developed which can be used as marketing tools in various agricultural enterprises. Pricing and delivery alternatives and strategies are examined, including futures, options, charting and contracting.

**AG EC 72.6
Principles of Selling
2(3L)**

Prerequisite(s): AG EC 52.6 and AGRIC 61.3 or 62.3 and enrolled in the Diploma in Agriculture program in the College of Agriculture

In this course students are introduced to the principles of salesmanship and their application to agricultural business. Emphasis will be placed on the application of principles to real-world situations and on building selling skills through class projects. Students will learn tactical selling skills, develop self-management skills, and study strategic selling techniques. Policies (current and impending) and regulations governing salesmanship are discussed.

**AG EC 73.3
Livestock Marketing
2(3L)**

Prerequisite(s): AG EC 66.6 or permission of the instructor and enrolled in the Diploma in Agriculture program in the College of Agriculture

This course is designed to foster an understanding of livestock marketing. The applied skills which are necessary tools for the modern agricultural producer will be developed, with a focus on marketing management as a principal activity in the farm business applied to beef, pork, supply-managed commodities, and non-traditional livestock. A central point is the development of a marketing plan for an agricultural business. Marketing and risk management strategies are incorporated into farm management decisions in order to understand the implications associated with each. Skills and strategies are developed which can be used as marketing tools in various agricultural enterprises. Pricing and delivery alternatives and strategies are examined, including futures, options, charting and contracting.

**AG EC 74.6
Agribusiness Marketing
2(3L)**

Prerequisite(s): AG EC 52.6 and enrolled in the Diploma in Agriculture program in the College of Agriculture

Agribusiness includes all activities involved in bringing food and fibre to the final consumer. Agribusiness marketing involves marketing activities in the input sector, the agricultural production sector, and the processing/manufacturing sector – essentially to the point that a purchase is

made by the final consumer of the good or service. Agribusiness marketing also encompasses issues of trade in food and fibre products. This course will focus on the importance of effective marketing management to the success of an agribusiness firm. Students will be introduced to the marketing management practices of successful agribusiness firms. The selection of target markets and the development of the marketing mix will be emphasized.

AG EC 75.6 **Agricultural Business Capstone** **2(3L)**

Prerequisite(s): AG EC 42.6, 52.6 and 62.6; AGRIC 61.3 or 62.3, and enrolled in the Diploma in Agriculture program in the College of Agriculture

This course will assist students to develop and integrate the knowledge and skills required to prepare and present a business plan for an agribusiness entity. Students will work in teams and the course will stress the importance of team collaboration.

AG EC 76.6 **Agricultural Policy** **2(3L)**

Prerequisite(s): AG EC 52.6 and enrolled in the Diploma in Agriculture program in the College of Agriculture

This course begins with an examination of why government policy is important to the agricultural industry and why governments at all levels become involved. Areas of policy are examined, with emphasis on policies which affect the holding and operation of farm land and those which affect the transportation and handling of grain crops. A detailed examination is made of several provincial government policies as they affect the farm operator in Saskatchewan.

AG EC 78.6 **Management Accounting** **2(3L)**

Prerequisite(s): AG EC 42.6 and 62.6 and enrolled in the Diploma in Agriculture program in the College of Agriculture

Introduces students to management accounting concepts and principles. The course will concentrate on cost concepts, the design of cost accounting systems, cost allocation and the role of management accounting in the internal decision-making process of an organization.

AG EC 81.3 **Agribusiness Experience** **A summer course taken between** **Years 1 and 2.**

Prerequisite(s): Completion of Year 1 courses in the Diploma in Agriculture program in the College of Agriculture

This course will begin the process of enabling students to articulate and document the required competencies for entry-level agribusiness management positions. Students will be required to participate in in-class discussions and to undertake a 13-16 week supervised work term. They will be required to apply, be interviewed, and work for an employer within the agribusiness industry. For the work term to qualify as a *bona fide* experience students will not be allowed to

work for a family member or close neighbour.

AG EC 88.3 and 89.6 **Special Topics**

These courses are offered occasionally in special situations, to students enrolled in the Diploma in Agriculture program. Interested students should contact the Department of Agricultural Economics for more information.

DEGREE COURSES

AG EC 261.3 **Research Methods in Agricultural** **Economics** **1(3L-2P)**

An introduction to research methods in agricultural economics, and a survey of the various quantitative and qualitative tools commonly used in agricultural economics. Includes an introduction to economic data and the use of computers in data collection, included will be an introduction to sampling, survey design, and basic statistical inference. Data manipulation and methods for describing and displaying data will be covered. Course content will emphasize the computer skills necessary for advanced agricultural economics courses.

AG EC 272.3 **Introduction to Agricultural** **Economics** **2(3L-2P)**

Prerequisite(s): AG EC 261 (or 262); ECON 211.

Demonstrates the practical application of the economic theory and technique developed in previous courses. On-going and published research is used to teach the step by step process of using economic theory to understand and analyze issues with which the discipline concerns itself. In addition, current issues and policies are selected to guide students through the process of translating an economic problem into a researchable question. Students will participate by defining their own research questions, selecting the appropriate theoretical framework, finding data appropriate to conducting an analysis, doing a simple empirical analysis, summarizing results and discussing implications of their research in the form of a paper.

AG EC 292.3 **Economics of Biotechnology** **1(3L)**

Prerequisite(s): Completion of 30 credit units of University level courses.

Advances in scientific knowledge and technology are transforming the nature of economic growth and giving rise to new industries. This course examines the nature and organization of the biotechnology industry from the perspective of policy and economics. The primary focus will be on the agri-food system.

AG EC 302.3 **Intermediate Agricultural Economics** **1(3L)**

Prerequisite(s): ECON 111.

This course covers the principles of economics and their application to optimal resource allocation in agriculture. The first part of the course will cover topics in

production economics, pricing and market structure. The second part will examine the theory of consumer demand and utility.

Note: Agricultural Economics students will not be allowed to take this course for credit. Only one of AG EC 302.3, ECON 211.3 and ECON 213.3 can be taken for B.S.A. credit.

AG EC 315.3 (Formerly 310) **Application of Microeconomic Theory** **to Agriculture** **1(3L-2P)**

Prerequisite(s): ECON 211; MATH 110 and MATH 112 or 116 or 213 or 264 or ECON 305 or 306.

A calculus treatment of microeconomic theory as it applies to optimal resource allocation in agriculture, individual consumer choice, and the behaviour of competitive markets.

AG EC 320.3 **Introduction to Farm Business** **Management** **1(3L-2P)**

Prerequisite(s): AG EC 302 or COMM 101 or ECON 211.

The analysis and interpretation of basic farm accounting records and the use of this information in planning future farm decisions. Skills taught will include an analysis of financial statements, including ratio and trend analysis and projecting future farm business plans using budgeting and computerized tools.

Note: Agricultural Economics students will not be allowed to take this course for credit.

AG EC 322.3 **Farm Business Management** **2(3L-2P)**

Prerequisite(s): ECON 211; COMM 201; COMM 203 and 200 or 204.

Analysis of farm business financial statements using ratio and trend analysis. Forward planning using capital budgeting and risk analysis techniques. Case studies will be used throughout the course.

AG EC 330.3 (Formerly 430) **Land Resource Economics** **1(3L)**

Prerequisite(s): AG EC 302 or ECON 211 or 213.

A study of natural resource economics with emphasis on environmental economics, measurement of non-market goods, project evaluation, issues in urban and rural land use, and conservation. Policy problems related to the foregoing will be examined.

AG EC 342.3 **Industrial Organization of Agricultural** **Markets (Formerly 340)** **2(3L-2P)**

Prerequisite(s): AG EC 315; or permission of the instructor.

Describes the current structure of agriculture and changes currently taking place. Theoretical concepts such as oligopoly models, game theory, and transactions costs theory are developed. These theories are used to examine such issues as market concentration, spatial competition, vertical integration, contracting, and agricultural research and development.

AG EC 343.3 **Grain and Livestock Marketing** **2(3L)**

A study of the Canadian grain and livestock marketing systems, procedures and institutions. Examines the price discovery methods used in grains and livestock marketing including: open (futures) market, marketing boards, teletype auctions, etc. Other topics include: the historical evolution of current marketing systems, marketing functions, government policy and regulation and market structure.

AG EC 361.3 (Formerly 362) **Intermediate Statistical Analysis** **1(3L-2P)**

Prerequisite(s): AG EC 261; STATS 245; or equivalent.

Focuses on analysis of agricultural management and marketing issues using statistical methods. Topics include: data collection, estimation, and test of hypotheses in regression analysis; use of binary variables and non-linear regression.

AG EC 420.3 **Farm and Agricultural Business** **Operations Management** **1(3L-2P)**

Prerequisite(s): AG EC 322 or equivalent.

An introduction to the theory and practice of operations and financial management under risk and uncertainty. This consists of an examination of techniques and procedures which can be used by the manager and by the professional acting as consultant to the manager. Techniques reviewed include total farm budgeting, linear and quadratic programming and decision analysis.

AG EC 432.3 **Rural Development: Theory, Policy** **and Case Studies** **2(3L)**

Prerequisite(s): ECON 211 and 214.

Focuses on the theories of rural development, a review of the rural development policies of federal and provincial governments and an analysis of various rural development projects. Comparisons are made at appropriate points between Canadian and U.S. policies and development programs.

AG EC 433.3 **Methods of Rural Analysis: Theory** **and Application** **2(3L)**

Prerequisite(s): ECON 211 and 214.

The methods used in the analysis of rural economies, with particular emphasis on economic impact analyses, will be examined. Case studies utilizing these techniques will be reviewed and analyzed.

AG EC 434.3 **Economic Methods of Project** **Analysis** **2(3L)**

Prerequisite(s): AG EC 302 or 315 (or 310), and ECON 214; or permission of the instructor.

Examines and illustrates various techniques to analyze the economics of an investment project. Techniques covered include: benefit-cost analysis, input-output based impact analysis, computable general equilibrium models, and methods to deal

with linkages between environment and development. Project analysis from a sustainable development perspective and multiple criteria methods for planning of projects are also included.

**AG EC 435.3
Agricultural Finance and Appraisal
2(3L-2P)**

Prerequisite(s): AG EC 420 or COMM 203.
Study and application of economic principles in agricultural finance and capital investments analysis and farm real estate appraisal. Farm finance includes the study of financial management and agricultural credit. Farm appraisal includes a study of land values and the various approaches to the valuation and assessment of farm real estate.

**AG EC 440.3
Agricultural Marketing Systems
2(3L)**

Prerequisite(s): AG EC 315 (or 310) and 342 (or 340); or permission of the instructor.

Provides an understanding of how prices are discovered under alternative marketing systems in the Canadian agriculture and food industries. Price discovery mechanisms under open and regulated markets are examined including buyer-seller negotiations, futures and options, auctions and use of formulas and contracting. The performance of alternative systems is examined. The course introduces the additional subjects of information theory, institutional economics and contracting.

**AG EC 451.3
Agricultural Problems and Policies
1(3L)**

Prerequisite(s): AG EC 315 (or 310).
A review of the scope and character of problems affecting Western Canadian agriculture, and a study of the policies and legislation bearing on those problems. Students will be assigned special references for review and discussion and will complete a term assignment on a special phase of the course. Special emphasis is given to student participation.

**AG EC 461.3
Agricultural Commodity Analysis
2(3L-2P)**

Prerequisite(s): AG EC 361; or equivalent.
Deals with two basic approaches to analysis of agricultural commodities, including variables such as prices, outputs and sales. The first approach focuses on the causal relationships among economic variables, and the topics include supply-disposition analysis, regression analysis, and an introduction to econometric modeling. The second approach focuses on the time series characteristic of an economic variable and the topics include trend extrapolation, exponential smoothing and Box-Jenkins analysis.

SPECIAL TOPICS

These courses are offered occasionally in special situations. Students interested in such opportunities should contact the department for information on offerings.

AG EC 498.3

GRADUATE COURSES

Department of Agricultural Economics,
College of Graduate Studies & Research

**AG EC 820.3
Agricultural Production Economics
2(3L)**

Prerequisite(s): Permission of the instructor.
A study of the application of production economic principles with special attention to the usefulness of recent dynamic and stochastic production theory/model developments. Production economics principals are applied to both micro and macro economic problems.

**AG EC 832.3
Rural Development
2(3L)**

Prerequisite(s): Graduate-level standing.
The study of theories of rural development in advanced-market economies, a review of empirical studies of selected North American rural economies and a survey of national and subnational North American rural development policies.

**AG EC 835.3
Welfare Economic Applications in
Agricultural Policy
1/2(3L)**

Prerequisite(s): AG EC 315 (or 310) or equivalent; AG EC 342 (or 340) or equivalent.
Corequisite(s): AG EC 820 or ECON 800.
Introduction to the fundamentals of applied welfare economics, with particular emphasis on the application of welfare economics to the analysis of agricultural problems. Techniques for measuring social costs and benefits are discussed. Focus is on agricultural policy the implications on the economy.

Students interested in a specialization in agricultural marketing should take both AG EC 840 and 842.

**AG EC 840.3
Methods of Marketing Agricultural
Products
1(3L)**

Prerequisite(s): Permission of the instructor.
A study of alternative marketing systems and price discovery methods from the point of view of the agricultural economist as a researcher. Covers the relevant literature with a focus on the theoretical and research issues of market regulation (rent seeking), commodity futures markets, auction markets, marketing boards, thin markets, vertical integration and coordination. A special section is included on international marketing and marketing in developing economies.

**AG EC 842.3
Agricultural Market Organizations
2(3L)**

Prerequisite(s): Permission of the instructor.
Develops a conceptual framework in which organizations, their behaviour, their interactions with other firms and their impact on an industry can be studied, compared and analyzed. The relevant literature in organizational theory, industrial organization and contract theory is

reviewed, especially as it focuses on theoretical and empirical work in the areas of co-operatives, crown corporations and other forms of organizations. Examination of these types of firms is undertaken to better understand their behaviour and to develop concepts that can be put to use in analyzing other types of organizations.

**AG EC 845.3
Transportation Economics and
Interregional Competition
1(3L)**

Prerequisite(s): Permission of the instructor.
Deals primarily with the transportation economics as applicable to the transportation problems of agricultural commodities. Topics include a study of basic concepts in transportation economics, decision making in space, and an evaluation of spatial equilibrium and interregional competition models.

**AG EC 851.3
Agricultural Policy
2(3L)**

Prerequisite(s): Permission of the instructor.
Focuses on an economic analysis of agricultural policies in Canada. In addition, general economic policy will be discussed in terms of how it impacts on farm income, economic growth and efficiency. Agricultural policies in other countries will also be discussed.

**AG EC 855.3
International Agricultural Trade
Policy
1(3L)**

Prerequisite(s): Graduate-level standing in agricultural economics or economics.
The economic analysis of agricultural trade policy. Topics include introduction to international trade theory, an introduction to trade policy, methods of protection by importers and methods of protection by exporters.

**AG EC 860.3
Econometrics for Agricultural
Economists I
1(3L)**

Prerequisite(s): AG EC 461; or equivalent.
Deals with the alternative methods of estimating economic relationships. Topics include a review of single-variable statistical inference, the two-variable regression model, violations of the basic assumptions of ordinary least squares regression, the multiple-variable regression model, and models that use qualitative variables.

**AG EC 861.3
Econometrics For Agricultural
Economists II
2(3L)**

Prerequisite(s): AG EC 860.
Follows up on concepts developed in AG EC 860, more appropriate to research in Agricultural Economics. Topics include multi-variate hypothesis, extensions of multiple regression, distributed lag models, problems of estimation, and simultaneous equation methods. Econometric model building, including evaluation, forecasting, and econometric simulation will also be included.

**AG EC 862.3
Advanced Econometrics
2(3L)**

Prerequisite(s): AG EC 861; or equivalent.
A study of advanced concepts in econometric theory and foundations, building it up from AG EC 861. Topics include inference and distribution theory including asymptotic distributions, statistical analysis of disturbances and generalized least squares, aggregation, non-linear estimation, Bayesian methods, and control theory.

**AG EC 866.3
Mathematical Programming
Applications for Agriculture and Agri-
business
2(3L)**

Prerequisite(s): AG EC 315 (or 310); or equivalent.
Concerned with the application of mathematical programming models for solving farm management, resource economics, international trade and policy problems. Besides a review of general linear programming principles, the course will deal with duality theory, sensitivity analysis, non-linear and quadratic programming and risk programming. Extensive use of linear and non-linear programming computer programs will be used for class assignments.

**AG EC 890.3
Research Procedures in Agricultural
Economics
1(3L)**

Prerequisite(s): Permission of the instructor.
Topics from the areas of the philosophical basis of research in Agricultural Economics, the methods of science as applied to economic problems, current issues and problematic aspects of both the methods and substance of research in Agricultural Economics and initiating, organizing, funding and utilizing the results from research are examined.

**AG EC 898.3
Special Topics
1/2(3L)**

Reading essays and discussion in an approved special field.

**AG EC 990
Seminar**

Reports and discussion on current development and research. All graduate students in Agricultural Economics are required to register. Attendance and at least one paper required of postgraduate students during the period of their candidacy, whether for one year or more.

**AG EC 992.6
Project**

Students undertaking the project Master's degree (M.Agr.) must complete the course as part of the requirements for the degree.

**AG EC 994
Research**

Students writing a Master's thesis must register as in the case of regular courses.

**AG EC 996
Research**

Students writing a Ph.D. thesis must register for this course.

COURSES • Agriculture

AGRICULTURE

College of Agriculture

DIPLOMA COURSES

AGRIC 40.3 Introduction to Communication 1(2L-2P)

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture
Provides instruction and practice in written and oral communication. Topics include developing a thesis, writing essays, letters, reports and résumés, and delivering demonstrative, social, impromptu, informative, and persuasive speeches. Assignments emphasize language usage, organization, information gathering, expression and, in oral communications, poise and projection. Students are encouraged to incorporate a discussion of agricultural issues, trends and ethics into both oral and written communications.

AGRIC 45.3 Computer Applications 1(2P)

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture
An introduction to microcomputer hardware and software currently in use within the Diploma in Agriculture program. Emphasis will be placed on learning how to use the hardware, developing some skills in word processing, and understanding the basic functioning of a spreadsheet program; the use of a database program and an accounting program will also be introduced.

AGRIC 60.3 Professional Communication 1(3L-2P)

Prerequisite(s): AGRIC 40.3 and enrolled in the Diploma in Agriculture program in the College of Agriculture
Enhances communication skills for a business/professional context, including the proper conduct of meetings, the drafting of motions, proposals and briefs, and the process of building consensus. The course studies group dynamics, particularly in oral communications. Students participate in panel discussions and debates, strategy sessions and media relations, and consider ways in which decisions are made and implemented.

AGRIC 61.3 Leadership and the Community 1(3L)

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture
This course is designed to introduce students to concepts of leadership in a practical and applied manner. In addition, the course will provide some insight into the various factors which are at work in the community and which influence the way in which the community functions. Past and current Canadian leaders will be examined. Government policies, lobby groups and the media will be studied, and the way in which effective leaders can respond in the

interests of the agricultural industry will be addressed.

AGRIC 62.3 Human Resource Management 1(3L-1T)

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture
This course provides an opportunity to study issues related to human resource management in the agriculture industry in western Canada. Emphasis will be placed on understanding human resource management theory and practice. Topics addressed include the managerial role, management theory, group work behaviour, and leadership. More practical applications, such as motivation, staffing, performance appraisal, stress and time management, and interpersonal relations, receive considerable attention.

DEGREE COURSES

AGRIC 111.3 Agricultural Science I 1(3L-2P)

An introduction to agricultural systems illustrating the interactions between plant, animal, microbial, human and environment components. The soil/plant/environment interface is emphasized. Management decisions affecting cropping and land use are examined.

AGRIC 112.3 Agricultural Science II 2(3L-2P)

An introduction to agricultural systems and the interactions between microbial plant, animal, and human components. The emphasis is on issues and problems associated with animal production, value-added processing, marketing and the consumption of food.

AGRIC 201.3 Agricultural Systems 2(3L)

Prerequisite(s): AGRIC 111 and 112; or written permission of the Dean.
The nature of agricultural systems in Western Canada and throughout the world is explored through an examination of the physical, economic and social components of agricultural systems and their interactions. Emphasis is placed on understanding the functioning of agricultural systems, including why different agricultural systems have evolved and will continue to evolve in the face of change. Production, environmental, and socio-economic issues specific to different systems are discussed.

AGRIC 210.3 Environmental Physics 2(3L-3P)

Measurement and analysis of interactions between organisms or biomaterials and their physical environment. Transport and storage processes of matter and energy occurring within natural and human-modified agricultural environments will be studied. Lectures will cover concepts and applications while seminars and practicums will cover instrumentation and simulation.

AGRIC 222.3 Intellectual and Social Foundations of Modern Agriculture 2(3L)

Examines the role of scientific ideas, rational planning, industrialization, trade, the state, and ecology in shaping the structure of modern agriculture and the social-political environment within which it operates. Students will explore mainly European and North American history over the last 300 years to find the social, political, and economic conditions that have brought about the present situation in agriculture and which hold clues to options for the future.

AGRIC 290.3 Microcomputers in Agriculture 1/2(3L-6T)

An introduction to microcomputer hardware and software currently in use within the College of Agriculture. Software skills necessary in advanced agricultural courses will be covered. Course content and format will reflect the microcomputer systems utilized in the college.

AGRIC 291.3 Oral and Written Communications 1(1L-2P)

Provides instruction and practice in technical and professional writing and oral communication. Topics include preparation of a resume, memorandum, technical and business correspondence, formal and informal reports, speech organization, delivery, impromptu talks, group discussion methods, parliamentary procedures and use of audio-visual aids.

AGRIC 485.3 Environmental Science Capstone Course 2(1L-2P)

Prerequisite(s): Fourth year B.S.A. Environmental Science Major.
A project based course investigating global and local environmental issues. Students will investigate and synthesize information on topical environmental problems and present the results in class. The primary source of information will be the WWW so that skills involving the selection, acquisition, filtering and presentation of data together with critical thinking will be stressed. Concepts of system modelling will be introduced using Stella software.

AGRIC 492.3 Term Paper and Technical Writing 1&2

Prerequisite(s): For Agricultural Economics students: AG EC 315 (or 310), 342 (or 340) and 361 (or 362). Other students are asked to consult a program advisor in their area of specialization.

The first portion of the course is composed of lectures on writing to be given in the first seven meetings. In the second portion of the course the student will select a topic and be assigned to a professor for supervision. An acceptable typed copy of the term paper must be presented to the department.

AGRIC 493.3 Team Project in Agricultural Science 1&2

Prerequisite(s): Successful completion of 75 credit units towards the B.S.A. degree before registration.

Students will be assigned to small, interdisciplinary groups to address a current problem in agriculture. They will work closely with one or more faculty members or professionals in the private or public sectors to prepare a comprehensive written report. A final oral report may be required.

AGRIC 494.6 Research and Thesis 1&2

Prerequisite(s): Registered B.S.A. Honours students or special permission of a supervising department and a minimum cumulative weighted average of 70% or higher. For Agricultural Economics students, AG EC 315 (or 310), 342 (or 340) and 361 (or 362) are required.

A project is selected, in consultation with a faculty supervisor, which will provide an opportunity for the student to gain experience in literature review, collection, analysis and interpretation of primary or secondary data. The project results will be presented to the supervising department in the form of a bound thesis. In some departments a seminar presentation is required.

SPECIAL TOPICS

These courses are offered occasionally in special situations. Students interested in such opportunities should contact the Department for information on offerings.

AGRIC 498.3

CO-OPERATIVE EDUCATION

AGRIC 170.0 Work Experience 1

Prerequisite(s): Acceptance into the program.

AGRIC 270.0 Work Experience 2

Prerequisite(s): AGRIC 170.

AGRIC 370.0 Work Experience 3

Prerequisite(s): AGRIC 270.

AGRIC 470.0 Work Experience 4

Prerequisite(s): AGRIC 370.

AGRIC 570.0 Work Experience 5

Prerequisite(s): AGRIC 470.

AGRONOMY

College of Agriculture

DIPLOMA COURSES

AGRON 75.6 Advances in Agronomy 2(3L)

Prerequisite(s): PL SC 41.6; SL SC 41.6, 52.6, and enrolled in the Diploma in Agriculture program in the College of Agriculture.

This course provides a forum to investigate current agronomic issues of importance to western Canada. Students acquire information about these issues through invited presentations by recognized experts, independent research and team problem solving. They are encouraged to investigate each issue in a multidisciplinary manner

and communicate their findings in both oral and written form.

**AGRON 82.3
Field Diagnostic School**

Prerequisite(s): PL SC 41.6; SL SC 51.6, 52.6, and enrolled in the Diploma in Agriculture program in the College of Agriculture

The Field Diagnostic School provides students with practical experience in recognizing and diagnosing various soil and crop production problems. By examining a range of demonstration and research plots, students will be exposed to a wide variety of agronomic practices and problems including weed control and herbicide damage, nutrient deficiencies, fertilizer application and damage, seeding practices and pest management. A local tour of soils will be used to illustrate differences in parent material and soil development. A final project will be completed by correspondence.

Note: Conducted during a three-day period in July between Years 1 and 2. A special fee will apply.

ANATOMY

Department of Anatomy and Cell Biology, College of Medicine

For details on the B.Sc. in Anatomy see the College of Arts & Science section.

**ANAT 200.3
Introduction to Cell Biology
1/2(3L-3P)**

Prerequisite(s): BIOL 110 and BIOCH 200 to be taken concurrently.

Deals with important structural and functional characteristics of cells as applied to diverse cell types in eukaryotic organisms. Laboratories consist of demonstrations, movies, computer-assisted learning, and study sessions on specific topics, and emphasize cellular structure, ultrastructure, cytogenetics, and microscopic techniques as applied to cell biology.

**ANAT 210.3
Basic Human Anatomy
1/2(3L-3P)**

Prerequisite(s): BIOL 110.

The anatomical organization of the human body will be examined from systemic and functional bases. The histological organization of tissues and organs as well as the evolution and embryonic development of the human body will be considered wherever these shed light upon the organization of the human body.

Note: Students with credit for ANAT 202 cannot take ANAT 210 for credit.

**ANAT 215.6
Basic and Applied Human Anatomy
1&2(3L-3P)**

Prerequisite(s): BIOL 110. Restricted to students enrolled in the School of Physical Therapy.

Primarily for students of Physical Therapy. Includes basic gross anatomy of the human body supplemented with essential elements of cell biology, histology and organ development. Emphasis is given to the musculo-skeletal system with all aspects of

function and application to the need of physical therapists.

**ANAT 221.3
Gross Anatomy
1/2(3L-P)**

Prerequisite(s): BIOL 110. Restricted to students enrolled in the College of Kinesiology.

Especially designed for students in Kinesiology with applications to activities involving motion, locomotion and related injuries. The emphasis is on the structural, biomechanical and positional relationships of the skeleton, joints, muscles, blood vessels and peripheral nerves in the trunk and limbs.

**ANAT 232.6
Cell Biology and Histology
1&2 PA**

Restricted to students enrolled in the College of Medicine and the College of Dentistry.

An introduction to cell biology from a medical perspective followed by a survey of tissue organization and systematic study of the normal arrangement of cells and tissues into organs and organ systems.

**ANAT 233.3
Embryology and Gross Anatomy
1(6L/P)**

Restricted to students enrolled in the College of Dentistry.

Embryology and an introduction to systemic anatomy will be covered, and a detailed study of the gross anatomy of the head, neck and thorax will be undertaken by regional dissection.

**ANAT 234.3
Introductory Neuroanatomy
2 PA**

Prerequisite(s): For Arts and Science students only: ANAT 202 or equivalent and permission of the department. Restricted to students enrolled in the College of Dentistry, College of Medicine or School of Physical Therapy.

An introduction to the anatomy of the human brain and spinal cord through lectures, laboratory dissections, and clinical correlation tutorials.

**ANAT 235.9
Gross Anatomy and Embryology
1&2 PA**

Restricted to students enrolled in the College of Medicine.

Introduction to the basic human body plan, including a detailed study by regional dissections and related studies of human embryology, radiological and clinical anatomy.

**ANAT 325.3
Advanced Cell Biology
1/2(3L)**

Prerequisite(s): ANAT 200.

Recent concepts in the regulation of cell growth, development and function are considered. Topics covered include regulation of gene expression, synthesis and processing of RNA and protein, cell cycle regulation, and cellular signaling mechanisms. Emphasis is placed on how these processes are regulated and how they

in turn combine to regulate overall cellular activities.

Note: Students with credit for ANAT 300 cannot take ANAT 325 for credit.

**ANAT 330.3
Principles of Development
1/2(3L)**

Prerequisite(s): ANAT 200 and either ANAT 210 or BIOL 203.

An introduction to the cellular and molecular mechanisms regulating embryonic development in animals, including vertebrate and invertebrate species. In addition, topics of metamorphosis and regeneration will be briefly discussed.

Note: Students with credit for ANAT 201 cannot take ANAT 330 for credit.

**ANAT 331.3
Methods in Cell and Developmental Biology
1/2(3P)**

Prerequisite(s): ANAT 200, BIOCH 212, and permission of the Department.

This course will provide laboratory experience in cell and developmental biology. Instruction on, and use of, techniques such as cell culture, expression of proteins in cells, basic cytology, and immunofluorescence will be some of the areas covered.

**ANAT 334.3
Introductory Neuroanatomy
2 PA**

Prerequisite(s): ANAT 202 or equivalent and permission of the department.

Restricted to students enrolled in the College of Arts & Science.

An introduction to the anatomy of the human brain and spinal cord through lectures, laboratory dissections, and clinical correlation tutorials.

Note: Students with credit for ANAT 234 cannot take ANAT 334 for credit.

**ANAT 401.6
Undergraduate Research Project
1&2(6P)**

Prerequisite(s): Permission of the Department.

A course to provide experience in experimental techniques and approaches to cell biology problems. The student will be supervised by a faculty member who must be identified before registration. Preference is given to 4th year students in Anatomy. Evaluation is based on oral presentations, written papers, and industry. This course is not open to students in the Honours program.

**ANAT 402.6
Honours Research Project
1&2(6P)**

Prerequisite(s): Permission of the Department.

A course providing experience in experimental design and methodology, and familiarity with the scientific literature in the area of research. The student will work on a laboratory project supervised by a faculty member. Evaluation will be based on oral presentations, written thesis, and defense of the thesis findings.

**ANAT 404.3
Cellular Neurobiology
1/2(2L-3P)**

Prerequisite(s): PHSIO 336 and either ANAT 325 or PHSIO 337.

The cell biology of neurons and glial cells will be studied, with detailed discussion of synaptic signaling and sensory transduction, as well as the function of glial cells in maintaining the neural signaling machinery.

Note: Students with credit for ANAT 403 cannot take ANAT 404 for credit.

**ANAT 405.3
Current Topics in Cell Biology
1/2(3S)**

Prerequisite(s): ANAT 325, 330, 331, or permission of the Department.

Recent developments and the state of the art of cell biology research will be examined in a seminar-discussion format. Students will present and evaluate selected publications from the current literature on a variety of topics related to cell biology.

**ANAT 490.0
Seminar
1&2 (1S)**

Honours students in Anatomy are required to attend departmental seminars throughout the program.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

ANAT 398.3 1/2(3S)

ANAT 399.6 1&2(3S)

ANAT 498.3 1/2(3S)

ANAT 499.6 1&2(3S)

GRADUATE COURSES

Department of Anatomy, College of Graduate Studies & Research

**ANAT 732.3
Human Histology
1/2(2L&2P)**

Prerequisite(s): ANAT 200; or equivalent cell biology course.

A survey of human tissue organization and systematic study of the normal arrangement of cells and tissues into organs and organ systems.

**ANAT 801.6
Human Gross Anatomy
1&2(2L-6P-1S)**

Prerequisite(s): ANAT 202; or equivalent.

A practical study of the macroscopic structure of the human body by regional dissection and study of prepared specimens. Lectures are closely integrated with the laboratory sessions. Correlation of structure and function is emphasized and surface and radiological anatomy are included.

**ANAT 802.3
Advanced Cytogenetic Techniques
1/2(1L-6P)**

Prerequisite(s): BIOL 211 and ANAT 812; permission of instructor.

This laboratory course will familiarize the students with a variety of modern

cytogenetic techniques. The exercises involve tissue culture techniques and cell preparation for chromosome analysis, chromosome banding, demonstration of nucleolar organizers, differential staining of sister chromatids, cell synchronization, cell cycle analysis, somatic cell fusion and autoradiography.

**ANAT 812.6
Tissue Culture
1&2(2L-6P)**

The student will study the behaviour of cells and organized tissues in vitro conditions and the principles and application of tissue culture techniques. Practical work will include short and long term culturing of various tissues, as well as the isolation of cell clones. Qualitative and quantitative procedures will be studied.

**ANAT 813.6
Experimental Medicine
1&2(8P)**

Provides advanced training in experimental methods to study the normal morphology and function of tissues and their reactions to pathogenic stimuli.

**ANAT 820.3
Experimental Embryology
2(8L/P)**

Prerequisite(s): ANAT 201 and 204.

Deals with the causal analysis of embryological development as studied by morphological, surgical, physical and chemical methods. In the main, vertebrate embryos will be studied but some invertebrate material will also be used.

**ANAT 821.3
Advanced Topics in Developmental
Biology
1/2(4S)**

Prerequisite(s): ANAT 201; or equivalent and permission of the instructor.

A review of recent advances in the study of developmental biology. Special emphasis is placed on the contributions of different experimental animal systems to research in a variety of areas in the field.

**ANAT 830.3
Advanced Topics in Cell and
Molecular Biology
1/2(4S)**

Prerequisite(s): At least one senior level course in biochemistry, genetics or cell biology; or permission from the instructor.

Recent developments in cell and molecular biology research will be examined. Students will present and evaluate selected publications from current literature. Among the topics of interest are: Signal Transduction, Development and Differentiation, apoptosis, gene expression/transcription, cell and organelle structure, and DNA dynamics and chromosome structures.

**ANAT 840.3
Development of the Nervous System
1/2(1L&2S)**

Prerequisite(s): Permission of the instructor.

A comprehensive survey of the development of the vertebrate nervous system. Learning will be guided by examination of the experimental scientific literature. Topics include neurulation, cell migration, process outgrowth, trophism,

differentiation, and extended consideration of the formation of synapses and refinement of patterns of connectivity.

**ANAT 898.3
Special Topics
1/2(2S/R)**

Prerequisite(s): Permission of the department.

Study in selected areas of morphological sciences may be undertaken with the consent of the Department Graduate Committee. Involves reading assignments, lectures, and tutorials. Students will be required to participate in discussion, give oral presentations, and prepare a series of essays.

**ANAT 990
Seminar**

Graduate students in Anatomy are required to attend, and to take part in the seminars throughout the course.

**ANAT 994
Research**

Students writing a Master's thesis must register for this course.

**ANAT 996
Research**

Students writing a Ph.D. thesis must register for this course

ANESTHESIA

Department of Anesthesia, College of Medicine

This course is restricted to students enrolled in the College of Medicine.

**ANES 501.2
Anesthesiology
PD 2 weeks**

This is a compulsory rotation for final year medical students with the terminal objective that the graduating student possess the technical expertise of ACLS with the knowledge required of a family practitioner to competently prepare and counsel patients for anaesthesia and surgery at a basic level. Students are taught peri-operative management. This includes pre-operative evaluation and optimization, adult, pediatric, obstetric and outpatient anaesthesia and monitoring, and post-operative care including recovery room, intensive care and pain management. Interactive seminars and rounds cover related material. Clinical exposure is provided at the Regina General Hospital and all three Saskatoon hospitals.

ANIMAL SCIENCE

Department of Animal Science, College of Agriculture

DIPLOMA COURSES

**AN SC 41.6
Introductory Livestock Production
Science
1(3L-2P)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture

program in the College of Agriculture.

A course introducing students to the structure of the livestock industry in Canada and Saskatchewan. Includes a survey of government programs and management methods for the beef, dairy, swine, poultry and exotic livestock industries, with emphasis on sustainable farming operations. The course will also provide a scientific basis for farm animal production by exploring some of the basic biology related to animal anatomy, cell and nervous function, muscle physiology and regulation of growth and carcass quality.

**AN SC 53.3
Animal Nutrition
2(3L-2P)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture

An introduction to basic nutrition and digestion in monogastric and ruminant animals. Quantification of nutrient contribution of feeds and the consequences of deficiencies/toxicities of individual nutrient classes. Laboratory sessions cover interpretation of dietary requirements and feed analysis.

**AN SC 54.3
Animal Feeding
2(3L-2P)**

Prerequisite(s): AN SC 53.3 or permission of the instructor and enrolled in the Diploma in Agriculture program in the College of Agriculture.

A review of feed classification, emphasizing local ingredients and their use in animal feeds. Factors affecting ingredient quality, feed mixing systems, and feed processing are discussed along with feed regulations and responsibility in feed mixing. Laboratory sessions cover feeding attributes of ingredients and feed formulation.

**AN SC 56.6
Animal Breeding and Genetics
2(3L-2P)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture.

This course is designed to acquaint students with the reproductive systems of domestic animals, principles and systems of selecting and breeding farm species of livestock in purebred and commercial enterprises, genetic principles, mating systems, selection techniques, and measures of genetic progress.

**AN SC 63.3
Beef Cow-Calf Production
1(3L-2P)**

Prerequisite(s): AN SC 53.3, 54.3, 56.6; PL SC 58.3; or permission of the instructor and enrolled in the Diploma in Agriculture program in the College of Agriculture.

The cow-calf sector of the beef industry will be covered from the standpoint of national and global concerns. Facilities, breeding and calf management, feeding, health and marketing will be discussed. Laboratory sessions will include projects, seminars and tours to provide the student with practical training and knowledge of this sector of the beef industry.

**AN SC 64.3
Beef Feedlot and Sheep Production
1(3L-2P)**

Prerequisite(s): AN SC 53.3, 54.3, and 56.6; or permission of the instructor and enrolled in the Diploma in Agriculture program in the College of Agriculture.

Provides an understanding of the feeding and management of feedlot cattle and sheep housed under western Canadian environmental conditions. Emphasis is placed on global competitiveness. Facilities, feeding, health and recommended management practices will be discussed. Laboratory sessions will include projects, demonstrations, tours and computer exercises to provide practical training and knowledge in these industries.

**AN SC 75.3
Swine Production
2(3L-2P)**

Prerequisite(s): AN SC 41.6, 53.3 and 54.3; or permission of the instructor and enrolled in the Diploma in Agriculture program in the College of Agriculture.

General overview of the global and national swine industry. Facilities, feeding and recommended management practices related to the breeding herd, weaner, grower and finisher pig will be covered. Laboratory exercises will involve solving swine feeding and management problems.

**AN SC 76.3
Dairy and Poultry Production
2(3L-3P)**

Prerequisite(s): AN SC 41.6, 53.3, 54.3 and 56.6; or permission of the instructor and enrolled in the College of Agriculture program in the College of Agriculture.

A course dealing with management principles and practices in dairy and poultry production. Lecture topics will include breeding, feeding, management and marketing for both livestock classes. Laboratory sessions will provide relevant demonstrations and exercises, including some hands-on work with livestock.

**AN SC 77.6
Livestock Production Enterprises
2(4P)**

Prerequisite(s): AN SC 63.3 and 64.3; or permission of the instructor and enrolled in the Diploma in Agriculture program in the College of Agriculture.

Corequisite(s): AN SC 75.3 and 76.3

This course will expose students to practical aspects of livestock production and agribusiness. Critical analysis of specific livestock operations will be carried out using actual production and financial data. Guest lecturers will lead discussions on the most recent advances in animal agriculture, ethics, research, policy and industry structure.

**AN SC 78.3
Horse Care
2(3L-3P)**

Prerequisite(s): AN SC 53.3, 54.3 and 56.6; or permission of the instructor and enrolled in the Diploma in Agriculture program in the College of Agriculture.

A basic course on all aspects of horse management. Topics covered include conformation, nutrition, breeding, conditioning and diseases. Horse related

businesses and training methods are also discussed.

**AN SC 88.3 and 89.6
Special Topics**

These courses are offered occasionally in special situations to students enrolled in the Diploma in Agriculture program. Interested students should contact the Department of Animal and Poultry Science for more information.

DEGREE COURSES

**AN SC 212.3
Livestock and Poultry Production
1(3L-2P)**

The structure of the livestock and poultry industries. Principles, problems, and programs associated with production.

**AN SC 301.3
Animal Production Tour
1(Summer Tour)**

Prerequisite(s): AN SC 212 and permission of the instructor.

Introduces students to the diversity of animal agriculture and agri-business. Students will participate in a five day field trip that will cover traditional and exotic livestock production and marketing enterprises as well as food and feed processing facilities. Emphasis will be placed on exposing the student to livestock production conditions over the range of commercial operations found in Saskatchewan. Students will be expected to integrate information gathered from the field-trip into oral presentations and term reports with a goal of providing the student with background information necessary to complete upper year Animal Science courses. A special fee (approximately \$300.00) will be assessed to cover expenses.

**AN SC 313.3
Animal Breeding and Genetics
2(3L-2P)**

Prerequisite(s): BIOL 211; or permission of the instructor.

Qualitative and quantitative genetics applied to animal improvement. Principles and systems of selecting and breeding poultry and livestock. Introduction to molecular genetics in animals.

**AN SC 315.3
Animal and Poultry Nutrition
1(3L-2P)**

Prerequisite(s): BIOCH 200, 211; or permission of the instructor.

Lectures cover the principles of nutrition; the processes of digestion and utilization of foods and feeds; and the character, sources, function and requirements of the various nutrients. Laboratory work includes participation in laboratory analysis of feeds and practical nutritional exercises.

**AN SC 333.3
Animal Environments
2(3L-1P)**

Prerequisite(s): AN SC 212; or permission of the instructor.

An integrated approach to the needs of livestock and poultry confined in intensive husbandry systems. The relationship of physiology, behaviour and productivity to temperature, ventilation, light, pen and building layout to be discussed. A project

involving the evaluation of animal facilities is required.

**AN SC 340.3
Monogastric Animal Production I
2(3L-2P)**

Prerequisite(s): AN SC 212; or permission of the instructor. AN SC 315 is recommended.

The classification, characteristics and processing of concentrate feeds as well as operating and management applications relating to swine production. Laboratory exercises involve solving feeding and swine management problems. The course will also cover specialty feeds (pet food).

**AN SC 410.3
Grazing Animal Production
1(3L-2P)**

Prerequisite(s): AN SC 212; or permission of the instructor.

Provides senior undergraduate students with an understanding of the management, feeding and productivity of the breeding beef herd and horses. Includes both summer grazing and winter feeding management. Emphasizes the effect of climate on management and feed requirements; environmental impacts of grazing; stocking rates; plant palatability, preference and selection; nutritional behavior; nutrient cycling and energy flow; interactions with wildlife; ingestion of toxic plants.

**AN SC 411.3
Behaviour of Domestic Animals
1(3L-2P)**

Prerequisite(s): AN SC 212.

Deals with application of principles of animal behaviour to modern intensive management of domestic animals. Laboratory periods will emphasize research techniques and observation of animal behaviour.

**AN SC 420.3
Intensive Ruminant Production
2(3L-2P)**

Prerequisite(s): AN SC 212; or permission of the instructor. AN SC 315 and 340 are recommended.

Provides senior undergraduate students with an understanding of the management and feeding of ruminant animals housed under intensive farming operations. Includes forage production and storage principles, beef cattle feedlot operations and marketing, sheep and goat production, dairy cattle management and feeding as well as exotic ruminant production. Emphasizes animal management and feeding system design, ration formulation principles and product marketing with a goal of providing the student with a strong background in the basics of intensive ruminant production.

**AN SC 440.3
Monogastric Animal Production II
1(3L-2P)**

Prerequisite(s): AN SC 212; or permission of the instructor. AN SC 315 and 340 are recommended.

Review of poultry production systems with emphasis on breeding, housing and environmental control, feeding, disease prevention, and processing of meat and eggs. Lectures will integrate scientific principles with production techniques,

relate management and nutrition to problems in and the economics of industrial production and highlight current issues. Laboratories will include tours of selected poultry facilities as well as projects in artificial incubation and hatching, management techniques for poultry and judging egg quality. Similar, but less extensive coverage, will be provided for Aquaculture production systems.

**AN SC 470.3
Applied Animal Biotechnology
1(3L-4P)**

Prerequisite(s): AN SC 313; BIOL 211; VT P 324 and 325; or equivalent.

Covers reproductive technologies; transgenic techniques; molecular genetics in animal selection; use of recombinant proteins for growth, lactation and reproduction; immunological modulation of animal production; improvement of feeds and rumen organisms; improvement of health. In addition, ethical and safety aspects will be considered. Emphasizes the application and impact of biotechnological techniques on animal production.

**AN SC 480.3
Poultry Feeds and Feeding
2(3L-2P)**

Pertains to organs of digestion and the digestion of feeds, feedstuff evaluation and quality, nutrient requirements, and advanced management and problem solving with emphasis on feeding programs. Laboratory work will include ration formulation, a research project and tours of selected poultry operations.

SPECIAL TOPICS

These courses are offered occasionally in special situations. Students interested in such opportunities should contact the department for information on offerings.

AN SC 498.3

GRADUATE COURSES

Department of Animal Science, College of Graduate Studies & Research

**AN SC 800.3
Advanced Protein and Amino Acid
Nutrition
2(3L)**

Current information on digestibility, absorption and metabolism of nitrogen, proteins, amino acids and nucleic acids, as they apply to animals and man. Includes discussion on protein synthesis, protein catabolism and related regulatory mechanisms. The application of these processes in defining the dietary requirement, interaction and toxicity of essential and non-essential amino acids, including assessment of protein quality.

**AN SC 810.3
Nutrition of Grazing Ruminants
1(3L)**

A concise overview of the sources, availability, functions, requirements, deficiencies, deleterious effects and interrelationships of nutrients affecting the productivity of free-ranging wild and domestic ruminant animals. Research techniques will be emphasized.

**AN SC 811.3
The Welfare of Agricultural Animals
1(3L) Offered in alternate years**

Prerequisite(s): Permission of Instructor.

An examination of various aspects of farm animal welfare including historical, philosophical and scientific perspectives. The positions of animal interest groups, scientific societies, and commodity groups will be discussed. Emphasis will be on agricultural animals, but material relevant to laboratory animals and wildlife may also be presented.

**AN SC 812.3
Advanced Animal Genetics
1(3L)**

Special topics in genetics with emphasis on domestic animals. Approaches to testing, selection, population screening, ascertainment, and data analysis will be emphasized. Sample topics include RFLP analysis, disease associations, LOD scores, and twin studies.

**AN SC 813.3
Advanced Monogastric Nutrition
2(3L)**

Prerequisite(s): Permission of the instructor.

Lectures, seminars and discussion on special topics related to monogastric nutrition with emphasis on swine and poultry. Methods of evaluating the nutritional characteristics of feed ingredients and establishing nutrient requirements. Advanced feed formulation.

**AN SC 815.3
Advanced Ruminant Nutrition and
Metabolism
2(3L)**

Prerequisite(s): Permission of the instructor.

Covers the impact that nutrition has on ruminant metabolism in order to maintain optimal production throughout the animal's life. The main emphasis is on dairy and beef cattle. The role of nutrition in the metabolism of the fetus, the calf from birth to puberty, and of the pregnant and the lactating cow is covered. Advances in feed and animal biotechnology that may improve the efficiency of production and have an impact on metabolism are discussed. Students will be assigned to a local dairy farm, cow-calf operation, or feedlot so that they can apply the knowledge gained in this course to a practical situation. Some tours will be given.

**AN SC 817.3
Advanced Mineral Nutrition
2(3L)**

Prerequisite(s): Permission of the instructor.

A review of the biochemistry, physiology and application of mineral nutrition in ruminant and monogastric animals. Includes presentation of seminars and students will be acquainted with current analytical methodology.

**AN SC 820.3
Animal Energetics
1(3L)**

Prerequisite(s): BIOCH 200; or equivalent.

Energy flow in biology. Partition of energy. Determination of energy requirements. Factors affecting efficiency of energy utilization from the cellular to the climatic levels.

**AN SC 825.3
Nutritional Toxicology
1(3L)**

Prerequisite(s): Undergraduate biochemistry and nutrition courses and permission of the instructor.

Naturally occurring toxicants. Bacterial toxins and mycotoxins. Additives and residues. Contaminants. Drug nutrient interrelationships. Nutrient toxicity. Safety and regulatory aspects.

**AN SC 870.3
Applied Animal Biotechnology
1(3L-4P)**

Prerequisite(s): Permission of the instructor; basic genetics and physiology courses are recommended.

Covers reproductive technologies; transgenic techniques; molecular genetics in animal selection; use of recombinant proteins for growth, lactation and reproduction; immunological modulation of animal production; improvement of feeds and rumen organisms; improvement of health. In addition, ethical and safety aspects will be considered. Emphasizes the application and impact of biotechnological techniques on animal production rather than the techniques themselves.

Note: Students who have taken AN SC 470 will not be allowed to obtain credit for AN SC 870.

**AN SC 898.3
Special Topics
1&2(3L)**

Special offerings in topics relevant to Animal and Poultry Science. Examples would be Nutrition of Grazing Animals, Laboratory Techniques and Use of Statistics in Animal Experimentation. Interested students should contact the Head of the Department.

**AN SC 990
Seminar**

Reports and discussion of current research. Graduate students are required to attend and participate during their candidacy.

**AN SC 992.6
Project**

Students undertaking the project Master's degree (M.Agr.) must complete the course as part of the requirements for the degree.

**AN SC 994
Research**

Students writing a Master's thesis must register for this course.

**AN SC 996
Research**

Students writing a Ph.D. thesis must register for this course.

ANTHROPOLOGY

Department of Anthropology and Archaeology, College of Arts & Science

**ANTH 111.3
Introduction to Cultural Anthropology
1/2(3L)**

Acquaints the student with contemporary social and cultural variation. The basic mechanisms of society and culture will be explained within a comparative framework.

Note: Students with previous credit for ANTH 110 may not take this course for credit.

**ANTH 220.3
Introduction to Ethnological Theory
and Social Structure
1/2(3L)**

Prerequisite(s): ANTH 111.

Outlines the major social and cultural theories which have been developed by anthropologists. It also surveys the principles of social structure (with a special emphasis on kinship) as well as economic and political organization.

**ANTH 221.6
Indians of North America
1&2(3L)**

Prerequisite(s): ANTH 111 and ARCH 112 or NATST 110.

This survey offers a general overview of the development of North American anthropology and reviews New World prehistory. Compares and contrasts culture traits in various culture areas and deals with the specific cultural traditions of representative tribes in each culture area. Focuses on Canadian native traditions by dealing with native cultures in Saskatchewan and comparing their current political and administrative status with Indians in Mexico and the United States.

**ANTH 222.3
North American Boreal Forest
Ethnography
1/2(3L)**

Prerequisite(s): ANTH 111.

Surveys Athabaskan and Algonkian ethnohistory, ethnography and ecological adaptation with some emphasis on the contemporary situation in Boreal and Sub-Boreal Canada.

**ANTH 224.3
North American Plains Ethnography
1/2(3L)**

Prerequisite(s): ANTH 111 or NATST 110.

A comprehensive survey of the ethnography and ethnohistory of the cultures of the North American plains and prairies. The composition and development of the "plains culture complex" will be treated together with the impact of acculturation on this life-style.

**ANTH 226.3
Business and Industrial Anthropology
1/2(3L)**

Prerequisite(s): ANTH 111 or completion of 30 credit units of university including social science course.

Examination of the utility of cultural anthropology's concepts, theory, methodology and insights in creatively influencing the conduct of domestic and international business. Cross-cultural business etiquette, understanding of marketing and consumer behaviour, and importance of intercultural negotiation in solving business problems in multicultural/transnational organizational settings are also discussed.

**ANTH 230.3
Introduction to Cultural Dynamics
1/2(3L)**

Prerequisite(s): ANTH 111.

Examines some of the major dimensions of non-material culture including religion, magic, and constructs of space and time. It also examines processes of enculturation and culture change.

**ANTH 231.3
Anthropology of Health Systems: A
Cross-Cultural Perspective
1/2(3L)**

Prerequisite(s): An introductory course in the social sciences.

Examines the medical systems of practice and belief utilized by non-Western traditional societies in contending with the universal realities of disease and mental illness. The attempts to extend Western medical systems into traditional societies will also be considered.

**ANTH 232.3
Peoples and Cultures of South Asia
1/2(3L)**

Prerequisite(s): ANTH 111.

A general survey of the social, economic, political and religious institutions of the countries of South Asia from an anthropological perspective. Both the traditional cultures and the changes which are taking place are considered. Although the primary emphasis in the course is on the peoples and cultures of India, comparative materials from Pakistan, Bangladesh, Sri Lanka, Nepal, and other areas of South Asia are also examined.

**ANTH 235.3
Anthropological Approaches to
Ethnicity and Ethnic Groups
1/2(3L)**

Prerequisite(s): ANTH 111 or completion of 30 credit units at the university including an introductory social science course.

Introduction and assessment of various anthropological approaches to the study of ethnicity and ethnic groups in a cross-cultural comparative framework.

**ANTH 300.3
Reading Course
1/2(3R)**

**ANTH 301.3
Reading Course
1/2(3R)**

Prerequisite(s): Minimum of 24 undergraduate anthropology/archaeology credit units.

Supervised reading courses in a particular aspect of one of the branches of anthropology not offered in lecture form in this department. A detailed reading program will be designed on an individual basis and will be guided by regular consultation with one or more faculty members. The student is required to prepare a comprehensive proposal for approval by the Head of the Department and make arrangements with a professor to supervise the course. Students must discuss the project with the Department Head before registration.

Note: Not more than 3 credit units will be allowed for calculation of honours standing or scholarship recommendation.

**ANTH 311.3
Selected Topics in Ethnology
1/2(3L)**

Prerequisite(s): Any anthropology course

numbered 220 to 235.

Coverage of specialized areas of ethnological analysis, method and theory of an ethnographic region of the world not covered in the listed ethnology curriculum. Topics could include peasantry; cultures of Latin America, Southeast Asia or Africa; cognitive or symbolic anthropology.

**ANTH 321.3
Myth, Ritual and Symbolism
1/2(3L)**

Prerequisite(s): Any anthropology course numbered 220 to 235.

Critically examines various approaches to the study of primitive religion and ritual symbolism. The problems in the study and interpretation of myth, ritual, and symbol are considered through a survey of the works of both early social scientists and contemporary scholars. The role of symbols and ritual in social communication is examined in preliterate societies as well as modern Western civilization.

**ANTH 326.3
Principles of Applied Anthropology
1/2(3L)**

Prerequisite(s): Any anthropology course numbered 220 to 235.

Applications of anthropological concepts to contemporary culture contact and change problems. Includes treatment of social organizational analysis, adjustment strategies, community development, communication and politics. Theory, ethics, planning and contemporaneous case materials are dealt with. Methodological techniques will be introduced.

**ANTH 328.3
Political and Legal Anthropology
1/2(3L)**

Prerequisite(s): Any anthropology course numbered 220 to 235.

Analytical and comparative examination of anthropological approaches to the study of political and legal structures and processes in their sociocultural contexts focusing on structural-functional, neo-evolutionary, processual and political economy paradigms. Sources of conflict resolution and the relationships between politics, law, and religion are explored from a cross-cultural comparative framework.

**ANTH 329.3
Environmental Anthropology
1/2(3L)**

Prerequisite(s): Any anthropology course numbered 220 to 235.

Examines the variety of cultural adaptations that societies make to local environments, dealing with such adaptations as hunting and gathering, pastoralism, horticulture and intensive agriculture. It also attempts to illustrate how the principles of general ecology apply to the study of man in his environmental relationships.

**ANTH 337.3
Economic Anthropology and
Economic Development
1/2(3L)**

Prerequisite(s): Any anthropology course numbered 220 to 235.

Analytic and comparative examination of economic relations in their sociocultural contexts and a critical appraisal of anthropological approaches to the study of

economic development and underdevelopment. Primitive and peasant economic structures and transformations in their systems of exchange are assessed through substantivist, formalist, adaptivist, and political economy approaches in economic anthropology.

ANTH 339.3
Cultural Change
1/2(3L)

Prerequisite(s): Any anthropology course numbered 220 to 235.

Surveys anthropological theories relating to cultural change from the general trends of cultural evolution to the results of cross-cultural contacts. Anthropological perspectives on urbanization, modernization and social movements will be covered. Examples will come principally from non-Western societies.

ANTH 385.3
Selected Topics in the Ethnography of Central America and Mexico
2(2.5L-1.5S)

Prerequisite(s): 100-level anthropology course.

Part of the La Antigua, Guatemala Study Term Abroad. Selected themes in the ethnology of Central America and Mexico will be examined, concentrating on the indigenous peoples. Allows for cross-cultural experience and includes guest lecturers from Guatemala.

ANTH 421.3
Historical Perspectives of Ethnological Theory
1/2(3L)

Prerequisite(s): 6 credit units of 200-level anthropology and at least 3 credit units from ANTH 311, 321, 326, 328, 329, 337 or 339.

A critical survey of basic concepts, ideas and schools of thought in cultural and social anthropology in an historical perspective. Both European and North American schools are examined. The time period covered is from the beginning of the Enlightenment (1690) to the end of World War II. Includes the classical evolutionism, diffusionism, historical particularism, structural-functional approaches, structuralism, culture and personality school, and cross-cultural comparisons.

Note: Students with credit for ANTH 420 may not take this course for credit.

ANTH 422.3
Contemporary Ethnological Theory
1/2(3L)

Prerequisite(s): 6 credit units of 200-level anthropology and at least 3 credit units from ANTH 311, 321, 326, 328, 329, 337 or 339.

A critical survey of contemporary developments in ethnological theory, from the end of World War II to the present. Both European and North American approaches are examined. Covers neo-evolutionism, cultural ecology and cultural materialism, contemporary structuralism, emics, etics and new ethnography, cognitive approaches and symbolic anthropology, feminist perspectives and anthropology of gender, post-modernist approaches, hermeneutics and semiotic anthropology, Marxist anthropology, politically correct anthropology, and ethical issues in research and application.

Note: Students with credit for ANTH 420 may not take this course for credit.

ANTH 425.3
Advanced Seminar on Ethnicity and Ethnic Conflict
1/2(2.5S)

Prerequisite(s): ANTH 235 and 3 credit units of 200-level anthropology and 3 credit units from ANTH 311, 321, 326, 328, 329, 337 or 339.

Theoretical aspects of ethnicity, processes of ethnicity retention and change, and ethnic conflict are examined from cross-cultural and anthropological perspectives. Processes of intersection of race, class, ethnicity and gender are considered. Marginalization of ethnic minorities in many developing nations in the context of modernization and development is examined.

ANTH 430.3
Field Methods in Ethnology
1/2(3L)

Prerequisite(s): 6 credit units of 200-level anthropology and at least 3 credit units from ANTH 311, 321, 326, 328, 329, 337 or 339.

Topics include: historical survey of ethnological field research; formulation of a research problem; formulation and testing of hypotheses; choice of a unit of study; sampling procedures; historical and ethnohistorical data; field techniques such as participant observation; ethnographic interview; household schedule; genealogy; technical aids; projective tests, etc.

Note: Each student is expected to undergo the experience of designing and executing a research project during the term as a practical training component of this course. For all ethnology students this is a highly recommended course.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

ANTH 398.3 1/2(3S)

ANTH 399.6 1&2(3S)

ANTH 498.3 1/2(3S)

ANTH 499.6 1&2(3S)

GRADUATE COURSES

Department of Anthropology & Archaeology, College of Graduate Studies & Research

ANTH 803.3
Core Seminar in Ethnological Theory
1/2(3S)

Readings, seminars and discussion periods dealing with a wide range of theoretical developments in ethnology. The nature and dynamics of various conceptual frameworks and theoretical approaches will be critically examined, both historically and in the context of contemporary debates.

ANTH 805.3
Core Seminar in Archaeological Method and Theory
1/2(3S)

Seminars based on a series of readings dealing with the development of archaeological theory. Special emphasis

will be given to anthropological archaeology and contemporary explanatory models.

ANTH 820.3
Topics in Contemporary Ethnological Theory
1/2(3L)

A survey of the principal approaches employed by present-day social/cultural anthropologists as they seek to understand society and culture.

ANTH 821.3
Methods in Contemporary Ethnology
1/2(3L)

A survey of the methods and techniques employed in present-day social/cultural anthropological research. Problems of field work and data analysis will be considered.

ANTH 840.3
Seminar in Linguistic Anthropology
1/2(3L)

A survey of selected problems in linguistics and the ethnography of language. Problems of field work and data analysis will be emphasized.

ANTH 850.3
Research Design
1/2(3S)

Covers preparation of research designs, methods of problem development, data analysis and interpretation, and also the organization and writing of theses (including stylistic and technical aspects).

ANTH 851.3
Seminar in Archaeological Method and Theory
1/2(3S)

A survey, through discussion and analysis, of current methods and techniques of archaeological interpretation.

ANTH 852.3
Seminar in Historical Archaeology
1/2(3S)

Prerequisite(s): ARCH 352 or equivalent. Readings and discussions of the major theoretical developments and research orientations within contemporary Historical Archaeology.

ANTH 853.3
Graduate Seminar in Plains Archaeology

Prerequisite(s): ARCH 353; or equivalent. Deals with the prehistory of the Northern Plains with an emphasis on current issues and problem-solving.

ANTH 855.3
Problems in Archaeology
1&2(3S)

Research on a selected problem in archaeology or the prehistory of a selected geographic area with a problem orientation. The subject will be examined by the class as a group and in detail through conferences, readings and laboratory work. A comprehensive report will be prepared by the class.

ANTH 857.3 Seminar in Pottery Analysis 1 (3S)

Prerequisite: Permission of the instructor. Readings and discussions on the pottery produced by folk artisans in traditional settings. The mineral compositions of clays

will be considered as well as the physical makeup of pottery, and its archaeological classification. There will be a practicum involving analysis and reporting on an actual pottery assemblages from the northern plains region.

Note: This course will be offered every two years.

ANTH 858.3
Zoarchaeology
1/2(3S & 2L)

Prerequisite(s): ARCH 458 (Students may take this course concurrently).

A reading course in method and theory relating to the identification and interpretation of faunal materials from archaeological sites. A practicum involving actual faunal assemblages is included.

ANTH 860.3
Advanced Cultural Resource Management
1-every 2 years-(3S)

Prerequisite(s): ARCH 360.3 or equivalent.

Readings and discussions on methodological approaches and theory related to the management and conservation of heritage sites and materials. Examines federal and provincial legislation, contract research and public involvement. A work study program will be incorporated, involving an internship with appropriate government, museum and/or private business agencies.

ANTH 870.6
Seminar in Physical Anthropology
1&2(3S)

Guided reading and discussion course to permit advanced students to follow intensive research into special aspects of physical anthropology.

ANTH 898.3/899.6
Special Topics
1/2(3R), 1&2(3R)

Guided reading and discussion courses to permit advanced students to follow intensive library research into special aspects of anthropology.

ANTH 994
Research

Students writing a Master's thesis must register for this course.

APPLIED MICROBIOLOGY

Department of Applied Microbiology and Food Science, College of Agriculture

AP MC 212.3
General Microbiology
1(3L-2P)

Prerequisite(s): BIOL 110; CHEM 111 and 251 (may be taken concurrently).

An introduction to the general biology of microorganisms with emphasis on those of economic and environmental importance. Microbial morphology, metabolism, growth and genetics; infectious disease and immunity; environmental microbiology and waste water treatment; agricultural microbiology; food and industrial microbiology. Laboratory practice in basic microbiological techniques and their application to the study of microbial activities.

COURSES • Applied Microbiology

Note: Students with credit for MICRO 214 may not take this course for credit.

AP MC 425.3 Food Microbiology 2(3L-2P)

Prerequisite(s): AP MC 212 or MICRO 214.

The relationship of microorganisms to the food supply; food spoilage, food-borne illness, and production of fermented foods. Emphasis is placed on techniques for isolating, enumerating, and identifying important food-borne microbes.

AP MC 430.3 Microbial Ecology 2(3L-3P)

Prerequisite(s): AP MC 212 or MICRO 214; AGRIC 290 or CMPT 100.

Introduction to the diversity of microorganisms and the dynamics of microbial interactions. Microbial biogeochemistry of specific aquatic and terrestrial ecosystems. Use of microorganisms in bioremediation and waste treatment. Cultivation, analysis, and theory of microbial communities and consortia.

AP MC 433.3 Microbial Insecticides 1(3L-1T)

Prerequisite(s): AP MC 212 or MICRO 214 and permission of the instructor.

The use of microorganisms as biological insect pest control agents is a rapidly advancing area of biological, agricultural and environmental significance. Examines the microbiology and molecular biology of such pest control agents.

AP MC 434.3 Industrial Microbiology I 1(3L)

Prerequisite(s): AP MC 212 or MICRO 214.

A study of the microbiology and biotechnology of single cell protein and bakers' yeast production from surplus carbohydrates and petroleum, biochemistry of cell growth, production and usage of industrial enzymes, immobilized cells and enzymes, and microbial insecticides.

AP MC 435.3 Microbiological Techniques 2(3L-2P)

Prerequisite(s): AP MC 212 or MICRO 214 and permission of the instructor.

The theories and practical use of various microbiological techniques in industry and in quality control laboratories. Includes: media design and sterilization; enumeration and identification of bacteria; enzyme formation, extraction and usage for industrial purposes; filtration techniques; analysis of nutrient utilization, microbial cell components and fermentation parameters.

AP MC 437.3 Industrial Microbiology II 2(3L-1P)

Prerequisite(s): AP MC 212 or MICRO 214; Corequisite(s): BIOCH 211.

The principles of design and operation of fermentation equipment; aerobic and anaerobic fermentation processes leading to industrial chemicals, antibiotics, vitamins and amino acids with emphasis on biochemistry. Influence of biotechnology on

the fermentation industry. Demonstrations, films, and field trips are included.

AP MC 450.3 Microbiology of the Rumen 2(3L)

Prerequisite(s): AP MC 212 or MICRO 214; BIOCH 211.

A detailed study of the microflora and microfauna indigenous to the rumen and of the role of the rumen microbiota in nutrition of the host animal.

SPECIAL TOPICS

These courses are offered occasionally in special situations. Students interested in such opportunities should contact the department for information on offerings.

AP MC 498.3

GRADUATE COURSES

Department of Applied Microbiology and Food Science, College of Graduate Studies & Research

AP MC 801.3 Laboratory in Fermentation Technology 1(1L-5P)

Prerequisite(s): AP MC 212, 434, and 437 or equivalents; BIOCH 200 (or 203); laboratory experience in research and written permission of the Head of the Department.

Designed to familiarize limited numbers of students with fermentation research techniques used at the University of Saskatchewan. Commercially available microbes will be used to transform substrates to a variety of end products. Emphasizes operational aspects of laboratory scale fermenters, computer control and measurement of parameters using modern equipment, enzymes and chemical assays.

AP MC 803.3 Genetics of Industrial Microorganisms 2(2L-1S)

Prerequisite(s): AP MC 437, BIOCH 220 (or 203), and MICRO 386 or equivalents; or an undergraduate degree in microbiology or biochemistry. Previous course work in genetics is desirable.

Detailed study of the genetics of industrially important microorganisms and their relationship to the relevant practices. Seminar presentations review research literature related to the lecture topics.

AP MC 806.3 Anaerobic Microbiology 2(3L)

Prerequisite(s): AP MC 212 and MICRO 386 or equivalent; or permission of the instructor.

Studies the biology and cultivation of anaerobic microorganisms and of their application to agricultural and industrial processes.

AP MC 807.3 Microbial Biotechnology in Industry and Agriculture 2(3L-1S)

Prerequisite(s): AP MC 212, 434 and 437, BIOCH 220 (or 203), MICRO 386 or

equivalent; or permission of the instructor.

Principles of biotechnology as they apply to useful products and processes involved in industry and agriculture, including food production and processing.

AP MC 808.3 Brewing Microbiology 1(3L-2P)

Prerequisite(s): AP MC 212 and 425 or equivalent; FD SC 412 or 812 is recommended.

A comprehensive review of the status and current problems in brewing microbiology, wild yeast and bacteria in brewing; use of selective and general media for their isolation and enumeration; yeast washing; brewery quality control; yeast propagation, storage, handling and fermentation; beer pasteurization.

AP MC 825.3 Carcinogens and Mutagens 2(2L-1S)

Prerequisite(s): A course in biochemistry [BIOCH 220 (or 203)], knowledge of general cell biology (ANAT 201), general microbiology (AP MC 212 or MICRO 214), and permission of the instructor.

Provides some understanding of carcinogens and mutagens, their mechanism of action at organismic, cellular and molecular levels, and of their testing and assessment. Short seminar discussions of current developments will be included.

AP MC 830.3 Microbial Ecology 2(3L)

Prerequisite(s): AP MC 212 or MICRO 214; CMPT 100 or AGRIC 290.

Introduction to the diversity of microorganisms and the dynamics of microbial interactions. Microbial biogeochemistry of specific aquatic and terrestrial ecosystems. Selective microbial enrichment and isolation. In situ quantitation of microbial activity.

AP MC 831.3 Laboratory in Microbial Ecology 2(3L)

Prerequisite(s): AP MC 430 or 830 (may be taken concurrently); and permission of the instructor.

Designed to introduce modern experimental and computer modeling techniques for the study of microbial interactions. Laboratories will include the use of microbial enrichment cultures to isolate organisms of geochemical and industrial significance; in measurement of microbial proliferation and metabolic activity under in situ conditions; and in dynamics of microbial interactions and effects of environmental stress.

AP MC 833.3 Microbial Insecticides 1/2(3L)

Prerequisite(s): AP MC 212 or MICRO 214 or equivalent.

Microorganisms as biological insect pest control agents is a rapidly advancing area of applied microbiology and agriculture. Examines the microbiology and molecular biology of such pest control agents.

AP MC 836.3 Food Microbiology 1(3L)

Prerequisite(s): AP MC 212 and 425 or equivalent, and BIOCH 220 (or 203); or permission of the instructor.

Applications of biotechnology to food microbiology. Emphasis on genetic engineering of starter cultures used to produce fermented foods, microbial processing of food wastes, and rapid methods for detection and enumeration of microorganisms.

AP MC 837.3 Industrial Microbiology 2(3L-3P)

Prerequisite(s): Permission of the instructor.

Principles of design and operation of fermentation equipment, aerobic and anaerobic fermentation processes leading to industrial chemicals, antibiotics, vitamins and amino acids with emphasis on biochemistry. Influence of biotechnology on the fermentation industry. Demonstrations, field trips and special projects are included.

AP MC 838.3 Laboratory in Microbial Insecticides 2(1L-4P)

Prerequisite(s): AP MC 433/833 and permission of the department.

Experimental methods in the production, molecular analysis and use of microbial insecticides. Commercially available and experimental microbial insecticides will be used to demonstrate principles of bioassay, culturing pathogens, characterization of insecticidal molecules, mycoinsecticide action, cuticle degrading enzyme production and commercial bacterial insecticide application technology.

AP MC 850.3 Microbiology of the Rumen 2(3L-1S)

Prerequisite(s): Permission of the instructor.

A detailed study of the microflora and microfauna indigenous to the rumen and of the role of the rumen microbiota in nutrition of the host animal. Seminars will involve reading and discussion of recent literature in selected areas.

AP MC 898.3/899.6 Special Topics and Techniques 1&2(R-T-P)

Reading assignments, tutorials and laboratory projects in selected areas related to the student's major field of study. A series of term papers, reviews or laboratory reports will be required.

AP MC 990 Seminar

Seminars are held weekly throughout the year. Current literature in the field of Applied Microbiology and Biotechnology is reviewed and discussed, and papers on current research topics are presented. Graduate students are required to attend and to participate.

AP MC 992.6 Project

Students undertaking the project Master's program (M.Agr.) must register for this course.

**AP MC 994
Research**

Students writing a Master's thesis must register for this course.

**AP MC 996
Research**

Students writing a Ph.D. thesis must register for this course.

**ARCHAEOLOGY/BIOLOGICAL
ANTHROPOLOGY***

Department of Anthropology and Archaeology, College of Arts & Science

*Students with previous ANTH credit for the following ARCH courses may not take the ARCH courses for credit.

**ARCH 112.3 (Formerly ANTH 112)
Introduction to Archaeology and
Biological Anthropology
1/2(3L)**

Acquaints the student with the principal dimensions of the growth of human culture from its earliest beginnings. The processes of biological evolution will be discussed and related to the cultural evolution.

Note: Students with previous credit for ANTH 110 or 112 may not take this course for credit.

**ARCH 116.3
Introduction to Near Eastern and
Classical Archaeology
1/2(3L)**

Introduction to the archaeology of ancient Egypt, Mesopotamia, Israel and surrounding regions, Greece and Rome. The course examines how archaeologists use material remains to reconstruct ancient societies, focusing on the archaeological characteristics and cultural dynamics of major periods, and the relationship between human communities and the environment.

**ARCH 243.3 (Formerly CLASS 243.3)
Introduction to the Archaeology of
Ancient Israel and Syria
1/2(3L)**

Prerequisite(s): ARCH 112 or 116.

Introduction to the archaeology of ancient Israel and Syria focusing on methodology, major sites, and cultural reconstruction from the development of early agricultural settlements during the Neolithic period to the major city-states of the Canaanite Middle Bronze Age.

Note: Students with credit for CLASS 237 or 243 may not take this course for credit.

**ARCH 244.3 (Formerly CLASS 244.3)
Archaeology and Cultural Development in
Ancient Israel and Syria-Late Bronze
Age to Hellenistic Period
1/2(3L)**

Prerequisite(s): ARCH 112 or 116 (ARCH 243 is recommended).

Examines the archaeological reconstruction of cultural development in the regions of ancient Israel and Syria from the Late Bronze Age to the Hellenistic Period, focusing on methodological issues, major sites, and the defining characteristics of the cultures themselves.

Note: Students with credit for CLASS 237 or 244 may not take this course for credit.

**ARCH 250.3 (Formerly ANTH 250)
Introduction to Archaeological
Science
1/2(3L-1P)**

Prerequisite(s): ARCH 112 or 116.

A study of the theory, methods and techniques used by archaeologists in survey, excavation, analysis and interpretation. Emphasizes methods and techniques. Laboratory instruction will be given in the handling of archaeological material and data.

**ARCH 251.3 (Formerly ANTH 251)
Archaeological Interpretation of
Prehistory
1/2(3L)**

Prerequisite(s): ARCH 112 or 116.

A survey of prehistory with emphasis on the application of the theory, methods and techniques of modern archaeology.

**ARCH 255.3 (Formerly ANTH 255)
Prehistory of North America
1/2(3L)**

Prerequisite(s): ANTH 111 and ARCH 112.

Provides an overview of pre-contact cultural development across North America utilizing a cultural ecological approach.

**ARCH 257.3 (Formerly ANTH 257)
Archaeology of Ancient Egypt
1/2(3L)**

Prerequisite(s): ARCH 112.

A study of the archaeological evidence for the reconstruction of ancient Egyptian culture from the Neolithic through to the Roman periods, focusing on the particular characteristics of archaeology in Egypt, major cultural periods, and significant sites.

**ARCH 258.3 (Formerly ANTH 258)
Archaeology of Ancient Mesopotamia
1/2(3L)**

Prerequisite(s): ARCH 112.

A study of the archaeological evidence for the development of the cultures of ancient Mesopotamia from the Neolithic through to the Persian periods, focusing on the particular characteristics of Mesopotamian archaeology, major cultural periods, significant sites, and the relation of urban centres to the surrounding regions.

**ARCH 270.3 (Formerly ANTH 270)
Human Evolution
1(3L-3P)**

Prerequisite(s): ARCH 112 or BIOL 110 (strongly recommended). It is expected that students will have had Biology 30 with a laboratory, or BIOL 107.

An introductory overview of human biology including the background for evolutionary biology, and the evolution, structure, and function of certain primate patterns.

**ARCH 300.3
Reading Course
1/2(3R)**

**ARCH 301.3
Reading Course
1/2(3R)**

Prerequisite(s): Minimum of 24 undergraduate anthropology/archaeology credit units.

Supervised reading courses in a particular aspect of one of the branches of anthropology not offered in lecture form in this department. A detailed reading

program will be designed on an individual basis and will be guided by regular consultation with one or more faculty members. The student is required to prepare a comprehensive proposal for approval by the Head of the Department and make arrangements with a professor to supervise the course. Students must discuss the project with the Department Head before registration.

Note: Not more than 3 credit units will be allowed for calculation of honours standing or scholarship recommendation. These courses are not available for graduate credit.

**ARCH 350.3 (Formerly ANTH 350)
Introduction to Boreal Forest
Archaeology
1/2(3L)**

Prerequisite(s): ARCH 250 or 251.

An introduction to the archaeology of the boreal forest region stretching from Quebec to the northern prairie provinces, and including southern Keewatin and adjacent southeastern Mackenzie. The archaeological cultures will be discussed in detail and the methodological and theoretical approaches to the archaeology of this region.

**ARCH 351.3 (Formerly ANTH 351)
North American Arctic Archaeology
1/2(3L)**

Prerequisite(s): ARCH 250 or 251.

A survey of the prehistoric cultural sequence in the Arctic area of North America including Alaska, Canada and Greenland. The examination of special archaeological problems and research developed in the area will also be emphasized.

**ARCH 352.3 (Formerly ANTH 352)
Historical Archaeology
1/2(3L)**

Prerequisite(s): ARCH 250 or 251.

Study of the method and theory of historical archaeology in North America with emphasis on recent developments in the field. Topics include critical use of documentary sources, historic artifact and faunal analyses, pattern recognition, frontier archaeology and others will be explored.

**ARCH 353.3 (Formerly ANTH 353)
Plains Archaeology
1/2(3L)**

Prerequisite(s): ARCH 250 or 251.

A survey of the prehistory of the Plains region of North America with emphasis on the recognition and examination of archaeological problems.

**ARCH 355.3
Archaeology of the American
Southwest
1/2(3L)**

Prerequisite(s): ARCH 250 or 251.

An introduction to prehistoric cultural development across the American Southwest from initial occupation to the arrival of the Spanish. Theoretical concepts, especially those related to the adoption of agriculture and questions concerning abandonment, are emphasized.

**ARCH 356.3 (Formerly ANTH 356)
The Development of Complex Cultures
in the Eastern Mediterranean and
Near Eastern Regions
1/2(2L-1S)**

Prerequisite(s): ARCH 243 or 244 or 250 or 251.

A study of the development of complex cultures in the eastern Mediterranean and Near Eastern regions from the hunting and gathering societies of the Upper Palaeolithic period to the establishment of complex urban cultures during the Early Bronze Age, with an emphasis on the geographical areas of ancient Syria and Israel.

**ARCH 358.3 (Formerly ANTH 358)
The Paleolithic World
1/2(3L)**

Prerequisite(s): ARCH 250 or 251.

A detailed survey of human cultural development from earliest hominids on to the emergence of modern humans and concluding with the shift towards food production. Emphasis is on the nature of interpretations formed from archaeological data and the contemporary issues surrounding these interpretations.

**ARCH 360.3 (Formerly ANTH 360)
Archaeological Resource
Management
1/2(3L)**

Prerequisite(s): ARCH 250 or 251.

Provides a theoretical and methodological introduction to the management and conservation of archaeological sites and materials. Examines federal and provincial legislation, contract research and public involvement. Case studies and in-depth areas of contract archaeology will be discussed.

**ARCH 361.6 (Formerly ANTH 361)
Archaeological Field Methods
S&S-1&2(60P)**

Prerequisite(s): ARCH 250 or 251.

Six weeks of field experience in archaeological research techniques including site survey, excavation, and laboratory analysis. The field location will depend on areas of departmental projects. Offered only in Spring and Summer Session.

Note: Students with credit for ANTH 261 may not take this course for credit.

**ARCH 362.6 (Formerly CLASS 360.6)
Field Course in Mediterranean
Archaeology**

Prerequisite(s): One of the following two sets of courses: ARCH 243 and 244, or CLASS 247 and 248 and permission of instructor.

A field course in Mediterranean Archaeology. Participation in a supervised excavation, interpretation of stratigraphy, architectural features, artifacts and other physical remains.

**ARCH 375.3 (Formerly ANTH 375)
Human Palaeontology
1/2(3L-3P)**

Prerequisite(s): ARCH 270, or GEOL 243 or 246.

Intensive survey of hominid evolution based upon the interpretations of the fossil record.

COURSES • *Archaeology*

ARCH 452.3 (Formerly ANTH 452) **Selected Topics in Archaeology** **1/2(3L)**

Prerequisite(s): ARCH 251 and 3 credit units in senior archaeology.

ARCH 453.3 (Formerly ANTH 453) **Selected Topics in Archaeology** **1/2(3L)**

Prerequisite(s): ARCH 251 and 3 credit units in senior archaeology.

Provides coverage of specialized areas of archaeological analysis, method and theory. Topics include lithic analysis, pottery analysis, faunal analysis, study of microwear.

ARCH 454.3 **Rock Art Studies** **1/2(3L)**

Prerequisite(s): ARCH 250 or 251 and a 300-level archaeology or ART 252.6.

The study of rock art across the world with emphasis on pre-contact North America. Analytical methods and theoretical concepts will also be discussed.

ARCH 455.3 (Formerly ANTH 455) **Introduction to Lithic Technology** **1/2(3L)**

Prerequisite(s): ARCH 251 or 250 and a 300-level archaeology course.

Basics of stone tool manufacturing and usage, including the analysis of materials, breakage, debitage, typologies, use wear, and Old and New World tool classes. The behavioral and social context of lithic technology will also be emphasized.

ARCH 457.3 (Formerly ANTH 457) **Introduction to Prehistoric Pottery Technology** **1/2(3L)**

Prerequisite(s): ARCH 251 or 250 and a 300-level archaeology course.

A broad perspective on prehistoric pottery including the nature of clays, pottery production and use, the physical properties of pottery and pottery assemblages on the Canadian plains and adjacent boreal forest.

ARCH 458.6 (Formerly ANTH 458) **Zooarchaeology** **1&2(3L)**

Prerequisite(s): ARCH 470 or BIOL 351.

The identification of vertebrate faunal remains from archaeological sites including an examination of interpretive procedures and quantitative methods.

ARCH 459.3 **Geoarchaeology** **1/2(3L)**

Prerequisite(s): GEOL 121, 122 and ARCH 250. GEOL 246 is recommended.

Deals with the basic components of geoarchaeology including: stratigraphy, site formation processes, and landscape reconstruction. Various methods used in paleoenvironmental reconstruction are also discussed focusing on the late Quaternary of North America.

ARCH 461.3 (Formerly ANTH 461) **Historical Development of Modern Archaeology** **1/2(3L)**

Prerequisite(s): ARCH 251 and 3 senior

credit units in archaeology.

Overview of the history of archaeology, beginning with 18th- and 19th-century developments in western Europe. The expansion of archaeology throughout the world is examined, with discussion of the development of the major schools.

Advances in field methodology, laboratory analyses and theoretical concepts are emphasized.

Note: Students with credit for ANTH 451 may not take this course for credit.

ARCH 462.3 (Formerly ANTH 462) **Contemporary Archaeological Theory** **1/2(3L)**

Prerequisite(s): ARCH 251 and 3 senior credit units in archaeology.

Detailed survey of the basic concepts and schools of thought in contemporary archaeology considered on a world-wide basis, with emphasis on Canada and the United States. Theoretical models relating to culture history, settlement, ecological and other approaches are discussed.

Note: Students with credit for ANTH 451 may not take this course for credit.

ARCH 465.3 (Formerly ANTH 465) **Spatial Analysis of Archaeological Data** **1/2(3L)**

Prerequisite(s): A 300-level course in archaeology or ARCH 243 or 244.

Spatial analysis examines the distribution of artifacts, ecofacts and features in the archaeological record and assesses the extent to which the distribution reflects past human activity, social structures, etc. Familiarizes students with theories of spatial analysis and provides practical experience in applying these theories to archaeological data.

ARCH 470.3 (Formerly ANTH 470) **Human Osteology** **1(3L-3P)**

Prerequisite(s): ARCH 270.

A comprehensive investigation of the human skeleton. Primary emphasis involves preparing students for archaeological fieldwork and advanced research in biological anthropology.

ARCH 471.3 (Formerly ANTH 471) **Forensic Anthropology** **2(3L-3P)**

Prerequisite(s): ARCH 470.

Concerned with the analysis of human skeletal materials and specifically the identification of age, sex, stature, race and other features. Laboratory sessions supplement lectures.

ARCH 472.3 **Palaeopathology** **1/2(L)**

Prerequisite(s): ARCH 470.

The diagnosis and interpretation of disease in antiquity and the overall health status of earlier human populations. Although skeletal pathology will be emphasized, analysis of mummified tissues and ancient DNA will be included.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these

courses should contact the department for more information.

ARCH 398.3 1/2(3S)

ARCH 399.6 1&2(3S)

ARCH 498.3 1/2(3S)

ARCH 499.6 1&2(3S)

GRADUATE COURSES

Department of Anthropology and Archaeology, College of Graduate Studies & Research

ARCH 860.3 Advanced Cultural Resource Management **1/2(3S)**

Prerequisite: ARCH 360.3 or equivalent.

Readings and discussions on methodological approaches and theory related to the management and conservation of heritage sites and materials. Examines federal and provincial legislation, contract research and public involvement. A work study program will be incorporated, involving an internship with appropriate government, museum and/or private business agencies.

ARCH 990.0 Seminar

Prerequisite: Enrolment in the Department of Anthropology / Archaeology Graduate Program.

During residence, all graduate students will register in ARCH 990 and will present at least one paper based on their own research. Graduate students are required to attend and interested undergraduate students may be invited to attend.

ARCHITECTURE

See Regional and Urban Development Program in the Arts & Science section of the *Calendar*.

ART

Department of Art and Art History, College of Arts & Science

Undergraduate Art Studio courses are listed by the following disciplines:

Painting

Drawing

Printmaking

Sculpture

Extended Media, Photography, and Digital Imagery

Studio/Art History Course

For Art History courses see Art History.

Old and New Course Equivalencies

Old

ART 110.6 Art History ARTH 120.3, 121.3

ART 114.6 Sculpture ART 141.3

ART 116.6 Photography ART 161.3

ART 135.6 Extended Media ART 136.3

ART 181.3, 182.3 Drawing ART 112.6

ART 214.6 ART 241.3, 242.3

ART 271.3, 272.3 Painting ART 211.6

ART 281.3, 282.3 ART 212.6

ART 314.6 ART 341.3, 342.3

ART 335.6 ART 338.3, 339.3

ART 371.3, 372.3

ART 381.3, 382.3

ART 414.6

ART 435.6

ART 420.6

ART 424.6

ART 434.6

ART 471.3, 472.3

ART 473.3, 474.3

ART 475.3, 476.3

ART 481.3, 482.3

ART 483.3, 484.3

ART 485.3, 486.3

ART 311.6

ART 312.6

ART 441.3, 442.3

ART 438.3, 439.3

ART 418.3, 419.3

ART 443.3, 444.3

ART 445.3, 446.3

ART 411.6

ART 421.6

ART 431.6

ART 412.6

ART 422.6

ART 432.6

PAINTING

ART 111.6 **Foundation in Painting** **1&2(2T-2P)**

Explores the principles and elements of the language of art as related to the process of painting. Discussion and exposure to a variety of tools, materials, and media will be included. Historical reference to stylistic changes and various aesthetic concepts will be explored.

Note: Painting students must provide their own painting materials.

ART 211.6, 311.6, 411.6 **Painting and Related Work** **1&2(3T)**

Prerequisite(s): ART 111 is a prerequisite to ART 211. Subsequently, 6 credit units in each number level are prerequisite to the next level.

Continual identification of concepts and methods as they relate to the expression, structure, media and skills of pictorial art. Students may experiment with painting media and work from any subject matter. Students must acquaint themselves with the materials of their craft and its correct use in producing technically sound works of art. Emphasizes the student's artistic growth and development.

Note: Painting students must provide their own painting materials.

ART 421.6 **Special Studies: Painting and Related Work** **1&2(3T)**

Prerequisite: ART 411.6 and permission of the instructor.

Emphasizes the student's independent artistic growth and development in painting.

Note: Painting students must provide their own painting materials.

ART 431.6 **Special Studies: Painting and Related Work** **1&2(3T)**

Prerequisite: ART 421.6 and permission of the instructor.

Emphasizes the student's independent artistic growth and development in painting.

Note: Painting students must provide their own painting materials.

DRAWING

ART 112.6 **Foundation in Drawing** **1&2(3T)**

Introduction to the formal and creative language of drawing. The course emphasizes the development of drawing

skills and identification of concepts and methods as they relate to visual perception and expression.

Note: Drawing students must provide their own drawing materials.

ART 212.6, 312.6, 412.6
Drawing and Related Work
1&2(3T)

Prerequisite(s): ART 112 is prerequisite to ART 212. Subsequently, 6 credit units in each number level are prerequisite to the next level.

Continual identification of concepts and methods as they relate to visual perception and expression through drawing, compositional design, graphic media and skills. Use of diverse media coupled with invented and observed form is encouraged.

Note: Drawing students must provide their own drawing materials.

ART 422.6
Special Studies I: Drawing and Related Work
1&2(3L)

Prerequisite: Permission of the instructor and ART 412.6

Emphasizes the student's independent growth and development as it relates to drawing.

Note: Drawing students must provide their own drawing materials.

ART 432.6
Special Studies II: Drawing and Related Work
1&2(3L)

Prerequisite: Permission of the instructor and ART 412.6

Emphasizes the student's independent growth and development as it relates to drawing.

Note: Drawing students must provide their own drawing materials.

PRINTMAKING

ART 113.6
Foundation in Printmaking
1&2(1.5T-1.5P)

Explores the conceptual, expressive and technical processes of three main areas of printmaking – lithography, silkscreen and intaglio. Discussion and exposure to a variety of equipment, materials and media will be included.

ART 213.6
Printmaking
1&2 (2T)

Prerequisite(s): ART 113.

Exploration of an advanced level of the conceptual, expressive and technical means of four major print methods: Etching, Lithography, the Relief Print and Serigraphy and related photographic methods. Thorough familiarity with the craft of the traditional print methods as well as experimentation will be encouraged.

ART 313.6, 413.6
Printmaking
1&2(2T)

Prerequisite(s): ART 213 is prerequisite to ART 313; ART 313 is prerequisite to ART 413.

Explores the conceptual, expressive and technical processes of all areas of printmaking. Advanced concepts and processes are all a part of choices students

can make concentrating in two or more distinct areas of printmaking.

ART 423.6, 433.6
Special Studies: Printmaking
1&2(1.5T)

SCULPTURE

ART 141.3
Foundation in Sculpture
1/2(1.5T)

An introduction to the concepts and issues relating to contemporary sculpture. This combined lecture/studio class encourages a wide exploration of materials while focusing on basic formal and compositional skills.

Note: For this class, sculpture students provide their own materials.

ART 241.3, 242.3, 341.3, 342.3, 441.3, 442.3
Sculpture and Related Work
1/2(3T)

Prerequisite(s): ART 141 is a prerequisite to ART 241 or ART 242. Subsequently, 6 credit units in each number level are prerequisite to the next level.

Continual identification of the concepts, materials and means of sculpture and related three-dimensional form. Methods of construction (casting, carving, building, assembling, etc.) and presentation, both traditional and experimental, will be encouraged. This includes a wide exploration of materials and combination of materials (such as wood, metal, cement, plaster, found objects, etc.).

ART 443.3, 444.3, 445.3, 446.3
Special Studies: Sculpture and Related Work
1/2(3T)

EXTENDED MEDIA, PHOTOGRAPHY, AND DIGITAL IMAGERY

ART 136.3
Foundation in Extended Media
1/2(1L/2S)

This introductory studio course explores collaborative and interdisciplinary approaches to contemporary art-making. Sessions include lectures and experiential, interactive activities, leading to the development of multidisciplinary projects. All disciplines within the university community are welcome. No background in studio art is necessary.

ART 161.3
Foundation in Photography I
1(3T)

Introduction to the basic elements of black and white photography. Theory and practical application will be taught through the direct experience with the camera. Black and white film development and printing will be practiced.

Note: Photography students must provide their own cameras and photographic materials.

ART 216.6, 316.6, 416.6
Photography
1&2(3P)

Prerequisite(s): ART 161 is a prerequisite to ART 216. Subsequently, 6 credit units in each number level are prerequisite to the

next level.

Continual development in the creative language of photography both expressive and technical. Includes black and white, and colour photography (at the 316 level). Theory and practical application will be approached through assigned projects and independent work.

Note: Photography students must provide their own cameras and photographic materials.

ART 236.3, 237.3, 338.3, 339.3, 438.3, 439.3
Extended Media
1&2(3T)

Prerequisite(s): ART 135 or completion of at least two foundation-level studio art classes, or permission of the department; subsequently 6 credit units in each number level are prerequisite to the next level.

Continued exploration of collaborative and interdisciplinary approaches to contemporary artmaking. Projects will include alternative practices such as video, performance, installation, projection, bookworks, etc. Reading and discussion of related texts will accompany production of artworks.

ART 336.6
Digital Imagery
1&2(3T)

Prerequisite(s): A 100-level studio course. Conceptual and technical development of the student's work in digital imagery. Adobe Photoshop software will be used to introduce students to photomontage techniques, negative and print enhancement. Critical and theoretical concerns in the medium will be discussed and related to the given assignments.

ART 426.6, 436.6
Special Studies: Photography
1&2(3T)

Prerequisite(s): Permission of the department.

SEMINAR COURSE

ART 430.6
Problems in Contemporary Art
1&2(2T)

Prerequisite(s): Completion of the requirements of the second year of the B.F.A. or B.A. Three-year or B.A. Four-year with a major in studio art.

Deals with key issues in contemporary art. Original documents, theories and criticisms, and subsequent interpretations and current literature, pertaining to contemporary art will serve as source material for topics selected by individual students for investigation. Faculty and students will participate through ongoing presentations and discussions.

STUDIO/ART HISTORY COURSE

ART 350.3
Hands-on Art History: A Survey of Historical Media
1/2(3T)

Prerequisite(s): One of ARTH 120, 121, 111, or 112 (181). Access to email is highly recommended.

A practical course which explores the techniques of various historical media such as: mosaic, encaustic, stained glass,

carving in stone or wood, applique, lantern making, jewelry, manuscript illumination, printing, tempera painting, fresco, and oil painting. Students will gain practical experience using these older and sometimes forgotten techniques.

Theoretical tracts from various historical periods will be examined for recipes and analyses of contemporary studio practices.

Note: This course can be used toward either studio or art history requirements in Art degree programs. HOAH students must provide their own materials, which may cost from \$30 to \$200. There is no text for the course.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

- ART 298.3 1/2(3S)
- ART 299.6 1&2(3S)
- ART 398.3 1/2(3S)
- ART 399.6 1&2(3S)
- ART 498.3 1/2(3S)
- ART 499.6 1&2(3S)

GRADUATE COURSES

Department of Art and Art History, College of Graduate Studies

ART 830.6
Critical Issues in Contemporary Art and Culture
1&2(1L-2S)

This seminar will deal with key problems in contemporary art. Primary sources, as well as subsequent interpretations and current literature all pertaining to modern art, will serve as source material for topics selected by individual students for investigation. Faculty and students will participate through ongoing presentations and discussions.

Note: Students receiving credit for ART 430 may not receive credit for ART 830.

ART 838.3 and 839.3 (Formerly 835)
Extended Media
1/2(1L&2S)

Prerequisite(s): B.F.A. degree.

A practical and theoretical course extending the range of studio techniques beyond those of normal specialization. Projects will include alternative practices such as video, performance, installation, projection, and bookworks. Reading and discussion of related texts will accompany production of artworks.

ART 841.3 and 842.3 (Formerly 814.6)
Sculpture
1/2(1L-2S)

Research and continual identification of the concepts, materials, and means of sculpture will be pursued. Methods of construction, fabrication, and casting will be studied. Both traditional and experimental approaches will be encouraged. Wide exploration of materials and combinations such as metals, wood, plastics, fiberglass, fabric, cement, and stone will be encouraged.

**ART 851.3 and 852.3 (Formerly 813.6)
Printmaking
1/2(1L&2S)**

Prerequisite(s): B.F.A. degree.
Studio work and exploration of the conceptual, expressive and technical means of four major print methods will be offered: Etching, Lithography, Relief Print and Serigraphy. Related photographic methods will be demonstrated. Thorough familiarity with the craft of the traditional print methods, as well as experimentation will be encouraged.

**ART 861.3 and 862.3 (Formerly 816.6)
Photography
1/2(1L&2S)**

Prerequisite(s): B.F.A. degree.
Continued development in the creative language of photography, both expressive and technical. The study will include still, motion, black and white, and color photography. Theory and practical application will be approached through direct experience with the camera and with the developing and printing processes.

**ART 871.3 and 872.3 (Formerly 811.6)
Painting Media
1/2(1L-2S)**

Continual identification of concepts and methods as they relate to the expression, structure, media, and skills of painting. Students may experiment with any or all painting media and work from a choice of subject matter. Emphasis is on students' artistic growth and development.

**ART 881.3 and 882.3 (Formerly 812.6)
Drawing
1/2(1L-2S)**

Continual identification of concepts and methods as they related to visual perception and expression through drawing, compositional design, graphic media, and skills. Use of diverse media coupled with invented and observed form is encouraged.

**ART 898.3/899.6
Special Topics
1/2(3L), 1&2(3L)**

Offered occasionally by regular and visiting faculty and in other special situations. Students interested in this course should contact the department for more information.

**ART 922.6
Project Paper**

This is a major paper and will require proper documentation. Based on appropriate research under Option A. One of the following approaches to the writing of the paper should be specified:

- An exhibition history, the intent of which is to allow students the opportunity to examine in detail their development as artists. This paper can use other artists or periods of art history for purposes of comparison;

or

- A research paper. This paper more closely approximates the generally accepted notion of theses and has as its content a specific topic in the History of Art or Art Criticism.

**ART 990
Seminar**

All graduate students are required to attend biweekly departmental seminars during the first two years of their program. Students will present their exhibition research and participate in seminar discussions. departmental faculty and visiting lecturers also contribute to the program.

**ART 995
M.F.A. Exhibition**

This is a major studio component of the M.F.A. Degree. Students must select the best from work completed during the two years and mount an acceptable exhibition. This exhibition constitutes the major emphasis of the students' study and research. The examining committee consists of three Art Department faculty and one external examiner.

ART EDUCATION

Department of Curriculum Studies, College of Education

**EDART 303.3
Teaching Visual Art in Elementary Schools
1/2(3L)**

Prerequisite(s) or Corequisite(s): EDCUR 200 and a fine arts course.

Introduces elementary classroom teachers to current issues, principles and methods needed in visual art programs including art basics, processes, media, practices and resources. Consideration will be given to health and safety concerns, classroom management, art criticism, gender equity and cultural/historical approaches in art curriculum planning.

Note: Students may receive credit for only one of EDART 300, 303, 310 and 311.

**EDART 311.3
Teaching Visual Art in Middle Years
1/2(3L)**

Prerequisite(s) or Corequisite(s): EDCUR 200 and a fine arts course.

Offers prospective middle years classroom teachers information on current issues, principles and methods in visual art programs including art basics, processes, media, practices and resources. Consideration will be given to health and safety concerns, classroom management, art criticism, gender equity and cultural/historical approaches in art curriculum planning.

Note: Students may receive credit for only one of EDART 300, 303, 310 and 311.

**EDART 331.3
Teaching Visual Art in the Secondary School
2 (1L-1S-2P)**

Prerequisite(s): EdCur 200 and 12 credit units in Art including 6 credit units in Art History.

Provides prospective secondary teachers in art an overview of history and practice, current concerns, principles, teaching methods, and resources for curriculum planning and teaching art in secondary schools.

**EDART 401.3
Textile Art for Classroom Teachers
1/2 (1L-1S-2P)**

Prerequisite(s): EDART 303 or 311 or 331.
Explores various media and methods in textile art appropriate for the school classroom. Image development, art elements and principles, cultural and historical considerations and responding to art will be studied and applied in the context of textile art appropriate for Saskatchewan curriculum in visual art.

**EDART 411.3
Art and the Built Environment in Art Education
1/2(1L-1S-2P)**

Prerequisite(s): EDART 303 or 311 or 331.
Explores the complexity and interrelationships of art forms in the built environment such as architecture, furnishings, sculpture, murals and signage. Consideration will be given to cultural and historical developments, community planning and current societal issues. Teaching strategies, materials, processes and art forms will be studied.

**EDART 421.3
Ceramics for Teachers
1/2 (1L-3P)**

Prerequisite(s): EDART 303 or 311 or 331.
Explores methods of teaching ceramics. Teaching strategies and resources, exploration of forming processes, methods of finishing and enhancing in clay, kiln firing, health and safety concerns, and cultural and historical developments will be studied as applicable for the Saskatchewan curriculum in visual art.

**EDART 433.3
Advanced Methodology in Art Education
2 (1L-1S-2P)**

Prerequisite(s): EDART 303 or 311 or 331 and EX PR 402.

Helps prospective secondary art teachers to study personal strengths and to work on their shortcomings in moving towards preparedness for teaching. Topics will include knowledge of methodology in art education, media and processes, classroom management, health and safety, cultural and historical approaches, gender equity, evaluation, fostering individual growth in perception, cognition, creativity and skill.

**EDART 441.3
Art History for Teachers
1/2 (2L-2S)**

Prerequisite(s): EDART 303 or 311 or 331.
Introduction to teaching art history as an aspect of the visual art curriculum in Saskatchewan schools. Introduces the body of knowledge, the pre-eminent concerns of the field, and teaching methodologies appropriate to the various course levels.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

EDART 498.3 1/2(3S)

ART HISTORY

Department of Art and Art History, College of Arts & Science

For Art Studio courses see Art.

* Denotes courses with a date of 1800 or earlier.

**ARTH 120.3
Introduction to the History of Art I
1(3L)**

An introduction to the history of western visual culture from Ancient Greece to the Renaissance. The principles of art historical study will be examined.

Note: Students with credit for ARTH 110 may not take this course for credit.

**ARTH 121.3
Introduction to the History of Art II
2(3L)**

An introduction to the history of western visual culture from the seventeenth century to the present day. The principles of art historical study will be examined.

Note: Student's with credit for ARTH 110 may not take this course for credit.

Note: ARTH 120 and 121 may be taken under Requirement 5 or 7 of Program Types A, B, C, and Requirement 1 of Program Type D.

**ARTH 252.6
First People's Art History
1&2(3L)**

A survey of the art of the First Peoples of North America from the precontact era to the present. Particular emphasis will be placed on artistic production after 1940.

**ARTH 257.6
Introduction to Canadian Art History
1&2(3L/S)**

Prerequisite(s): ARTH 120 and 121, or a course in the areas of fine arts or humanities.
Offers a brief introduction to traditional Native Canadian art practices and a survey of Canadian visual culture from the earliest period of European settlement to the present day. The institutional, geographic and social locations of artistic production and consumption will be studied. Issues of race, ethnicity, gender and class will be addressed.

***ARTH 260.3
History and Theory of European Architecture 1400-1700
1/2(3L/S)**

Prerequisite(s): ARTH 120 and 121.

An introduction to the architecture of the European states and their colonies 1400 to 1700. The institutional, geographic and social locations of architectural production will be studied. Issues of power, nationalism, and class will be examined.

Note: Students with credit for ARTH 262 may not take this course for credit.

***ARTH 261.3
History and Theory of European Architecture 1700-1900
1/2(3L/S)**

Prerequisite(s): ARTH 120 and 121.

An introduction to the architecture of the European states and their colonies 1700 to 1900. The institutional, geographic and social locations of architectural production

will be studied. Issues of power, nationalism, and class will be examined.
Note: Students with credit for ART 262 may not take this course for credit.

***ARTH 305.6**
Art of the 15th Century
1&2(3L/S)

Prerequisite(s): ARTH 120 and 121, or HIST 225.

A history of 15th-century European painting and sculpture both north and south of the Alps. Special emphasis will be placed on Leonardo da Vinci, and the formal and iconographic sources for major monuments will be considered in their historic contexts.

•ARTH 308.3 (Formerly 306)
Art of the High Renaissance and Reformation Era (1500-1550)
1/2(3L)

Prerequisite(s): ARTH 120 and 121.

The High Renaissance, Mannerism, and other trends in European painting and sculpture will be considered in the context of the Reformation; special emphasis will be placed upon Raphael, Michelangelo, and Dürer.

•ARTH 309.3 (Formerly 306)
Art of the Late Renaissance (1550-1600)
1/2(3L)

Prerequisite(s): ARTH 120 and 121.

Artistic trends in the second half of the 16th century will be considered in the context of the Council of Trent; special emphasis will be placed upon Late Titian, Tintoretto, Veronese, and the painters of the Medicean Studio.

***ARTH 317.6**
Art of the 17th and 18th Centuries
1&2(3L/S)

Prerequisite(s): ARTH 120 and 121 or HIST 226.

Baroque, "Baroque Classicism" and Rococo in Italy, France, Holland, Germany, England and Spain will be discussed.

ARTH 319.6
Studies in 19th Century Visual Culture
1&2(3L/S)

Prerequisite(s): ARTH 120 and 121.

Investigates 19th Century visual culture in Western Europe and North America. Examines the social production and consumption of visual culture, addressing issues of race, gender, sexuality and class. Issues of historiography will also be considered.

ARTH 322.6
Picturing the West: Representing the American and Canadian Frontiers, 1820-1940
1&2(1.5L-1.5S)

Prerequisite(s): ARTH 120 and 121.

An examination of the ways the West was represented in visual culture during the period of colonial exploration and settlement. Photography, film, wild west events, painting, mapping and responses of First Peoples will be studied in the context of issues of race, gender and class.

ARTH 323.3
European Colonialism in the Visual Arts 1880-1920
1/2(3S)

Prerequisite(s): ARTH 120 and 121.

Examines how visual culture played a central role in legitimizing European colonial expansion of the late 19th and early 20th centuries. Photography, painting, popular prints, postcards, world fairs, and the urban planning of colonial cities will be studied. Anti-colonial resistance will also be examined.

ARTH 324.3
Early 20th-Century Studies in Art and Architecture 1900-1918
1/2(3L/S)

Prerequisite(s): ARTH 120 and 121.

A study of visual culture and architecture in Europe and North America from 1900 to the end of World War I. Issues concerning art institutions, gender, class and the impact of modernism will be studied.

Note: Students with credit for ART 320 may not take this course for credit.

ARTH 325.3
Early 20th-Century Studies in Art and Architecture 1918-1940
1/2(3L/S)

Prerequisite(s): ARTH 120 and 121.

A study of visual culture and architecture in Europe and North America from 1918 to World War II. Issues concerning art institutions, nationalism, gender, class and the impact of modernism will be studied.

Note: Students with credit for ART 320 may not take this course for credit.

ARTH 326.3
Studies in Photographic History 1830-1920
1/2(3L/S)

Prerequisite(s): ARTH 120 and 121.

An introduction to the study of photography from the earliest experiments to 1920. Areas include photographic theory, art photography and commercial production. Special emphasis will be placed on photography in a Canadian context.

Note: Students with credit for ART 321 may not take this course for credit.

ARTH 328.3
Studies in Photographic History 1920 to the Present
1/2(3L/S)

Prerequisite(s): ARTH 120 and 121.

An introduction to the study of photography from 1920 to current practices. Areas include recent critical debates, commercial production and the impact of new technologies. Special emphasis will be placed on photography in a Canadian context.

Note: Students with credit for ART 320 may not take this course for credit.

ARTH 352.3
Digital Culture and the Art of the Internet
2 (3S)

Prerequisites: 12 credit units of Art History including ARTH 120 or ART 121.

A seminar course of directed studies which focus on the impact of the Internet, the computer, and distance technologies upon

the production and consumption of visual culture since the 1970s.

Note: While there is no required text book, course participants will be asked to purchase a "course pack" for about \$30.

***ARTH 406.6**
Renaissance Studies
1&2(3S)

Prerequisite(s): 12 credit units in history or art history, including either ARTH 120 and 121 or HIST 225.

A detailed investigation of the works of one of the following: Donatello, Leonardo da Vinci, Raphael, Dürer, Titian, Michelangelo. The Renaissance as a concept in the history of style will receive special emphasis.

***ARTH 417.6**
Baroque Studies
1&2(3S)

Prerequisite(s): 12 credit units in history or art history, including either ARTH 120 and 121 or HIST 226.

A detailed investigation of the works of one of the following: Bernini, Rubens, Rembrandt. The Baroque as a concept in the history of style will receive special emphasis.

ARTH 418.3
Studies in Contemporary Art
1&2(3S)

Prerequisite(s): ARTH 120 and 121 and a second or third-year course in art history.

A survey of contemporary international art which includes film, video, performance, as well as more traditional media.

ARTH 419.3
Studies in Contemporary Architecture, Late Modern to the Present
1&2(3S)

Prerequisite(s): ARTH 120 and 121 and a second or third-year course in art history.

A survey of contemporary international architecture from Late-Modernism through Post-Modernism to current issues.

ARTH 437.3
Postcolonial Issues in Contemporary Canadian Art
1/2(3S)

Prerequisite(s): ARTH 120 and 121.

Examines recent work by artists, video/film producers and curators in Canada. Explores topics such as anti-colonial resistance by First Peoples' artists; diaspora identities and aesthetics; multiculturalism; and the role of museums and exhibitions in fictioning Canadian national identity.

ARTH 440.6
Studies in Contemporary Canadian Art
1&2(3S)

Prerequisite(s): ARTH 120, 121 and 257.

An introduction to developments in Canadian Art since 1970, with particular attention to how this art has raised interests of social and cultural significance. Issues of representation with respect to gender, race and class will be examined in the context of various theoretical discourses.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these

courses should contact the department for more information.

ARTH 298.3 1/2(3S)
 ARTH 299.6 1&2(3S)
 ARTH 398.3 1/2(3S)
 ARTH 399.6 1&2(3S)
 ARTH 498.3 1/2(3S)
 ARTH 499.6 1&2(3S)

ASTRONOMY

Department of Physics and Engineering Physics, College of Arts & Science

ASTRO 101.6
Descriptive Introduction to Astronomy
1&2(3L-3P)

Prerequisite(s): Mathematics B30 (or, under the old mathematics curriculum, Algebra 30 or Mathematics 30).

A descriptive introduction to astronomy without advanced mathematics covering constellations, historical astronomy, telescopes, spectral analysis, planetary motion, including recent discoveries about planets, properties and evolution of stars, pulsars, black holes, galaxies and cosmology. The evening labs will allow students to use telescopes and to analyze data.

ASTRO 212.3
Astronomical Observation Techniques
1(2L-4P)

Prerequisite(s): ASTRO 101 or PHYS 111 or 121 or 128.

An introduction to the use of telescopes for imaging of celestial objects, stellar spectroscopy and photometric studies of variable stars and star clusters. Astronomical co-ordinate systems and techniques for measurement of stellar and galactic distances and masses will be discussed. Evening labs will acquaint students with the use of a CCD, camera, spectrometer, photometer and several telescopes.

ASTRO 310.3
Galactic Astronomy and Cosmography
2(3L)

Prerequisite(s): ASTRO 101 or 212; PHYS 128 or PHYS 251; MATH 224 or 226 or 238.

Offered in 2000-2001, then in alternate years.

An examination of spiral, elliptical, peculiar and radio galaxies, dark matter, Hubble's law of universal expansion, galactic collisions and cannibalism, quasars and supermassive black holes. The course also investigates Big Bang nucleosynthesis, the age, expansion and future of the universe, space curvature, rival cosmographical theories and dark sky paradox.

ASTRO 312.3
Theoretical Models of Stars and Stellar Evolution
2(3L)

Prerequisite(s): ASTRO 101 or 212 (recommended); PHYS 128 or PHYS 251; MATH 224 or 226 or 238.

Offered in 2001-2002, then in alternate years.

An examination of the successes and failures of stellar evolution theory in tracking the protostar, main-sequence, red giant, supernova, pulsar and black hole stages in the lives of stars. Students will study physical models of stellar structure and nuclear energy generation and investigate the solar neutrino mystery.

**ASTRO 320.3
Astronomy of the Solar System
2(3L)**

Prerequisite(s): ASTRO 101 or 212; PHYS 128 or PHYS 251; MATH 224 or 226 or 238.

Offered in 2000-2001, then in alternate years.

An investigation of the formation, evolution and dynamics of the solar system. The physical properties of the sun, planets and other bodies are examined and used to constrain evolutionary models. The prospects and evidence for the existence of life elsewhere in the solar system and the detection of extrasolar planets are also considered.

**ASTRO 411.3
Gravitation and Cosmology
2(3L)**

Prerequisite(s): PHYS 251; MATH 338, and at least 3 credit units in astronomy, or permission of the department.

Offered in 2001-2002, then in alternate years.

An introduction to general relativity as a theory of gravitation with applications to cosmology. Includes: principles of special and general relativity, tensor calculus in curved spacetime, Einstein's field equations, Schwarzschild solution, experimental tests of general relativity, black holes, standard cosmological models, unresolved cosmological issues, gravitational waves.

BIOCHEMISTRY

Department of Biochemistry, College of Medicine

For details on the B.Sc. in Biochemistry see the College of Arts & Science section.

**BIOCH 200.3
Molecules of Life
1/2(3L)**

Prerequisite(s): Biology 30 or 3 credit units of university-level biology, and CHEM 112. CHEM 250 recommended.

Topics include: simple and complex biomolecules, amino acids, peptides, proteins, carbohydrates, lipids, nucleic acids, coenzymes, vitamins. An introduction to the structure of biological membranes, solute transport, DNA replication, mRNA transcription and protein synthesis will be presented.

**BIOCH 207.2
Veterinary Biochemistry
Q1&2(2L-2P)**

Prerequisite(s): Registration in the D.V.M. Program or permission of the instructor. Selected biochemical topics with special relevance to function at the level of the whole organism will be presented. The emphasis will be placed on comparative

metabolic aspects of the major food and companion animal species, especially those metabolic differences which occur that are related to performance, productive capacity, and disease processes.

**BIOCH 211.3
Introductory Metabolism
2(3L)**

Prerequisite(s): BIOCH 200.

Introduction to the thermodynamic aspects of energy metabolism and the principles of anabolic and catabolic metabolic pathways. Emphasis will be placed on the overall purposes of the major pathways, the precursor molecules leading into these pathways, important products, and the basic types of control that regulate metabolic flux.

**BIOCH 212.3
Introductory Biochemical Techniques
2(3L/4P)**

Prerequisite(s): BIOCH 200.

The theory, application and practice of basic biochemical techniques used in all life science and biotechnology disciplines is presented. Topics include: buffer preparation, pH determination, spectrophotometric methods, enzyme measurement, chromatography, radioisotopes, and methods for the characterization and separation of amino acids, sugars, lipids, proteins, enzymes, and DNA such as ultra centrifugation, chromatography and electrophoresis.

**BIOCH 213.8
Medical Biochemistry & Nutrition
1&2 PA**

Prerequisite(s): Restricted to students enrolled in the College of Medicine.

Reviews the structure and function of biomolecules, organization and general principles of metabolism, production and utilization of energy, and replication and expression of genetic information. Selected topics in human nutrition will be reviewed, including nutritional assessment, diet and physiological status, primary nutritional diseases, nutritional considerations in other diseases, and public health aspects of nutrition. The use of biochemical knowledge in the investigation and management of human disease will be emphasized through a case-oriented approach.

**BIOCH 220.3
Introductory Plant Biochemistry
1(3L)**

Prerequisite(s): BIOCH 200 or BIOL 110, and CHEM 251.

This introduction to plant biochemistry presents the following: photosynthesis, respiration, and energy generation; nitrogen, carbohydrate, lipid, and some secondary metabolism. The emphasis will be on metabolic events that are typical of plants, and often different from other living organisms.

**BIOCH 230.3 (Formerly 300)
Information Transfer - DNA to Proteins
2(3L)**

Prerequisite(s): BIOCH 200.

Deals with the structure and function of nucleic acids at an advanced level. Chromosome anatomy, DNA replication, transcription of genes, and translation of

mRNA in both prokaryotes and eukaryotes are covered. The various mechanisms whereby gene expression is regulated are also discussed.

**BIOCH 310.3
Proteins and Enzymes
1(3L/4P)**

Prerequisite(s): BIOCH 212; CHEM 250 and permission of the department.

Preference will be given to students in biochemistry programs.

The properties of proteins and enzymes will be described including structure, kinetics, regulation and modification, antibodies, membrane proteins and glycosylation. Laboratories will provide experience with the determination of structural and functional properties including: ultracentrifugation, chromatography, electrophoresis, kinetics, phosphoamino acid identification, Western blotting, computer-based sequence analysis via the Internet.

**BIOCH 311.3
Introductory Molecular Biology
1(3L/4P)**

Prerequisite(s): BIOCH 212, CHEM 250, and one of BIOCH 230, BIOL 211, or MICRO 216 and permission of the department.

MICRO 214 or AP MC 212 recommended. Preference will be given to students in the biochemistry programs.

Basic principles and techniques of nucleic acid manipulations used in molecular biology and biotechnology are presented. Information and practical experience with plasmids, restriction endonucleases, PCR, DNA sequencing, site-directed mutagenesis, cloning, hybridization, analysis of RNA and gene promoters, and protein over-expression are presented. The laboratory component will also include an Internet exercise.

Note: Students cannot obtain credit for this course and MICRO 391 (395).

**BIOCH 412.3
Protein Structure, Function, and Engineering
2(3L)**

Prerequisite(s): BIOCH 310 and CHEM 250.

The details of protein structure, domains, folding and targeting, and modern experimental approaches to protein engineering will be presented. The inter-relationship between structure and regulation shall be stressed.

Note: This course will be offered in the academic year 2003/2004 and alternate years thereafter (2005/2006, etc.).

**BIOCH 420.3
Advanced Plant Biochemistry
2(3L)**

Prerequisite(s): BIOCH 200., 220; BIOCH 230 or BIOL 211, CHEM 250. Students with credit for BIOCH 300 have met the BIOCH 230 prerequisite.

This advanced course presents the following topics: recent advances in metabolic control, photosynthesis, nitrogen assimilation, and secondary metabolism; the structure and function of selected proteins and the application of protein engineering; selected topics illustrating the biochemical basis of plant biotechnology.

Note: Students cannot obtain credit for this course and BIOCH 433. This course will be offered in the academic year 2002/2003 and alternate years thereafter (2004/2005, etc.).

**BIOCH 430.3
Cell Biochemistry
2(3L)**

Prerequisite(s): BIOCH 211, 310, CHEM 250.

The biochemical properties of eukaryotic cells will be investigated with special emphasis on signal transduction mechanisms, cell-cell extracellular matrix interactions, cell cycle control, apoptosis, neoplastic transformation and tumor progression.

Note: This course will be offered in the academic year 2003/2004 and alternate years thereafter (2005/2006, etc.).

**BIOCH 432.3
Lipid Metabolism
1(3L)**

Prerequisite(s): BIOCH 211, CHEM 250.

A review of selected aspects of the biochemistry of lipids, emphasizing their function and metabolism.

Note: This course will be offered in the academic year 2002/2003 and alternate years thereafter (2004/2005, etc.).

**BIOCH 435.3
Intermediary Metabolism
1(3L)**

Prerequisite(s): BIOCH 211, CHEM 250.

The organization of metabolic pathways dealing with carbohydrates, lipids, amino acids and nucleotides with emphasis on common strategies employed in different pathways, and the overall regulation and integration of metabolic flow into cells, in tissues, and in intact organisms.

Note: This course will be offered in 2002/2003 and alternate years thereafter (2004/2005, etc.).

**BIOCH 436.3
Advanced Molecular Biology
2(3L)**

Prerequisite(s): BIOCH 311 or MICRO 391 (or 395).

Modern and advanced methods and strategies of nucleic acid manipulation, and characterization of genes in cells and whole organisms are presented. Topics include; PCR applications; delivery of genes into cells and animals, generation of transgenic and gene knockout animals, DNA fingerprinting, and aspects of molecular medicine such as screening approaches for genetic diseases.

Note: This course will be offered in 2002/2003 and alternate years thereafter (2004/2005, etc.).

**BIOCH 488.3
Research Approaches in Biochemistry
1/2 (8P)**

Prerequisite(s): BIOCH 310, 311, or MICRO 391 (or 395) (may be taken concurrently) and permission of the department.

Preference will be given to biochemistry honours students.

The student will work on a project available in the research laboratory of a faculty member, under that faculty member's supervision; become familiar with the pertinent research literature; establish

procedures, collect, record and analyze experimental results; submit to the department a written report which incorporates the background to the work done, procedures used, results obtained and a discussion of the results and their significance.

**BIOCH 489.6
Extended Research Approaches in Biochemistry
1 & 2 (8P)**

Prerequisite(s): BIOCH 310, 311, or MICRO 391 (or 395) (may be taken concurrently) and permission of the department. Preference will be given to biochemistry honours students.

The student will: work two terms on a project available in the research laboratory of a faculty member, under that faculty member's supervision; become familiar with the pertinent research literature; establish procedures, collect, record and analyze experimental results; submit to the department a written thesis which incorporates the background to the work done, procedures used, results obtained and a discussion of the results and their significance. The student will defend the thesis findings.

**BIOCH 490.0
Seminar
1 & 2 (1S)**

The biochemistry seminar series presents a wide range of topics from the life sciences.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

- ART 298.3 1/2(3S)
- ART 299.6 1&2(3S)
- ART 398.3 1/2(3S)
- ART 399.6 1&2(3S)
- ART 498.3 1/2(3S)
- ART 499.6 1&2(3S)

GRADUATE COURSES

Department of Biochemistry, College of Graduate Studies & Research

**BIOCH 800.3
Information Transfer - DNA to Proteins
2(3L)**

Prerequisite(s): BIOCH 200 (or 203) and CHEM 251; or permission of the department.

Deals with the structure and function of nucleic acids at an advanced level. Chromosome anatomy, DNA replication, transcription of genes, and translation of mRNA in both prokaryotes and eukaryotes are covered. The various mechanisms whereby gene expression is regulated are also discussed.

Note: Students cannot obtain credit for this course and BIOCH 230, 300, 334, or 834.

**BIOCH 810.3
Proteins and Enzymes
1(3L/4P)**

Prerequisite(s): BIOCH 212 (or 203); permission of the department.

The properties of proteins and enzymes will be described including structure, kinetics,

regulation and modification, antibodies, membrane proteins and glycosylation. Laboratories will provide experience with the determination of structural and functional properties including: ultracentrifugation, chromatography, electrophoresis, kinetics, phosphoamino acid identification, Western blotting, computer-based sequence analysis via the Internet.

Note: Students cannot obtain credit for this course and BIOCH 310, 341, 429, 841, or 829.

**BIOCH 811.3
Introductory Molecular Biology
1(3L/4P)**

Prerequisite(s): BIOCH 212 (or 203); one of BIOCH 230, 300, 334, 800, 834; BIOL 211; MICRO 216; permission of the department required. MICRO 214 or AP MC 212 recommended.

Basic principles and techniques of nucleic acid manipulations used in molecular biology and biotechnology are presented. Information and practical experience with plasmids, vectors, restriction endonucleases, DNA sequencing, site-directed mutagenesis, simple cloning, hybridization, promoter analysis and protein over-expression. In addition mRNA analysis, eukaryotic cloning and DNA fingerprinting will be presented.

Note: Students cannot obtain credit for this course and BIOCH 311, 341 or 841 or MICRO 391 (395).

**BIOCH 812.3
Protein Structure, Function, and Engineering
2(3L)**

Prerequisite(s): BIOCH 310 or 810 ; or 441 or 841 and 429 or 829; or permission of the department.

The details of protein structure, domains, folding, and targeting shall be presented. Modern experimental approaches to protein engineering shall be presented. The inter-relationship between structure and function in enzyme/protein mechanism and regulation shall be stressed.

Note: This course will be offered in 2001-2002 and in alternate years thereafter (2003-2004, etc.).

**BIOCH 820.3
Advanced Plant Biochemistry
2(3L)**

Prerequisite(s): BIOCH 200 (or 203); BIOCH 220 and one of BIOCH 230, 300, 334, 800, 834, and BIOL 211; or permission of the department.

This advanced course presents the following topics: recent advances in metabolic control, photosynthesis, nitrogen assimilation, and secondary metabolism; the structure and function of selected proteins and the application of protein engineering; selected topics illustrating the biochemical basis of plant biotechnology.

Note: Students cannot obtain credit for this course and BIOCH 433 or 833. This course should be offered in 2002-2003 and in alternate years thereafter (2004-2005, etc.).

**BIOCH 830.3
Cell Biochemistry
2(3L)**

Prerequisite(s): BIOCH 211 (or 203); BIOCH 334 or 834; or permission of the

department.

The biochemical properties of eukaryotic cells will be investigated with special emphasis on signal transduction mechanisms, cell-cell extracellular matrix interactions, cell cycle control, apoptosis, neoplastic transformation and tumor progression.

Note: This course will be offered in 2001-2002 and in alternate years thereafter (2003-2004, etc.).

**BIOCH 832.3
Lipid Metabolism
1(3L)**

Prerequisite(s): BIOCH 211 (or 203); or permission of the department.

A review of selected aspects of the biochemistry of lipids, emphasizing their function and metabolism.

Note: This course will be offered in 2003-2004 and in alternate years thereafter (2005-2006, etc.).

**BIOCH 835.3
Intermediary Metabolism
2(3L)**

Prerequisite(s): BIOCH 211 (or 203); or permission of the department.

The organization of metabolic pathways dealing with carbohydrates, lipids, amino acids and nucleotides with emphasis on common strategies employed in different pathways, and the overall regulation and integration of metabolite flow into cells, in tissues, and in intact organisms.

Note: This course will be offered in 2002-2003 and in alternate years thereafter (2004-2005, etc.).

**BIOCH 836.3
Advanced Molecular Biology
2(3L)**

Prerequisite(s): one of BIOCH 311, 811, MICRO 391, 395; or permission of the department.

Modern and advanced methods and strategies of nucleic acid manipulation and characterization are presented. Topics include; uses of the polymerase chain reaction; generation and screening of libraries; cloning and expression of foreign genes; RFLPs and molecular medicine.

Note: This course will be offered in 2002-2003 and in alternate years thereafter (2004-2005, etc.).

**BIOCH 843.3
X-ray Crystallographic Structure Determination
1(3L/3P)**

Prerequisite(s): BIOCH 200 (or 203); or equivalent and permission of instructor; MATH 110, and 112 or 116 are also advisable.

Describes the principles, methodology, application and limitations of the techniques in x-ray crystallographic structure elucidations. The methods employed to solve both small molecule and macromolecular crystal structures will be discussed and a small molecular structure determination will be carried out by the students.

Note: This course will be offered in 2002-2003 and in alternate years thereafter (2004-2005, etc.).

**BIOCH 850.3
Current Topics in Biochemistry
1&2(L-S)**

Prerequisite(s): Permission of the department.

Students registered for a Master's degree should register for this course.

Based upon current biochemical literature. Papers will be assigned to students for presentation (a minimum of two) and departmental faculty will present papers and lectures and current research topics. Students will be evaluated on their presentation, participation and a term paper.

**BIOCH 851.3
Current Topics in Biochemistry
1&2(L-S)**

Prerequisite(s): Permission of the department. Students registered for a Ph.D. degree should register for this course.

Based upon current biochemical literature. Papers will be assigned to students for presentation (a minimum of two) and departmental faculty will present papers and lectures and current research topics. Students will be evaluated on their presentation, participation and a term paper.

**BIOCH 898.3
Special Topics**

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

**BIOCH 990
Seminar**

All Biochemistry graduate students must register annually for this course. Seminars are held weekly throughout the year. The Biochemistry seminar series presents a wide range of topics from the life sciences. Students specializing in biochemistry are required to attend these seminars throughout their program and may be required to attend seminars in related fields given in other departments or institutions on the campus.

**BIOCH 994
Research**

Students writing a Master's thesis must register for this course.

**BIOCH 996
Research**

Students writing a Ph.D. thesis must register for this course.

BIOLOGICAL, DIAGNOSTIC AND SURGICAL SCIENCES

Department of Biological, Diagnostic and Surgical Sciences, College of Dentistry

FOUR YEAR D.M.D. PROGRAM

**BD&SS 201.2 (Formerly D&S S 201)
Oral Radiology
2(1L)**

This course serves as an introduction to the principles and practice of oral radiology. Lectures cover the underlying principles of production and interaction of x-rays, radiation hygiene and image production.

Principles of intra-oral, radiographic techniques are discussed.

**BD&SS 214.2 (Formerly O BIO 214)
Oral Histology and Embryology
1(2L)**

A lecture and laboratory course that studies the development, histology and function of oral structures that have special significance to dentistry. Course content considers the processes involved in craniofacial development; the development of the teeth and palate; and the histology of hard and soft tissues of the oral and perioral regions.

**BD&SS 225.2 (Formerly O BIO 225)
Dental Anatomy and Morphology
1(2L/P)**

This is an introductory course in dental anatomy, morphology and occlusion. The general objective is to provide the undergraduate dental student with the knowledge of dental anatomy, morphology and occlusion that forms the basis for much of the practice of clinical dentistry.

**BD&SS 226.2 (Formerly BD&SS
325.4)
Occlusion**

A lecture, laboratory and clinical course that provides an understanding of tooth and arch interrelationships. Occlusal concepts and practices related to removable and fixed prosthodontics will be discussed. Clinical experience will include: diagnostic impression, model fabrication, facebow registration/transfer, articulation mounting, occlusal analysis and night guard delivery.

**BD&SS 301.4 (Formerly D&S S 301)
Oral Radiology
1(3C), 2(2C)**

This is primarily a preclinical laboratory course which provides instruction on intra-oral radiographic technique. Didactic instruction will be minimal. Practical information will also be provided on panoramic, lateral cephalometric, and digital radiography.

**BD&SS 314.4 (Formerly O BIO 314)
Oral Microbiology, Immunology and
Physiology
1(2L), 2(2L)**

This course considers those areas of microbiology, immunology and physiology with special significance to dentistry. Major topics are oral microflora and ecology; molecular biology of microbial adherence; formation and metabolism of dental plaque; microbiology of dental caries and periodontal disease; immunology of dental caries and periodontal disease; physiology of salivary glands and saliva; classification and physiology of neuroreceptors and their integration/modulation by the central nervous system; and the physiology of pain, taste, swallowing and mastication.

**BD&SS 319.4 (Formerly D&S S 319)
Periodontics
1(1L), 2(1L-3C)**

A lecture and clinical demonstration course which provides an introduction to the etiology, pathogenesis and epidemiology of diseases that affect the periodontal tissues. Students will be given opportunities to provide preventive periodontal care in the clinic.

**BD&SS 348.2 (Formerly D&S S 348)
Diagnosis
2(1L, 2C)**

Prepares students for clinical management of patients. It includes a systematic approach to diagnostic and patient management. Students are introduced to history taking, examination, laboratory testing and record systems. The problem-oriented approach to diagnosis and management is presented. A complementary clinical course provides experience to prepare students for clinical sessions in diagnosis and patient management.

**BD&SS 353.2 (Formerly D&S S 353)
Local Anesthesia
1&2(1L)**

The objectives of this course are to teach students the basic principles of administering local anesthetics safely and effectively. Topics to be discussed will include the indications and advantages of regional anesthesia, and the various techniques available to the dentist. Emphasis will be placed upon an understanding of the pharmacologic actions of local anesthetics and vasoconstrictors and their side effects and complications. Proper patient evaluation to identify high-risk patients will be stressed.

**BD&SS 401.4
Oral Radiology
1&2(1L-1S)**

Lectures, self-instructional packages, and seminars cover normal radiographic appearances in the jaws as well as the radiographic manifestations of disease processes. Time is also spent discussing general principles of radiographic interpretation. The clinical component of this course involves selecting an appropriate intra-oral radiographic series, taking intra-oral radiographs and interpreting intra-oral and panoramic radiographs of clinic patients that the student sees in the Diagnosis clinic.

**BD&SS 419.4
Periodontics
1&2(1L-3C)**

A lecture/laboratory/clinic course designed to enable students to become competent in diagnostic skills and to develop the clinical skills necessary to perform periodontal therapy within the context of a comprehensive dental treatment plan. Students review current aspects of the scientific literature during seminar sessions.

**BD&SS 448.2
Diagnosis
1&2(1L), 2(3C)**

Principles of treatment planning are covered in Term 1 to prepare students for practice in the clinic. In Term 2, students are responsible for performing diagnosis and treatment planning under faculty guidance. Various oral medicine topics, including temporomandibular disorders (TMD) and other orofacial pain states, are covered in Term 2.

**BD&SS 453.2
Sedation and Pain Control
1(1L-2P)**

Lectures and demonstrations are used to introduce concepts of managing patient apprehension through the use of various techniques of conscious sedation. Although students will gain facility mainly with the use of nitrous-oxide/oxygen inhalation sedation, other modalities will also be covered. The indications, advantages and disadvantages, and complications of the various techniques will be discussed.

**BD&SS 455.2
Basic Internal Medicine
1(1L)**

Consists of lectures/seminars. Common medical problems affecting dental management are discussed and illustrated using case reports.

**BD&SS 463.4
Oral and Maxillofacial Surgery
1&2(1L-3C)**

Introduces students to the basic principles on which the practice of oral and maxillofacial surgery is founded. Self-instruction manuals are introduced for this purpose, and their use is incorporated directly into the course format. Proper history taking and patient assessment are stressed, and students are introduced to the core theoretical knowledge and basic surgical skills and sterile techniques needed to practice minor oral surgery. Students are taught basic and advanced techniques for the removal of teeth, and the prevention and management of their intraoperative and postoperative complications. The selection and prescribing of appropriate analgesic and antibiotic medications is discussed. Students are taught to recognize, manage and/or refer orofacial infections. Students are rostered into the oral surgery clinic where opportunity is given initially to observe and assist, and then to participate in minor oral surgical procedures. Students are also introduced to hospital dentistry, including operating room protocol and observing major maxillofacial surgery.

**BD&SS 466.2
Hospital Rosters
1&2(1L)**

Students are assigned for one week to Royal University Hospital and rotate through various medical services and hospital dentistry. Under the guidance of the medical and house staff, students observe and participate in the patient care and management of diseases that they have studied to appreciate the effects of these and gain further insight into medical problems they may encounter in their practice.

**BD&SS 486.4
Oral Pathology
1(3L)&2(2L)**

This lecture series provides the students with the knowledge and understanding of diagnosis, pathogenesis, clinical and histologic features, management, and prognosis of oral diseases with emphasis on their oral manifestations and implications. Topics include developmental abnormalities of the oral hard and soft tissues; infections of the oral cavity;

physical and chemical injuries of the oral cavity; benign and malignant neoplasms; the oral manifestations of metabolic, dermatologic, hematologic and immunologic disease; fibro-osseous lesions; non-odontogenic and odontogenic tumors and cysts; salivary gland disease; and forensic odontology.

**BD&SS 501.4
Oral Radiology
2(1L-2C)**

This is a clinical course involving the selection of intra-oral radiographic series in the Diagnosis clinic, taking intra-oral radiographs in the Radiology roster and occasionally the Diagnosis clinic, and the interpretation of intra-oral and panoramic and other selected radiographs in interpretation sessions.

**BD&SS 519.4
Periodontics
1&2(1L-4C)**

This course emphasizes and reinforces the methods of managing periodontal diseases that have been learned earlier. Recent advances in periodontics will be introduced and seminars involving student presentation of case reports will be held. Student clinical experience is continued in the form of comprehensive care.

**BD&SS 536.2
Special Topics in Oral Biology
1(1L)**

The relevance of the basic sciences to clinical dentistry and the scientific basis of various aspects of clinical dentistry are examined in detail.

**BD&SS 547.2
Medical-Dental Relationships
TBA**

Dentists interact with physicians on a relatively regular basis as questions arise as to the medical management of patients under their care. This course provides opportunities to learn more about and discuss the impact of the medical conditions on dental treatment, and the interaction between dentists and physicians.

**BD&SS 548.2
Diagnosis/Oral Medicine and CPRC's
1(1L-3C), 2(3C)**

Various oral medicine topics are covered, including the management of oral lesions, radiation therapy and chemotherapy patients, patients with salivary disorders and patients with infectious diseases. In addition, students participate in multi-disciplinary seminars to gain experience in applying previous knowledge to simulated clinical patient cases (CPRC's). Students also perform dental emergency procedures and diagnosis and treatment planning under faculty guidance in the emergency, diagnosis and oral medicine/oral pathology clinics.

**BD&SS 563.4
Advanced Oral and Maxillofacial
Surgery
1&2(1L-3C)**

A continuation of BD&SS 463 and covers more advanced topics in oral and maxillofacial surgery. Subjects discussed include: preprosthetic surgery, orthognathic surgery, TMJ surgery, head and neck

cancer surgery, the surgical treatment of patients with cleft lip and palate deformities, and maxillofacial traumatology. In the oral surgery clinic students are given more opportunity to develop expertise in minor oral surgery.

BD&SS 573.2
Medical Emergencies in the Dental Office
2(1L)

This course is devoted to the prevention, recognition and management of medical emergencies in the dental office. Various types of emergencies such as chest pain, respiratory difficulties and altered consciousness are covered. The equipment and drugs necessary to manage common medical emergencies are discussed. The laboratory component is a review of basic CPR.

FIVE YEAR D.M.D. PROGRAM

BD&SS 602.2 (Formerly D&S S 602)
Oral Radiology
1(3C)

A continuation of the clinical component of BD&SS 402. Students are evaluated on their ability to select an appropriate series of intra-oral radiographs for a given patient, take these radiographs, and interpret them. In addition, students are expected to write interpretations on selected assigned cases.

BD&SS 603.2 (Formerly D&S S 603)
Advanced Oral and Maxillofacial Surgery and Management of Medical Emergencies
1(1L-3C)

A continuation of BD&SS 503. More specialized topics in oral and maxillofacial surgery such as orthognathic surgery and temporomandibular joint surgery are covered. A major part is devoted to the management of medical emergencies in the dental office. Clinical experience continues with more advanced patient management in order to develop competence in routine minor oral surgery.

BD&SS 606.2 (Formerly O BIO 606)
Special Topics in Oral Biology
1(1L)

The relevance of the basic sciences to clinical dentistry. The scientific bases of various aspects of clinical dentistry are examined in detail.

BD&SS 609.2 (Formerly D&S S 609)
Periodontics
1(1L-4C)

Student clinical experience as group leaders is continued. Students present seminars based on case presentations of patients being treated in the clinic.

BD&SS 612.2 (Formerly D&S S 612)
Diagnosis
1(1L-3C)

Students participate in a multidisciplinary seminar to gain experience in applying previous knowledge to clinical patient cases. Clinical experience is given in diagnosis, treatment planning, and emergency procedures under the guidance of the college faculty in the diagnosis, emergency, and oral medicine/oral pathology clinics.

BIOLOGY

Department of Biology, College of Arts & Science

BIOL 105.3
An Introduction to Human Genetics
1S(3L-3P)

Prerequisite(s): Biology 30, with a laboratory or BIOL 107 or 108; and Chemistry 30.

Underlying mechanisms of human heredity are developed to allow an understanding of the inheritance and biotechnical manipulation of human genetic traits.

Topics include Mendelian inheritance, cytogenetics, polygenic inheritance, population genetics and molecular genetics. The genetic basis of metabolic disease and the influence of mutagens, carcinogens and teratogens are discussed. Closing lectures deal with the application, legality and morality of genetic knowledge and technology.

Note: Students with credit for BIOL 211 may not take this course for credit. This course is offered only at Spring and Summer Session or as an Independent Study course in the Regular Session.

BIOL 107.6
The Living Earth
1&2(3L-1.5T)

Includes geological, biological and ecological studies. It considers the history of the earth and the forces which shape its changing surface, the nature of life and the requirements for life on the earth, heredity and evolution including the record of life preserved in the rocks, organism diversity, and the effects of people on the environment. The lectures will be supplemented by outside reading and by small-group tutorial and demonstration sessions.

Note: Students with credit for BIOSC 100 or 101 may not take this course for credit. Students who have taken Biology 30 (Grade XII Biology) may not take both BIOL 107 and BIOL 110 for credit. BIOL 107 is recommended for students in Program Types A, B and D. This course is not acceptable under requirement 1 of Program Type C. Students with credit for GEOL 205 or 206 may not take this course for credit.

BIOL 108.6
The Living Earth
1&2(3L-3P)

Follows the same lectures as BIOL 107 but has a three-hour laboratory each week. Designed for College of Education students in the Elementary Program. There will be a Physical Sciences/ Biological Sciences laboratory devoted to an integrated approach to the environment, using techniques from Physics, Chemistry, Biology and Geology. This laboratory is equivalent to a three-hour practicum.

Note: Students with credit for BIOSC 100 or 101 may not take this course for credit. Students who have taken Biology 30 (Grade XII Biology) may not take both BIOL 108 and BIOL 110 for credit. Students with credit for GEOL 205 or 206 may not take this course for credit.

BIOL 110.6
General Biology
1&2(3L-3P)

Prerequisite(s): Biology 30 with a laboratory, or BIOL 107 or 108. Chemistry 30 is required for registration in a biology major and strongly recommended for other students registering in BIOL 110.

Deals with the general principles of biology and is based on a good previous preparatory course. This course is a prerequisite for senior courses in biology.

Note: Students in Program Types A, B and D should consider BIOL 107 as an alternative to BIOL 110.

BIOL 202.3
Botany
1(3L-4P)

Prerequisite(s): BIOL 110.

Deals in some depth with selected aspects of botany: structure, development and taxonomy of vascular plants.

Note: Students may not take both BIOL 202 and 205 for credit. Intended primarily for agriculture students.

BIOL 203.6
Animal Structure and Function
1&2(1L-6P)

Prerequisite(s): BIOL 110.

Surveys the structure, function, and evolution of the major groups of vertebrate and invertebrate animals.

BIOL 204.3
A Survey of Bacteria, Algae and Fungi
1(3L-4P)

Prerequisite(s): BIOL 110; CHEM 112.

Surveys the structure, function and evolution of the bacteria, algae and fungi.

Note: Intended primarily for majors in biology, plant sciences and education.

BIOL 205.3
A Survey of the Land Plants
2(3L-4P)

Prerequisite(s): BIOL 110.

Surveys the structure, function and evolution of the Bryophytes and Tracheophytes.

Note: Students may not take both BIOL 202 and 205 for credit. Intended primarily for majors in biology, plant ecology and education.

BIOL 211.3
Genetics
1/2(3L-2P-1T)

Prerequisite(s): BIOL 107 or 108 or 110.

Theory and problem solving are given in transmission genetics, cytogenetics, molecular genetics, gene regulation, and behavioral genetics. Laboratory exercises include bench experiments and assistance in problem solving.

Note: Students with credit for BIOL 105 will not receive credit for BIOL 211.

BIOL 217.3
Introductory Animal Physiology
1(3L-4P)

Prerequisite(s): BIOL 110; CHEM 112 and 115; also recommended PHYS 111.

An introduction to physiological principles. It includes consideration of physical, chemical and functional aspects of animal cells, study of membranes, cellular transport and extrusion mechanisms.

Bioelectric and contractility phenomena are also included.

Note: Students with credit for PHSIO 212 will not receive credit for BIOL 217.

BIOL 218.3
Comparative Systems Physiology
2(3L-4P)

Prerequisite(s): BIOL 217.

An introduction to the function of organ systems in animals. It includes study of cardiovascular, digestive, osmoregulatory, respiratory, and endocrine and nervous systems. Examples are drawn from vertebrate and invertebrate models.

Note: Students with credit for PHSIO 212 will not receive credit for BIOL 218.

BIOL 253.3
Ecosystems
1(3L-4P)

Prerequisite(s): BIOL 107 or 108 or 110 or GEOG 111 and 112 or 113 and 114 or 6 credit units in geology.

An introduction to aquatic and terrestrial ecosystems, with emphasis on western Canadian biomes and ecosystems. Community structure and dynamics, ecosystem production, energy flow and material cycling will also be considered.

Note: Students with credit for PL SC 213 will not receive credit for BIOL 253.

BIOL 263.3
Introduction to Population Biology
2(3L-4P)

Prerequisite(s): BIOL 110.

An introduction to the major topics of population genetics, population ecology and animal behaviour, integrated by using an evolutionary theme. Quantitative theory and mathematical models will be used.

BIOL 316.3
Molecular Genetics of Eukaryotes
2(3L-3P)

Prerequisite(s): BIOL 211.

Includes structure and mapping of the eukaryotic chromosome, cytoplasmic inheritance, recombinant DNA technology, mutation, recombination, gene regulation in eukaryotes, developmental genetics, oncogenetics, immunogenetics and evolutionary genetics. Laboratories involve computer exercises based on genome data bases.

BIOL 323.3
Taxonomy of Vascular Plants
1(3L-4P)

Prerequisite(s): BIOL 202 or 205.

Introduces the principles and methods of plant systematics: classification; description; nomenclature; identification of vascular plants; taxonomic characters; species and speciation; and tempos and patterns of plant evolution. Students are expected to make a collection of no more than 40 species of vascular plants and should contact the Department of Biology in the Spring for details.

BIOL 324.3
Plants and Human Affairs
1(3L-2P)

Prerequisite(s): BIOL 107 or 110 or permission of department and completion of 60 credit units at the university.

A consideration of the higher or vascular plants which are economically important;

their origins, history and botanical relationships and their fundamental role in all human societies.

**BIOL 325.3
Plant Cells and Tissues
2(3L-4P)**

Prerequisite(s): BIOL 202 or 205.
A structural and functional study of the organization of the vascular plant body. The course deals with plant cell organelles, cell types and basic tissue organization. Examination of live material is emphasized in the laboratory.

**BIOL 326.3
Plant Development
1(3L-4P)**

Prerequisite(s): BIOL 202 or 205.
A survey of developmental phenomena in plants including the experimental approach to the interpretation of morphogenesis. Emphasis will be placed upon the vascular plants, but examples drawn from other groups will be used for comparison and clarification where appropriate.

**BIOL 331.3
Introductory Plant Physiology
2(3L-4P)**

Prerequisite(s): BIOL 202 or 205.
Three sections which deal respectively with plant cell physiology, the physiology of the whole plant and the physiology of plant growth and morphogenesis.

**BIOL 342.3
Mycology
2(3L-4P)**

Prerequisite(s): BIOL 204.
Fungi have essential ecological interactions with the roots of 80% of terrestrial plant species, support ancient and modern forms of biotechnology, and recycle the vast majority of plant material. They are also amongst the most serious of pathogens and storage rots. This course examines the relationship between fungal cell biology and development, reproductive and genetic strategies, symbioses, and industrial and biotechnology applications in this diverse and successful group.

**BIOL 345.3
Introductory Plant Pathology
1(3L-4P)**

Prerequisite(s): BIOL 202 or 205.
A survey of the biology of the major groups of plant pathogens and of the major types of plant diseases with emphasis on symptoms, transmission and control. Approximately equal emphasis is placed on theory and on laboratory work.

**BIOL 350.3
Honours Field Course
1(7P)**

Prerequisite(s): BIOL 203, 204, and either 205 or 202.
An introduction to the principles and methods of field biology with an emphasis on the ecological relationships of organisms.
Note: Restricted to honours or prospective honours students. Required for honours students in biology. It is recommended that it be taken after completing the third year of courses.

**BIOL 352.3
Comparative Embryology
2(3L-4P)**

Prerequisite(s): BIOL 203.
A comparative survey of animal embryology with emphasis on morphogenesis, histogenesis and developmental mechanisms in vertebrates and selected invertebrates including insects. Live embryos of various types and a variety of sectioned material will be examined in the laboratory.

**BIOL 361.3
Vertebrate Biology
3L/4P**

Prerequisite(s): BIOL 203.
An introduction to the biology of fishes, amphibians, reptiles, birds and mammals. The course will consist of a brief phylogenetic survey and an examination of the evolution of different vertebrate body systems. Emphasis will be placed on comparative morphology, embryology and physiology.
Note: Students with credit fro BIOL 351.6 may not take this course for credit.

**BIOL 364.3
Economic Entomology
2(3L-4P)**

Prerequisite(s): BIOL 110.
Emphasizes the ecological aspects of economic entomology. Includes a laboratory and lecture survey of economically important arthropods, a consideration of the principles of pest control and discussion of pesticides.

**BIOL 365.3
Insect Diversity and Evolution
1(3L-4P)**

Prerequisite(s): BIOL 203.
Surveys insects and their close relatives based on morphology and taxonomy. Focuses on insect natural history, comparative anatomy and classification. Representative types examined in the laboratory provide an understanding of current trends in insect taxonomy and phylogeny.

**BIOL 366.3
Insect Structure and Function
2(3L-4P)**

Prerequisite(s): BIOL 203 and 217.
Introduction to structure and function in insects. Topics are the integument, sensory systems, nervous and chemical coordination, gaseous exchange, food intake and utilization, metabolism, haemolymph and circulation, excretion, osmoregulation, reproduction, growth, and development. Comparisons with vertebrate physiological systems are made as appropriate.

**BIOL 367.3
Lower Invertebrate Structure and Function
1/2(3L-4P)**

Prerequisite(s): BIOL 203.
Studies functional morphology of lower invertebrate animals. Laboratories investigate the physiology of invertebrates.

**BIOL 368.3
Higher Invertebrate Structure and Function
1/2(3L-4P)**

Prerequisite(s): BIOL 203.

A study of the functional morphology of higher invertebrate animals. Laboratories investigate the physiology of invertebrates.

**BIOL 401.3
Evolutionary Biology
1(3L-1T)**

Prerequisite(s): BIOL 211 and 263.
Includes speciation and its consequences, hybridization and introgression, aspects of population genetics significant in evolutionary theory, rates of evolution and evidences for evolution. The evolution of specific groups will be considered in detail.

**BIOL 414.3
Perspectives in Biology
1&2(1.5S)**

Prerequisite(s): Must be in Biology Honours Program or have permission of the department.
Assigned reading and tutorials. Students will be required to write a series of essays on assigned topics.
Note: Honours students in biology in their fourth year must take this course.

**BIOL 420.3
Molecular Biology of Plants
1(3L-4P)**

Prerequisite(s): BIOL 205 and one of BIOL 316 or BIOCH 230 or permission of the instructor.
A study of the molecular biology of plants; plastid genomes, coordination of expression between nuclear and plastid genomes, environmental and hormonal effects on gene expression and genetic engineering of plants.

**BIOL 422.3
Phycology
2(3L-4P)**

Prerequisite(s): BIOL 204.
Ecology, morphology, physiology and taxonomy of algae with emphasis on freshwater forms.

**BIOL 424.3
Grasses and Grasslands
2(3L-4P)**

Prerequisite(s): BIOL 202 or 205.
A study of the morphology, systematics, biogeography, synecology and autecology of the grasses and other graminoids, and ecology of grasslands. Laboratory emphasis is on the structure and taxonomy of grasses.

**BIOL 436.3
Animal Parasitology
1(3L-3P)**

Prerequisite(s): 60 credit units at the university and permission of the department.
Deals with helminths, arthropods and protozoa of people, domestic and wild animals, and birds. Examples from these parasite and host types will be used to illustrate important concepts, including basic structure and function, life cycles, ecology, biogeography, individual and population level host-parasite-environment relationships, epizootiology and parasite control strategies.

**BIOL 451.3
Ichthyology
1(3L-4P)**

Prerequisite(s): BIOL 203 or 351.
The biology of fishes including their morphological diversity, physiology, behaviour and ecology, and their management and utilization. Students enrolled in this course are expected to make a collection of at least 14 species of fish. Collections can be completed during the course.

**BIOL 455.3
Mammalogy
2(3L-4P)**

Prerequisite(s): BIOL 203 or 351.
Introduction to local and world mammal faunas. Evolution, behaviour, ecology, morphology, phylogeny, and physiology will be emphasized in lectures. Laboratories will be concerned with taxonomic classification, identification, and anatomical adaptations.

**BIOL 458.3
Ornithology
1(3L-4P)**

Prerequisite(s): BIOL 203 or 351.
Introduction to the diversity of birds of the world. Lecture material focuses on evolution, ecology, behaviour, physiology and conservation. Laboratories focus on morphological diversity and taxonomy.

**BIOL 466.3
Aquatic Insects
1(3L-4P)**

Prerequisite(s): BIOL 203.
Identification of aquatic insects, discussions of current literature, field trips, collections, and laboratory work.
Note: Students are advised to contact the instructor about making a collection of insects the summer before enrolling in the course.

**BIOL 470.3 Conservation Biology
3L/4P**

Prerequisites: BIOL 253.3 and 263.3, or permission of the instructor.
An introduction to the theoretical and scientific foundation of conservation biology as applied to animals and plants. Course material will cover elements of population, community and landscape ecology as they apply to conservation challenges. Labs will include measuring biodiversity and analysis of current conservation issues. Field trips are required.
Note: There will be costs for a field trip in addition to tuition fees.

**BIOL 472.3
Animal Behaviour
2(3L-4P)**

Prerequisite(s): BIOL 263.
Fundamental concepts in animal behaviour. An introduction to the form, control and adaptive significance of animal behaviour.

**BIOL 473.3
Population Ecology
1(3L-4P)**

Prerequisite(s): BIOL 263 and a course in statistics.
The theory of population growth, distribution and abundance of organisms.

BIOL 474.3
An Introduction to Quantitative Biology
2(3L-4P)

Prerequisite(s): MATH 110, and 112 or 116, PL SC 314 or STATS 245 or 246, and 18 credit units in biology.

Introduces the student to quantitative methods, as applied to biological problems. Lectures emphasize the theoretical basis of the methods while laboratory time is used for the solution of concrete examples chosen from a variety of biological disciplines.

BIOL 475.3
Ecological Toxicology
1/2 (3L-3P)

Prerequisites: BIOL 110.6 or equivalent, BIOL 253.3 or equivalent, and 3 credit units in statistics (e.g., PL SC 314.3). BIOL 263.3 and TOX 301.3 are recommended.

An introduction to the principles of ecological toxicology, including: population modelling, experimental design and interpretation of field studies, and contaminant impact assessment on populations, communities and ecosystems. Computer laboratory exercises will be used to model populations and ecosystems and analyze changes in populations resulting from contaminant impacts.

BIOL 480.3
Biology Research
1/2(6P)

Prerequisite(s): Restricted to fourth year biology students with a cumulative weighted average of 70% or better.

The student will work on a laboratory or field project under the supervision of a faculty member. Before beginning, the student must obtain a supervisor and then submit an outline of the project for approval by the Head of the Department. At the end of the project, the student will submit to the department a written report in thesis form.

Note: Honours Agriculture Biology students may not take both this course and AGRIC 494. Those in College Scholar Programs may not take this course in addition to another laboratory or field project designed under the Program.

SPECIAL TOPICS

These courses are offered occasionally in the College of Arts & Science by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

- BIOL 398.3 1/2(3S)
- BIOL 399.6 1&2(3S)
- BIOL 498.3 1/2(3S)
- BIOL 499.6 1&2(3S)

GRADUATE COURSES

Department of Biology, College of Graduate Studies & Research

BIOL 811.3
Cell Biology
1&2(1.5S)

Prerequisite(s): Permission of the department.

Review of the literature on selected topics including microscopic and sub-microscopic cellular organization, and cell function.

BIOL 815.3
Advanced Limnology
1/2(3S)

Prerequisite(s): BIOL 315.

Deals with limnological problems such as: planktonology, productivity, biocides, and regulation of aquatic populations.

BIOL 825.3
Current Topics in Plant Molecular Biology
2(1S-4R)

Prerequisite(s): BIOL 420 or PL SC 416; or permission of the instructor.

A review of recent advances in plant molecular biology, emphasizing the use of molecular techniques in studying basic plant processes. Where appropriate, the impact of such research on plant biotechnology will be discussed.

BIOL 827.3
Multivariate Methods in Taxonomy and Ecology
1&2(2S-4P)

Prerequisite(s): An introductory statistics course; a course in computer science, any two of BIOL 423, 472, 473, PL EC 431; or permission of the instructor.

An introduction to numerical taxonomy and quantitative phytosociology, covering estimates of resemblance, classification and ordination procedures.

BIOL 832.3
Control of Plant Growth and Development
1/2(1L-1S-4R)

Prerequisite(s): Satisfactory knowledge of plant structure and development, biochemistry and physiology. Permission of the instructor.

Deals with problems of growth, differentiation and morphogenesis in plants examined at the genetic, cellular and organismic levels.

BIOL 835.3
Genetic Approaches to Plant Physiology
1(3L)

Prerequisite(s): Satisfactory knowledge of plant physiology, biochemistry and genetics. Permission of the instructor.

Deals with case studies to illustrate the use of genetic mutants and variants to investigate plant physiological processes.

BIOL 841.3
Advanced Plant Pathology
2(2L-2S-2P)

Prerequisite(s): Permission of the instructor.

Selected topics in plant pathology and related aspects of applied biology.

BIOL 871.3
Advanced Insect Physiology
1/2(4L-2T)

Prerequisite(s): BIOL 365, 366; or permission of the instructor.

A review of recent advances in certain fields of insect physiology.

BIOL 872.3
Advanced Animal Behaviour
1/2(3S)

Prerequisite(s): BIOL 472.

Examination of current concepts and techniques in the study of animal behaviour.

BIOL 880.3
Applied Statistics in Ecology
1/2(3L)

Prerequisite(s): PL SC 314 or equivalent.

An overview of basic statistical methods and their applications to ecological studies. Topics include descriptive statistics, frequency analyses, experimental designs and analyses of variance, trend analyses, and analyses by rank. Designed for students involved in ecological research.

BIOL 883.3
Ecology Seminar
2(2S)

Students and faculty reports on selected topics in aquatic and terrestrial ecology.

BIOL 889.3
Avian Wildlife Conservation and Management: Theory in Practice
2(2L-1P)

Prerequisite(s): BIOL 458 or 473; or equivalent.

Evaluates current problems and solutions in conservation and management of wildlife, primarily birds, with emphasis on hypothesis-testing, and identification, review and application of ecological theories and new analytical techniques. Analysis of specific case-histories dealing with management of birds.

BIOL 898.3
Special Topics
1/2 or 1&2 (R/T)

Assigned reading and tutorials, projects and/or lectures in special topics related to the student's major field of interest. Students are required to prepare three essays or term papers or their equivalent if another form of evaluation is more appropriate.

BIOL 990
Seminars

A student seminar/poster symposium held over one day during the regular session to develop scientific communication skills. Both M.Sc. and Ph.D. students are required to participate in and pass this course for two years.

BIOL 994
Research

Students writing a Master's thesis must register for this course.

BIOL 996
Research

Students writing a Ph.D. thesis must register for this course.

BIOMEDICAL ENGINEERING

Department of Biomedical Engineering, College of Graduate Studies & Research

GRADUATE COURSES

BIO E 800.3
Advanced Biomedical Instrumentation
1/2(3L-1.5L)

An introduction to some of the concepts of instrumentation and their application to measurements of biological parameters. Includes: transducers, biopotential amplifiers, electrodes, biopotential signals, electrical safety, cardiovascular and respiratory measurements, and imaging.

BIO E 802.3
Fundamentals of Signals Theory for Life Scientists
1/2(3L)

Signals and spectra. Bandwidth requirements. Amplitude and phase distortion. Time delay considerations. The sampling theorem. The sampling of non-periodic wave shapes. White noise. Signal to noise ratio.

BIO E 804.3
Biomaterials
2(3L)

An introduction to the structure and physical properties of materials of importance in bioengineering; compatibility of materials with the body; mechanisms of damage and failure of implanted materials; materials selected and fabrication.

BIO E 898.3
Special Topics
1/2(3L)

Two 3 credit-unit courses can be taken independently. Topics will be selected according to the student's specific areas of interest. They include signal analysis for the acquisition and processing of physiological data, digital and optical picture processing for medical applications, theory of bioelectrodes, biological control theory and computer simulations of biological processes (some of these topics may be presented by faculty members specializing in that particular field).

BIO E 990
Seminar

Seminars are held periodically throughout the Regular Session or as a one-day symposium. Graduate students are required to make a presentation related to their thesis work or on a course project. In addition, graduate students may be required, from time to time, to attend seminars relevant to biomedical engineering given by faculty or visiting scientists in other departments. Students must enroll throughout their program.

BIO E 992.6
Project

Students taking the project Master's degree must register in this course.

BIO E 994
Research

Students writing a Master's thesis must register for this course.

BIO E 996
Research

Students writing a Ph.D. thesis must register for this course.

BIOTECHNOLOGY

Virtual College of Biotechnology

For details on undergraduate programs in Biotechnology see the following programs in the College of Arts & Science section of the Calendar:

- Anatomy & Cell Biology
- Biochemistry
- Biology
- Microbiology
- Sociology

**BTECH 200.3
Introduction to the Science of
Biotechnology
1/2(3L)**

Prerequisite: Biology 30 or BIOL 107 plus completion of 30 credit units at the university; no 200-level life science course (except CHEM 251.3) without permission of the instructor.

The course will focus on those aspects of scientific knowledge that will allow students to understand basic biological concepts as related to biotechnology. Relevant examples from agricultural and medical biotechnology will be used to illustrate and introduce these scientific principles. This course is designed specifically for non-life science students.

Note: Students whose programme requires them to take either BIOL 211.3 or BIOCH 200.3 are not allowed to take BTECH 200.3, 300.3 or 400.3 for credit.

**BTECH 300.3
Techniques and Approaches in
Biotechnology
1/2(3L/2T)**

Prerequisite: BTECH 200.

This course will build upon BTECH 200 and will cover techniques and approaches. A major objective is the introduction of biotechnology terminology as well as an appreciation for the variety of research approaches used in modern biotechnology and related disciplines. This course is designed specifically for non-life science students.

**BTECH 400.3
Applications and Uses of
Biotechnology
1/2(2L/1P)**

Prerequisite: BTECH 300.

Interactive visits to local biotechnology companies to view the scientific operations, the production and the scale up of the final product. Pre-visit lectures will review the appropriate concepts from BTECH 200 and 300. Post-visit sessions will discuss how the science has been applied. This course is designed specifically for non-life science students.

BIOTECHNOLOGY MANAGEMENT

Department of Marketing, College of Commerce

**BTMGT 400.6
Honours Seminar in Biotechnology
Management
1&2(3S)**

Directed readings and individual research in the area of Biotechnology Management. The major course requirement involves the preparation of an honours research paper under the supervision of one or more faculty - Honours Advisor(s) - in the particular area of specialization. The resulting honours paper is normally presented at a department seminar.

BUSINESS ADMINISTRATION

Department of Business Administration, College of Graduate Studies & Research

GRADUATE COURSES

**MBA 710.3
Financial Accounting
1(3L)**

The principles and fundamentals of accounting theory and practice. Accounting measurements and the use of accounting data. The preparation of business records and financial statements. An examination of the alternatives available in the measurement of income, assets, liabilities and owners' equity for external financial reporting.

**MBA 720.3
Organizational Behaviour
1(3L)**

Introductory examination of the behaviour of work organizations and the groups and individuals within them. Topics include schools of management thought, organizational structure, work motivation, perception, decision-making, job satisfaction, work performance, group processes and leadership. Provides a knowledge base upon which advanced organizational behaviour courses are built.

**MBA 730.3
Industrial Relations
1(3L)**

Considers the administrative problems involved in the staffing of producing organizations. The central theoretical considerations will be the relative power relations that exist between the individual and the organization in the context of a labour market and the relative power that exists between different kinds of organizations in Western society. Involves an introductory discussion on the labour force and the labour market - basic concepts and trends; employee placement and compensation - the employment bargain; labour-management relations - the basis of conflict and conflict resolution.

**MBA 740.3
Quantitative Methods for
Management
1(3L)**

Prerequisite(s): Admission to the M.B.A. program; Courses in Mathematics for Business Applications and Descriptive Statistics.

Orients the students to concepts, techniques and applications of both statistical and operations research methods to problems of data analysis and managerial decision-making.

**MBA 750.3
Economic Environment of Business
1(3L)**

Prerequisite(s): Introductory course in microeconomics; Admission to the M.B.A. program.

Examines the overall macroeconomic environment facing business firms, with some attention devoted to the feedback between business firms and the environment itself. Broadens and enhances the student's "toolkit." Pays close attention to the direct implications to business firms of particular environments and policies of the day including the interaction between business policy and the economy.

**MBA 802.3
Management Accounting
2(3L)**

Prerequisite(s): MBA 710.

The role of accounting and analysis as an aid to managerial planning and control. Basic cost concepts, cost compilations, and accounting techniques for product costing, budgetary planning and control, and special decisions.

**MBA 804.3
Marketing Management
1(3L)**

Designed for students with a limited background in marketing. Provides an overview of the nature and scope of marketing activities in the modern business firm. Specific topics include: consumer behaviour, product policy, pricing, promotion, channels of distribution, and marketing research.

**MBA 806.3
Financial Management
2(3L)**

Prerequisite(s): MBA 710.

Asset selection, capital structure, and growth policies for the business firm. Some applications of these policies to government-owned institutions.

**MBA 808.3
Managerial Economics
2(3L)**

Prerequisite(s): MBA 750; completion of three 700-level MBA courses.

Coverage of tools and concepts in microeconomics relevant to managerial decision making. Emphasizes both theoretical and empirical contributions in the managerial economics literature with applications to the estimation of demand and product in functions, partial equilibrium in competitive and non-competitive markets, risk analysis and intertemporal analysis.

**MBA 810.3
Production and Operations
Management
2(3L)**

Prerequisite(s): MBA 740; completion of three 700-level MBA courses.

A systems oriented view of the operations and production management, dealing with methods used for planning, organization, scheduling and controlling of operations in both industry and other institutional settings. The emphasis is on the concepts, analytical tools and techniques of specific topics such as process and product design, capacity planning, facility location, facility layout, operating scheduling, forecasting, inventory control and performance control.

**MBA 811.3
Corporate Financial Reporting
1/2(3L)**

Prerequisite(s): MBA 710 and 802.

Focuses on the process of interpretation and the uses to be made of financial statements. Approached from a user point of view - what should be known about financial statements and financial measurements which will influence user decisions. By reference to corporate financial reporting, the existing traditional model and the proposed current valuation models will be exposed - together with the

various social uses to which financial statements are addressed.

**MBA 812.3
Accounting Aspects of Management
Planning and Control Systems
1/2(3S)**

Prerequisite(s): MBA 710 and 802.

Focuses on the financial and behavioral implications of the management planning and control systems in business enterprises. Topics include the nature and purpose of planning and control systems; the budgetary control process; management accounting subsystems; financial performance measurement through profit, investment and cost centres.

**MBA 814.3
Business Law
1/2(1L-2S)**

Provides the student with an understanding and appreciation of the nature of the legal process, the role of the courts and other tribunals in the administration of justice, and the basic rights and obligations of individuals (and firms) in contract, tort and under the criminal law.

**MBA 815.3
Management in Contemporary
Aboriginal Organizations
1/2(3L)**

Prerequisite(s): MBA 720; or permission of the Director.

This course will examine Aboriginal cultures to assist the student in understanding the different values and world views that survive in aboriginal communities and their relevance to the resolution of contemporary problems. Similarities, differences and ethical considerations in management structures will be compared with corporate management and public models of self-government.

**MBA 816.3
Contemporary Issues in Aboriginal
Business
1/2(3L)**

Prerequisite(s): Permission of the Director.

This course will confront selected business and management issues in contemporary Aboriginal society. Students will gain an appreciation for the relationship law, business and economics play in shaping community development. Appropriate criteria for examining the themes or issues will be developed as well as methods for discussing and debating these issues.

**MBA 817.3
Indigenous People and Economic
Development
1/2(3L)**

Prerequisite(s): Permission of the Director.

This course will survey the approaches to economic development by the Indigenous Peoples of the world, particularly those in Canada. These contemporary approaches, strategies and practices will be examined in relation to current and emerging theories of development and underdevelopment in the "new global economy."

**MBA 818.3
Aboriginal Management Systems
1/2(3L)**

Prerequisite(s): Permission of the Director.

Students examine various approaches to development in Aboriginal Nations' communities undertaken by economic development corporations, government agencies, research and planning groups, Aboriginal organizations and individual entrepreneurs. The focus is on management strategies but will consider the impact of various strategies on community issues such as education, health and justice.

**MBA 826.3
Taxation and Business Decisions
1/2 (3S)**

Prerequisite(s): MBA 710 and MBA 802.

This is an advanced seminar course dealing with the historical development of taxation, current developments in tax legislation, tax factors in business, and other topics related to the tax implications of business decisions.

**MBA 827.3
Contemporary Moral and Social
Issues in Business
1/2(3S)**

Analysis of ethical and social problems in business as described in readings, cases, and videos, and discussion of various societal trends which have an impact on business management. Topics include downsizing, excess profits, privacy, equity in pay and benefits, whistle-blowing, government regulation (e.g. banning tobacco ads), environmental protection, etc.

**MBA 828.3
Business Policy and Strategy
1(3S)**

Prerequisite(s): All MBA 700-level courses and at least four courses numbered 800-825. Attempts to develop an understanding of the processes of policy formulation and implementation in the environmental setting in which they are made; to demonstrate the relevance of certain approaches and tools to the analysis and solution of business policy problems in real life situations; and to deal with the total organization and integrate various functional areas in making business policy decisions.

**MBA 830.3
Management Simulation
1/2(2P-1L)**

Prerequisite(s): All MBA 700-level courses and at least four courses numbered 800-825.

A capstone course designed to reinforce basic management skills and provide an action frame of reference for applying preceding functional and tool courses using a variety of methods.

**MBA 832.3
Management Information Systems
1/2(3L)**

Prerequisite(s): All MBA 700-level courses and at least four courses numbered 800-825.

Problems in the implementation of modern computer-based management information systems. Provides an overview of the principal types of software support and concentrates on managerial problems in the selection and control of projects, and policy issues in the selection of a systems philosophy for the organization.

**MBA 840.3
Power and Politics in Work
Organizations
1/2(3S)**

Familiarizes one with organizational power politics by: 1) developing an awareness of the reality and importance of the phenomena; 2) discussing a selection of power tactics; and 3) pointing out the necessity for introspection and the development of a personal system of managerial values or ethics.

**MBA 842.3
Organizational Design and Change
1/2(1.5L-.75P-.75S)**

Organizational structures and intra-organizational patterns of relationships provide the focus for this course, which is intended to prepare students for the exposure they will confront in their early years in most organizations. The second part of the course emphasizes tactics and strategies for introducing modifications in organizations.

**MBA 843.3
Administrative Behaviour
1/2(3S)**

The role of the administrator requires organizing, controlling, planning and motivating others to perform the work of an organization. However, the administrator is also a person with needs and career aspirations as well as responsibilities to a boss and subordinates. From the administrator's point of view, how does one survive the experience? Topics include leadership, evaluation, career issues, problem solving, stress and coping.

**MBA 846.3
Innovative Forms of Work Structures
1/2(3S)**

Critically examines a variety of non-traditional forms of work organization which are purported to address a variety of problems currently facing work organizations. These forms include job and task redesign, semi-autonomous work groups, participative management, joint consultation, joint decision-making through worker councils and board representation, and employee ownership.

**MBA 848.3
Management of International
Businesses
1/2(3S)**

Prerequisite(s): MBA 849; or written permission of the Director.

Identifies and analyzes key managerial policy issues within the context of an international corporation; discusses the means and problems of adapting to different environmental pressures. Involves overseas field study; field study fee applies. The College of Commerce places an emphasis on providing students with opportunities to study in an international setting. In the past students have been able to participate in internships and work study programs in Japan, Ukraine, and USA.

**MBA 849.3
International Business Environment
1/2(3L)**

Prerequisite(s): MBA 750.

A management course which analyzes the main environmental factors affecting the

operation and management of international business activities of the enterprise. Economic, legal-political, and cultural factors are examined, and their impact on managerial decisions in international business.

**MBA 856.3
Marketing In a Changing Environment
1/2(3S)**

Prerequisite(s): MBA 804.

Develops an understanding of the impact of changing environmental conditions upon the marketing activities of an organization. A primary focus is the development of the ability to adapt and rationalize various marketing principles, concepts and techniques.

**MBA 857.3
Advanced Marketing Management
1/2(3S)**

Prerequisite(s): MBA 804.

Provides the student with the opportunity to recognize, analyze, and formulate solutions to marketing problems encountered in the Canadian business environment. A decision-oriented approach is utilized to develop the student's ability to apply this knowledge of marketing in an integrated and logical manner.

**MBA 859.3
Venture Management
1/2(1.5L-1.5P)**

Venture Management is a general term used to describe the economic activity that deals with the initiation of new business endeavors. Included are such activities as the start-up of new companies or new subunits of large organizations, product development, and product-market expansion. Focuses on the processes and techniques required to convert ideas, inventions and innovation into profitable business undertakings.

**MBA 862.3
Financial Markets and Institutions
1/2(3L)**

Prerequisite(s): MBA 750 and 806.

Examines in depth the role and function of financial markets and financial intermediaries in Canada. Topics include: money and capital markets; objectives, functions and investment policies of financial institutions; interrelationships among financial institutions; performance, expansion and growth of financial institutions. Topics such as government regulation and international aspects of financial institutions will also be discussed.

**MBA 863.3
Advanced Financial Management
1/2(2L-1S)**

Prerequisite(s): MBA 750 and 806.

Focuses on the major and contemporary problems in corporate financial decision-making, thereby enabling the student to assume the role of decision-maker. Lectures, readings and case discussions will cover the topics dealing with financial problems of business investment decisions, liquidity management, major financial policies concerning dividends, growth and financial rehabilitation, as well as other contemporary financial issues and problems.

**MBA 866.3
Security Analysis and Portfolio
Management
1/2(2L-1S)**

Prerequisite(s): MBA 740, 750 and 806.

Deals with the determinants of investment values, investment risks and trade-offs between risk and return. It also considers securities markets, security analysis and valuation, portfolio selection, timing and management policies.

**MBA 870.3
Management of Computing Facilities
1/2(3L)**

This course surveys the managerial problems involved in the planning and management of computer systems. It discusses day-to-day issues in the management of computer facilities from the viewpoint of the managerial user. It provides a forum for discussing key policy issues versus service bureaus, centralized versus distributed computing, and the advantages of full cost allocation versus treatment of computer expense as overhead.

**MBA 881.3
Collective Bargaining
1/2 (2L-1S)**

Prerequisite: MBA 730.

This course analyzes various aspects of work relations as manifest with the context of union-management interaction. Emphasis is placed on the negotiation processes and major bargaining issues such as wages, fringe benefits, worker security and management prerogatives, and includes a general discussion of public policy towards the collective use of power.

**MBA 882.3
Human Resource Planning and
Policies
1/2(2L-1S)**

Prerequisite(s): MBA 730 and 808.

Application of various theories to the allocation of human resources within an organization and within the national economy. Major topics include human capital investment, the internal labour market, wage structures, allocative structures and human resource forecasting.

**MBA 885.3
Wage Administration
1/2(2S-1P)**

Prerequisite(s): MBA 730.

An introduction to the various aspects of compensation theory and practice. A brief general survey will cover such specialized fields as incentive systems, payment systems associated with performance appraisal, executive compensation, and various forms of wage discrimination. However, emphasis will be placed on a detailed study, through the extensive use of case data, of the various approaches to job evaluation systems, both quantitative and non-quantitative. Consideration will be given to the relationship between the internal wage structure and the market.

**MBA 886.3
Personnel Management
1/2(2L-1S)**

Prerequisite(s): MBA 720 and 730.
Beginning with a review of literature in the field of personnel administration, contemporary practice in the selection, placement and compensation of personnel will be studied.

**MBA 894.3
Applied Regression Analysis and Forecast
1/2(3L)**

Prerequisite: MBA 740.
The purpose of this course is to orient students in the development of linear regression and forecasting models. Topic areas include simple and general linear regression models, distributed lag and exponential smoothing models. Also covered are analysis of residuals, transformation of variables, weighted least squared method, and use of dummy variables. For larger problems demanding digital computational methods, use will be made of available computer regression and forecasting methods.

**MBA 895.3
Topics in Management Science
1/2(3L)**

Prerequisite(s): MBA 810.
Provides an intensive exposure to applications of management science (operations research) to particular problems. A combination of lectures, special readings, and execution of actual projects will give the students experience in making quantitative models operational in the decision process of an organization.

**MBA 898.3
Independent Readings and Study in Business Administration Topics
1/2(3T) or 1&2(1.5T)**

The student pursues an approved program of readings and study under the supervision of an individual faculty member. The subject should be other than those dealt with in listed MBA courses and must be approved by the relevant faculty member, the Department Head, and the program director.

**MBA 992.3
Project in Business Research Methodology
1/2(3S)**

This seminar is designed for M.B.A. students who have chosen not to write a thesis. After initial discussion of the literature on research methods, the seminar will focus on problems in areas of interest to the individual students. The emphasis will be placed on the writing of clear and suitable research proposals: format, organization of ideas, topical coverage, and appropriate survey of literature. Specific proposals in various stages of development will be the subject of discussion.

**MBA 994
Research**

Students undertaking research should register in this course each year until the Master's thesis is completed. This applies to work done extramurally and intramurally.

BUSINESS COMMUNICATIONS

Department of English, College of Arts & Science

This course is required for the B.COMM.

**BSCOM 100.3
Business Communication
2(3L)**

Prerequisite(s): 1 of ENG 111.3, 112.3, 113.3, or 114.3 or old 115.3.
Introduces effective styles and formats of business communications including memorandums, letters, reports, resumes, visual aids, and oral presentations. Each type of communication will be practiced. Common problems encountered by professors in the College of Commerce will be discussed.

First year students must choose one of ENG 111.3, 112.3, 113.3 or 114.3. This class must be taken in Term 1. Descriptions of these courses, can be found under English in this section of the *Calendar*.

CATHOLIC STUDIES

Department of Religious Studies, College of Arts & Science

Catholic Studies courses are not acceptable for credit in the College of Arts & Science.

Students who are planning to teach in a Separate School system are encouraged to take these courses as Separate School Boards often expect prospective teachers to have completed them. However, they are not acceptable in a Teaching Area I or II in Religious Studies.

**CTHST 105.3
Catholic Studies for Teachers 1
1/2(3L)**

Introduces students to the central, historical components of both Eastern and Western Catholic belief and identity, the Bible as revelation, the person of Jesus, and the nature of the Church.

**CTHST 106.3
Catholic Studies for Teachers 2
1/2(3L)**

Introduction to Eastern and Western Catholicism as a way of life, focusing on liturgical practice, personal morality in contemporary society, and corporate morality as related in Catholic teaching on social justice.

CHEMICAL ENGINEERING

Department of Chemical Engineering, College of Engineering

**CH E 210.3
Fluid Mechanics I
2(3L-2P Alt. weeks)**

Prerequisite(s): G E 125.
Corequisite(s): MATH 224.
Single phase fluid flow is considered for both gas and liquids. The mechanical energy balance and fluid force balance equations are developed with applications. Newtonian and non-Newtonian concepts are introduced including rheological measurement. The concepts of laminar and turbulent flow are developed and applied to

flow in pipes and networks, and fluid metering. Compressible fluid flow is also introduced.

**CH E 220.3
Introduction to Process Engineering
2(3L-1.5P)**

Corequisite(s): CHEM 242.
The lectures and problems will illustrate the use of energy and material balances in chemical and biochemical engineering processes.

**CH E 311.3
Mathematical Modelling I
1(3L-2P Alt. weeks)**

Prerequisite(s): MATH 224 (taken) and CH E 220.
Numerical methods. Curve-fitting and approximation of functions. Fourier series and integral. Laplace transformation. Design of experiments

**CH E 315.3
Mass Transfer I
2(3L-2P Alt. weeks)**

Prerequisite(s): CH E 311 and 323.
Mass transfer operations involving contact by stages, including single-stage, binary multiple-stage contacting, and multicomponent multiple-stage contacting. Gas absorption, distillation, and liquid extraction are included.

**CH E 320.3
Fluid Mechanics II
1(3L-2P Alt. weeks)**

Prerequisite(s): CH E 210.
Pumping of fluids, gas-liquid pipe flow, flow through consolidated and unconsolidated porous media, fluidization and two-phase separation processes. Applications include topics of interest in the petroleum and mineral processing industries.

**CH E 322.3
Mathematical Modelling II
2(3L-2P Alt. Weeks)**

Prerequisite(s): CH E 311.
Ordinary and partial differential equations as they relate to chemical engineering processes. Laplace transforms for ordinary differential equations. Analytic and numerical solutions to partial differential equations. An emphasis will be placed on the development of mathematical models for chemical engineering systems.

**CH E 323.3
Chemical Engineering Thermodynamics
1(3L-2P Alt. weeks)**

Prerequisite(s): CHEM 347.
Topics include the treatment of vapour-liquid equilibria at high pressures, expansion and compression of fluids, steam power-plant cycles, liquefaction of gases and refrigeration.

**CH E 324.3
Heat Transfer
2(3L-2P Alt. weeks)**

Prerequisite(s): CH E 210 (taken) and 311 (taken).
Steady and transient conduction. Convective transfer processes and heat transfer coefficients. Heat exchanger design. Radiant heat transfer.

**CH E 325.3
Process Engineering and Design I
2(3L)**

Prerequisite(s): CH E 220 and 323.
Corequisite(s): CH E 324.
The concepts of industrial chemical process design, industrial economics, process optimization, process simulation and plant troubleshooting. Encourages students to use their fundamental knowledge in science and mathematics to solve practical chemical engineering problems. Special emphasis will be placed on safety, hazards, operability and loss prevention issues in chemical plants.

**CH E 332.0
Seminar
1&2(1S)**

Current and future technological changes and their impacts on society are explored from a chemical engineering point of view. Impacts of petroleum production, mineral industries, and chemical industries.

**CH E 333.2
Chemical Engineering Laboratory I
2(3P)**

Corequisite(s): CH E 210 and 324.
A series of experiments using bench scale and pilot plant scale apparatus to study fluid mechanics, heat transfer, and thermodynamics. The method of reporting results is emphasized.

**CH E 411.3
Chemical Reaction Engineering
1(3L)**

Prerequisite(s): CHEM 242.
An examination of the principles of applied chemical kinetics and their use in chemical reactor design and chemical plant operation. Both homogeneous and heterogeneous kinetics, including catalysis, are considered.

**CH E 413.3
Process Dynamics
1(3L-2P Alt. weeks)**

Prerequisite(s): CH E 311 (starting 2002 CH E 322).
Simulations of chemical process control systems is introduced. Low order dynamic equations are developed. Nonparametric process identification is studied.

**CH E 414.2
Chemical Engineering Laboratory II
1(3P)**

Prerequisite(s): CH E 320 and 333 (taken).
Corequisite(s): CH E 413.
Experiments are chosen from the fields of fluid mechanics, biochemical engineering, heat transfer, thermodynamics, data logging and process dynamics.

**CH E 421.3
Mass Transfer II
1(3L-2P Alt. weeks)**

Prerequisite(s): CH E 315.
Further topics in mass transfer operations. Molecular diffusion, mass transfer coefficients, continuous contacting, gas absorption, air-water contacting, drying.

**CH E 422.6
Process Engineering and Design II
1&2(1.5P)**

Prerequisite(s): CH E 325

Corequisite(s): CH E 315 and 411.

Detailed design of an actual industrial chemical process including preparation of the engineering flow sheet, process simulation and optimization, plant energy and material balances, equipment sizing and design, plant layout, hazards and operability and environmental impacts, and economic analysis of the chemical process.

**CH E 423.3
Process Control
2(3L-2P Alt. weeks)**

Prerequisite(s): CH E 413.

The instrumentation and the distributed control systems will be discussed. The classical linear control theory and the stability criteria for control system design are introduced. The development of dynamic equations for elements of control loops is emphasized. Data acquisition, interfacing and digital computer control with emphasis on the analysis of sampled data systems are studied. Survey and discussion of particular control schemes for chemical engineering processes.

**CH E 424.2
Chemical Engineering Laboratory III
2(6P)**

Prerequisite(s): CH E 414 (taken) and CH E 421.

Corequisite(s): CH E 423.

Experiments are chosen from the fields of process dynamics and control, reactor design, and mass transfer.

**CH E 431.1
Seminar
1&2(1S)**

Corequisite(s): G E 300.

Current and future technological changes and their impacts on society are explored from a chemical engineering and a professional engineering point of view. Impacts of petroleum production, mineral industries, and chemical industries.

**CH E 453.3
Corrosion Engineering
1/2(3L)**

Prerequisite(s): 60 credit units of university study towards the B.E. degree.

Intended for engineers and others who wish to develop an appreciation of the principles of corrosion and corrosion control and their application to the selection of materials of construction and the protection of engineering systems.

**CH E 454.3
Design of Industrial Waste Treatment
Systems
1/2(3L)**

Prerequisite(s): 60 credit units of university study towards the B.E. degree.

Air pollution topics include causes and effects of air pollution, sampling and analysis of air and stack gas samples, stack gas dispersion models, and the design of industrial control measures for particulates. Water pollution topics include causes and effects of water pollution, biology of receiving waters and treatment systems, sampling and analysis of wastewaters, and

industrial control measures including biological methods such as trickling filters, aeration basins and activated sludge systems.

**CH E 460.3
Oil and Natural Gas Upgrading
1/2 (3L)**

Prerequisite(s): 70 credit units in CH E program including CH E 220.

The application of chemical engineering principles to the petroleum refining and petrochemical industries. A refinery survey looks at key unit operations such as atmospheric distillation catalytic cracking, and reforming. Bitumen and heavy oil upgrading are also discussed. Processes for the production of petrochemicals from natural gas constituents are examined.

**CH E 461.3
An Introduction to Biochemical
Engineering
1/2(3L)**

Prerequisite(s): 60 credit units of university study towards the B.E. degree.

To provide the engineering student with an understanding of the behaviour of microorganisms and their industrial application. The elements of organism structure, and enzyme and cell functions are discussed. Attention is given to the evaluation of batch and continuous fermentation processes and the operations of aeration, agitation and sterilization. Some industrial processes are considered.

**CH E 464.3
Petroleum Production Engineering
1/2(3L)**

Prerequisite(s): CH E 210 or C E 225 or G E 225 or ME 215.

An introduction to the techniques used in the production of oil and natural gas. Topics include an introduction to petroleum geology, properties of reservoir rocks and petroleum fluids, inflow performance of vertical and horizontal wells. Wellbore hydraulics, well testing and well stimulation.

**CH E 470.0
Field Trip
1/2(P)**

Visits to industrial plants.

Note: Offered in alternate years. Student must take the class in either third or fourth year.

**CH E 498.3
Special Topics**

These are courses offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the Dean's Office for further information.

GRADUATE COURSES

Department of Chemical Engineering,
College of Graduate Studies & Research

**CH E 861.3
Fundamental Biochemical
Engineering
1/2(3L-1P)**

The chemical engineer will learn the fundamentals of microorganisms and their uses in industrial situations. Metabolic regulations and biochemical reactions will be covered. Attention will be focused on

batch vs. continuous fermentations and the operations of aeration, mixing and sterilization.

Note: Students with credit for CH E 461 will not receive credit for this course.

**CH E 862.3
Advanced Biochemical Engineering
1/2(3L-1P)**

Prerequisite(s): CH E 461 or 861; or permission of the instructor.

Covers the most recent areas of research progress in biochemical engineering. Topics include novel bioreactors, large-scale cultivation of plant or mammalian cells, recombinant cell fermentations, novel systems and downstream processing techniques.

**CH E 873.3
Process Dynamics and Control
1/2(3L)**

Prerequisite(s): CH E 423; or equivalent.

Computer-controlled systems and mathematics of discrete-data systems will be introduced. Design of deterministic digital controllers of single-input, single-output and multi-input, multi-output processes in the z-domain and in the state-space domain will be studied. Off-line and on-line process identification techniques, using the time-series approach, will be investigated. Digital controllers for stochastic processes such as minimum-variance (MV) controllers, generalized MV controllers, and self-tuning controllers will be discussed. Computer aided design control system software packages will be used.

**CH E 874.3
Mass Transfer
1/2(3L)**

Advanced topics in mass transfer: theoretical models, absorption with simultaneous chemical reaction, with design of a packed column for absorption with reaction.

**CH E 875.3
Reaction Kinetics and Reactor Design
1/2(3L)**

Topics will include: Heterogeneous catalysis, non-ideal flow through reactors, non-catalytic gas-solid reactors and fixed and fluidized bed catalytic reactors.

**CH E 877.3
Mathematical Methods in Chemical
Engineering
1/2(3L)**

Prerequisite(s): CH E 322; or equivalent.

Linear Algebra and numerical methods for the solution of systems of equations. Advanced numerical methods for the solution of non-linear ordinary and partial differential equations encountered in fluid mechanics, heat and mass transfer and chemical engineering kinetics, curve fitting and optimization.

**CH E 878.3
Chemical Engineering
Thermodynamics
1/2(3L)**

Prerequisite(s): CH E 323; or equivalent.

Deals with the principles of thermodynamics, equations of state, phase and chemical reaction equilibria, solution theory, and applications to industrial problems.

**CH E 881.3
Process Engineering
1/2(3L)**

Examines the methods of process engineering used to achieve the best overall processing systems and includes; synthesis of processing alternatives; structure of process system; process economics; optimization applications and methods; engineering in the presence of uncertainty; simulation approach to difficult processing situations; problem assignments; involving class discussion, with special emphasis on a knowledge of chemical processes. Process safety and hazard analysis will also be discussed. A term paper will be required.

**CH E 882.3
Design of Industrial Waste Treatment
Systems
1/2(3L)**

Designed to provide the student with the fundamentals of air and water pollution problems and the control technology and legislation associated with these problems.

**CH E 884.3
Corrosion Engineering
1/2(3L)**

Intended for engineers and others who wish to develop an appreciation of the principles of corrosion and corrosion control and their application to the selection of materials of construction and the protection of engineering systems.

**CH E 885.3
Corrosion Control in Engineering
Systems
1/2(3L)**

Advanced course in engineering design for the prevention and control of corrosion in a wide range of engineering systems including: chemical and petrochemical plants; conventional and nuclear power plants; transportation systems; communications; structures. Several case studies of previous corrosion problems will be included.

**CH E 898.3
Special Topics
1/2(3T)**

Supervised investigation into selected aspects of advanced chemical engineering topics. This may take the form of assigned readings and seminars.

**CH E 990
Seminar**

Papers and discussions on recent developments in chemical engineering. Graduate students are required to attend these meetings for the duration of their program. Every graduate student is expected to present a seminar related to their research or project at some time before they receives the graduate degree.

**CH E 994
Research**

Students writing a Master's thesis must register for this course.

**CH E 996
Research**

Students writing a Ph.D. thesis must register for this course.

CHEMISTRY

Department of Chemistry, College of Arts & Science

The introductory CHEM courses were changed in 2002. Students with credit for CHEM 111.3 may take CHEM 221.3, 231.3, 242.3 and 250.3. Students with credit for CHEM 251.3 may take CHEM 255.3.

**CHEM 112.3
General Chemistry I: Structure, Bonding & Properties of Materials
1/2(3L-3.5P)**

Prerequisite(s): Chemistry 30 and Mathematics B30 (or Algebra 30). Mathematics C30 (or Geometry-Trigonometry 30) is strongly recommended.

Structure, bonding and properties of materials. Topics include atoms and molecules, bonding, molecular structure, intermolecular forces, states of matter, and properties of materials such as polymers, natural and synthetic materials, biomaterials, proteins, nucleic acids, carbohydrates, conductors, semiconductors, and insulators. The laboratory illustrates material covered in the lectures.

Note: Students with credit for CHEM 111 may not take this course for credit.

**CHEM 115.3
General Chemistry II: Chemical Processes
1/2(3L-3.5P)**

Prerequisite(s): CHEM 112.

Chemical reactions, including the rates and energetics of reactions and specific types of reactions. Topics include stoichiometry, chemical reactions, chemical kinetics, equilibrium, specific reactions, and thermodynamics.

Note: Students with credit for CHEM 111 may not take this course for credit.

**CHEM 221.3
Analytical Chemistry I
1/2(3L-4P)**

Prerequisite(s): CHEM 115.

Discussion of the basic principles and tenets of analytical science and how these aspects are put into practice in analytical techniques.

**CHEM 231.3
Inorganic Chemistry I
1/2(3L-3P-1T)**

Prerequisite(s): CHEM 115.

Discussion of atomic and molecular properties in terms of modern theories of structure and bonding. The laboratory provides experience in the preparation and investigation of the properties of typical inorganic compounds.

**CHEM 242.3
Physical Chemistry I
1/2(3L-3P-1T)**

Prerequisite(s): CHEM 115 and MATH 110 or 123.

The study of the structure of matter and the changes it undergoes. Topics include properties of materials, thermodynamics, chemical equilibria and chemical kinetics.

The laboratory provides experience with the use of physical-chemical equipment and problem solving skills.

**CHEM 243.3
Physical Chemistry II
1/2(3L-2T)**

Prerequisite(s): CHEM 242 and MATH 116 or 124.

An introduction to quantum chemistry and statistics of chemical systems as a foundation for courses concerned with the theory and spectroscopy of atomic and molecular systems.

**CHEM 250.3
Introduction to Organic Chemistry
1/2(3L-3P-1T)**

Prerequisite(s): CHEM 112.

This course is an introduction to organic chemistry; students will learn to name organic compounds, predict some of the properties and reactivity of compounds based on molecular structure, and grasp the importance of these concepts and their application to all sciences and life in general. Almost all the reactions in living matter involve organic compounds, and it is impossible to understand the molecular processes of living systems without knowing organic chemistry. CHEM 250.3 is intended as a basis for other courses, and a beginning for understanding organic and bio-organic chemistry. The laboratory will introduce students to basic chemical laboratory skills frequently used in organic chemistry.

Note: Students with credit for CHEM 251 may not take this course for credit.

**CHEM 252.3
Organic Chemistry II
1/2(3L-3P-1T)**

Prerequisite(s): CHEM 251 (or 151).

Discussion of structure determination, stereochemistry and mechanistic similarities of organic reactions. Syntheses will be used to help students learn to work with the large factual information that is organic chemistry. Students will be encouraged to solve challenging problems. The laboratory provides experience in the synthesis and investigation of the properties of organic compounds.

**CHEM 255.3 (First offered 2003-2004)
Bio-Organic Chemistry
1/2(3L-3P-1T)**

Prerequisite(s): CHEM 250; CHEM 115 and BIOCH 200 recommended.

This course is intended to give insight into the specific and fundamental role of organic reactions occurring in nature, to students of all scientific disciplines who have been introduced to organic chemistry and to the life sciences. The emphasis will be on the patterns of reactivity among natural products, rather than on the biochemical roles that these molecules play. The laboratory will introduce students to experimental approaches to biomimetic, biological and pharmaceutical chemistry.

**CHEM 302.3
Research Seminar
1&2(1L-1P-1S)**

Prerequisite(s): 15 credit units in chemistry. Deals with the non-technical aspects of the science of chemistry. The primary focus is

scientific communication, including oral, poster, and written presentations. Other topics include: information retrieval and on-line search techniques; resumes; science and ethics; and the history and philosophy of science. An oral and a poster presentation to the department are required.

**CHEM 322.3
Analytical Chemistry II
1/2(3L-4P)**

Prerequisite(s): CHEM 221.

Introduction to modern instrumental methods of chemical analyses. This course is presented in a problem-oriented learning approach. Students are expected to work in teams on class assigned problems. The laboratory is designed to develop basic understanding of common instrumental methods. Topics include chromatography, electrophoresis, electrochemistry and spectroscopy.

**CHEM 332.3
Inorganic Chemistry II
1/2(3L-4P)**

Prerequisite(s): CHEM 231 and 242.

An introduction to transition metal chemistry including coordination geometry and stereochemistry, ligand field theory, and spectroscopic, magnetic and thermodynamic properties of inorganic compounds. The laboratory work includes experiments on the preparation and characterization of transition metal compounds.

**CHEM 342.3
Physical Chemistry III
1/2(3L-4P)**

Prerequisite(s): CHEM 243 and MATH 225.

Theory and practice of atomic and molecular spectroscopy including both optical and magnetic resonance methods. The application of group theory to problems of spectroscopic analyses will be introduced.

Note: Students with credit for CHEM 349 may not take this course for credit.

**CHEM 346.3
Theoretical Chemistry
1/2(3L)**

Prerequisite(s): CHEM 243; MATH 225 and 264 or 266.

The methods of quantum mechanics are introduced and applied to basic problems in atomic and molecular structure. These include the rigid rotator, harmonic oscillator and hydrogen atom, as well as approximate treatments of many-electron atoms and molecules.

**CHEM 347.3
Chemical Thermodynamics
1/2(3L-3.5P)**

Prerequisite(s): CHEM 242 and MATH 116 or 124.

The presentation of the fundamental principles of thermodynamics with particular emphasis on generalized methods. Considerable time is devoted to the thermodynamics of solutions with emphasis on generalized methods for dealing with deviations from ideal behaviour. These principles are applied to the calculation of equilibrium compositions in liquid-vapour systems. The laboratory work consists of a

number of experiments relating to practical studies of the above concepts.

**CHEM 353.3
Organic Structure Analysis
1/2(3L-4P)**

Prerequisite(s): CHEM 252.

Deals with the theory and practice of techniques (primarily spectroscopic) used for the identification of organic compounds. Laboratories provide experience in the manipulation, transformation, separation and identification of organic compounds. *Note:* Students with credit for CHEM 458 may not take this course for credit.

**CHEM 354.3
Physical Organic Chemistry
1/2(3L-4P)**

Prerequisite(s): CHEM 252.

Provides a greater understanding of the structure of organic compounds, and the underlying principles and rationale for organic reactions. The laboratory portion involves experiments in molecular modelling (structures, structure-activity relationships, reaction paths), which will be performed on personal computers using modern software.

**CHEM 374.3
Energy Issues and the Environment
1/2(3L-2.5P)**

Prerequisite(s): CHEM 242.

Discusses facts and issues related to energy production and use in order to evaluate the technological choices that must be made to ensure a reasonable quality of life. The content of this course will be extended in problem sessions.

**CHEM 375.3
Pollution, Waste Disposal and the Environment
1/2(3L-3P)**

Prerequisite(s): CHEM 115.

The disposal and treatment of waste materials will be discussed in terms of their effect on the gaseous and aqueous environments. A series of problems designed to illustrate the material covered in each topic will be assigned. The laboratory sessions are designed to give some understanding of how tests for environmental quality are carried out in the field and in the laboratory.

**CHEM 377.3
Industrial Chemistry
1/2(3L)**

Prerequisite(s): CHEM 242.

Discussion of the basic principles of chemistry utilized in diverse technological practices.

**CHEM 402.0
Seminar
1&2(1S)**

Attendance at departmental seminar sessions throughout the academic year is required by students in the final year of a Four-year or Honours program. Consists of presentations by departmental visitors, faculty and students, followed by discussions.

The following 400-level courses may not all be offered in any one year. Each year an appropriate course selection will be offered to allow completion of a student's program. Students should consult a faculty advisor in the Department of Chemistry prior to making their selections.

CHEM 420.3
Selected Topics in Analytical Chemistry
1/2(3L-4P)

Prerequisite(s): CHEM 322.
Advanced laboratory course in analytical techniques. Much of the laboratory work will use specialized equipment available in the Department of Chemistry. Lectures cover the underlying theory of the topics and the principles of the instrumentation being used.

CHEM 429.3
Applied Techniques in Analytical Chemistry
1/2(3L-6P)

Prerequisite(s): CHEM 322.
Practical aspects of modern instrumental analysis, such as statistical treatment of data, special considerations for trace analysis, sampling techniques, and automation are covered. The laboratory is designed to give students an opportunity to apply these topics to a project focused on an instrumental technique (including computer interfacing) of their choice.

CHEM 430.3
Selected Topics in Inorganic Chemistry
1/2(3L)

Prerequisite(s) or Corequisite(s): CHEM 439.
Selected topics that are not dealt with or are covered only at an elementary level in other inorganic chemistry courses offered by the department. Possible topics include crystallographic and spectroscopic methods of structure determination, organometallic chemistry, cluster compounds, catalysis, nonaqueous solution chemistry, bioinorganic chemistry, structure and bonding, and excited state processes.

CHEM 433.3
Bioinorganic Chemistry
1/2 (3L-4P)

Prerequisite(s): CHEM 332.
This course presents a concise overview of the role of metal ions in biological systems. The laboratory is designed to help the student understand major concepts and learn a range of modern experimental techniques.

CHEM 439.3
Inorganic Chemistry III
1/2(3L-3.5P)

Prerequisite(s): CHEM 332.
Topics include reaction mechanisms of thermal substitutions, oxidation-reduction and photochemical reactions, organometallic chemistry, homogeneous catalysis and other topics of current interest such as bio-inorganic chemistry.

CHEM 440.3
Selected Topics in Physical Chemistry
1/2(3L)

Prerequisite(s): CHEM 342 and 346 (or 349).
Selected topics that are not dealt with or are covered only at an elementary level in other physical chemistry courses. Possible topics include advanced spectroscopy, nuclear chemistry, photochemistry, polymers, radiation chemistry, solid-state chemistry, structural techniques, surface and colloid chemistry.

CHEM 447.3
Statistical Mechanics and Chemical Kinetics
1/2(3L-3.5P)

Prerequisite(s): CHEM 342 and 346 (or 349).
Methods of statistical mechanics are introduced and applied to problems in chemistry. Advanced chemical kinetics are discussed with emphasis on fast-reaction techniques, theories of reaction and diffusion rates, and electrochemical aspects.

CHEM 450.3
Selected Topics in Organic Chemistry
1/2(3L)

Prerequisite(s): CHEM 354.
Selected topics that are not dealt with or are covered only at an elementary level in other organic chemistry courses. Possible topics include organic synthesis, organic reaction mechanisms, natural products, organometallic chemistry, heterocyclic chemistry, carbohydrate chemistry and organic photochemistry.

CHEM 455.3
Organic Synthesis
1/2(3L-4P)

Prerequisite(s): CHEM 354.
Principles of chemical reactions are applied to the problems of putting together particular types of bonds, groupings and compounds. The laboratory will investigate a variety of new synthetic methods and improved reaction procedures.

CHEM 456.3
Natural Products
1/2(3L)

Prerequisite(s): CHEM 252.
Provides a basic knowledge of Natural Products Chemistry with emphasis on secondary metabolism. Includes an overview of primary and secondary metabolism, modern techniques for studying secondary metabolism, biological reactions, interaction of plants with other living organisms, and major classes of bioactive compounds grouped according to their basic building blocks and their biogenesis.

CHEM 460.3
Selected Topics in Theoretical Chemistry
1/2(3L)

Prerequisite(s): CHEM 342 (or 349).
Selected topics that are not dealt with or are covered only at an elementary level in other theoretical chemistry courses. Possible topics include application of quantum mechanics to molecular structure and behaviour, advanced group theory, statistical mechanics and irreversible thermodynamics.

CHEM 482.3
Chemistry Research
1&2(6P)

Prerequisite(s): Permission of the department.
A laboratory, library, theoretical or computer study under the supervision of a member of the Department. At the end of the project the student will present both an oral and a written report summarizing the results.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

CHEM 398.3 1/2 (3S)

CHEM 498.3 1/2 (3S)

GRADUATE COURSES

Department of Chemistry, College of Graduate Studies & Research

CHEM 729.3 (Formerly 829)
Applied Techniques in Analytical Chemistry
1/2(3L-6P)

Prerequisite(s): CHEM 322; or equivalent.
Practical aspects of modern instrumental analysis, such as statistical treatment of data, special considerations for trace analysis, sampling techniques, and automation are covered. The laboratory is designed to give the student an opportunity to apply these topics to a project focused on an instrumental technique (including computer interfacing) of their choice.

Note: Students with credit for CHEM 429 or 829 may not take this class for credit.

CHEM 801.6 – Modern Aspects of Chemistry
1/2(3L)

An overview of the core material required for graduate research in chemistry presented in modular form. Emphasis is placed on integrating chemical knowledge from all subdisciplines of chemistry encompassing both experimental and theoretical approaches.

CHEM 820.3
Physical Methods of Molecular Structure Determination
1/2(3L)

This course presents the application of various spectroscopic methods to structure determination including mass spectrometry (MS), infrared spectroscopy (IR), ultraviolet spectroscopy (UV), and ^1H and ^{13}C nuclear magnetic resonance spectroscopy (NMR). The majority of the course (approx. 75%) will focus on NMR based methods including multipulse and two dimensional techniques. Although aspects of the underlying theory are presented, the course focuses the integrated interpretation (as opposed to the theory) of various spectroscopic data for the purpose of structure determination; problem solving is emphasized.

CHEM 823.3
Selected Topics in Analytical Chemistry
1/2(3L)

CHEM 824.3
Analytical Separation Techniques
1/2(3L)
Basis theory and principles of separation will be discussed for modern chromatographic techniques used in qualitative and quantitative analytical chemistry. The focus will be mainly on modern liquid chromatography and capillary electrophoresis.

CHEM 825.3
Analytical Electrochemistry
1/2(3L)

Advanced theory of phenomena occurring at the electrode-solution interface will be discussed in relation to their application in modern electrochemical techniques of analysis. Various practical aspects of electroanalysis will be considered including its use in qualitative and quantitative analysis and in studies of kinetics and thermodynamics.

CHEM 832.3
Selected Topics in Inorganic Chemistry
1/2(3L)

CHEM 834.3
Selected Topics in Physical Chemistry
1/2(3L)

CHEM 835.3
Selected Topics in Theoretical Chemistry
1/2(3L)

CHEM 836.3
Special Topics in Theories of Solutions
1/2(3L)

A brief but critical study of the theories and concepts of the liquid state followed by a discussion of selected topics illustrating the importance of solvent effects in the study of solutions.

CHEM 837.3
EPR Spectroscopy
1/2(3L)

The basic theory of EPR spectroscopy, general features and analysis of spectra, experimental methods and applications to chemical problems.

CHEM 838.3
Chemistry of the Excited State
1/2(3L)

The structure and reactions of atoms and molecules in electronically excited states will be discussed. Particular attention will be paid to the processes by which excited states may be produced and deactivated. Examples from recent literature will be considered.

CHEM 840.3
Photochemistry
1/2(3L)

An introduction to the theory and techniques of photochemistry and its applications.

**CHEM 841.3
NMR Spectroscopy
1/2(3L)**

The basic theory of NMR spectroscopy, general features and analysis of spectra, experimental methods and applications to chemical problems.

**CHEM 842.3
Chemical Thermodynamics
1/2(3L)**

Selected topics in chemical thermodynamics.

**CHEM 845.3
Chemical Kinetics
1/2(3L)**

Kinetic theories, techniques and methods of their application to reactions in the gas and liquid phase.

**CHEM 848.3
Theoretical Chemistry
1/2(3L)**

Prerequisite(s): CHEM 346; or equivalent.

The application of the principles of quantum mechanics to the study of molecular structure.

**CHEM 849.3
Radiation Chemistry
1/2(3L)**

The action of ionizing radiations on chemical systems is described.

**CHEM 850.3
Principles of Organic Synthesis
1/2(3L)**

The advantages and limitation of new and general methods of synthesis.

**CHEM 851.3
Stereochemistry and Asymmetric Synthesis
1/2(3L)**

The fundamental principles of stereochemistry and stereoisomerism in organic compounds will be described. Various strategies and methods for the synthesis of enantiomerically pure compounds will be discussed.

**CHEM 852.3
Selected Topics in Organic Chemistry
1/2(3L)**

**CHEM 855.3
Organic Reactions
1/2(3L)**

A survey of organic reactions and reagents including reaction mechanisms and synthetic applications.

**CHEM 858.3
Natural Products Chemistry
1/2(3L)**

Provides a basic knowledge of natural products chemistry with emphasis on secondary metabolism. Topics covered include an overview of primary and secondary metabolism, modern techniques for studying secondary metabolism, biological reactions, chemical interactions between living organisms, and classes of bioactive compounds grouped according to building blocks and biogenesis.

**CHEM 859.3
The Organic Chemistry of Transition Elements
1/2(3L)**

Topics include the chemistry of d and f ligands of transition metals, the 18 electron

rule, the iron group metallocenes, transition metal acetylene and carbon complexes, alkene, allyl and ethyl complexes, the use of transition metal complexes in organic synthesis.

**CHEM 860.3
Proteins and Nucleic Acids
1/2(3L)**

The structure and conformation of proteins and nucleic acids and the properties of these biopolymers in aqueous solution, methods of separation and molecular weight determination including chromatography, electrophoresis, sedimentation and diffusion are discussed. The biosynthesis of these polymers is examined in detail.

**CHEM 990
Seminar**

Papers and discussion on recent developments in Chemistry. Graduate students are required to attend these meetings for the duration of their program, and during this period, are expected to present a seminar.

**CHEM 994
Research**

Students writing a Master's thesis must register for this course.

**CHEM 996
Research**

Students writing a Ph.D. thesis must register for this course.

CHINESE

Department of Religious Studies, College of Arts & Science

Students planning to take courses in Chinese must contact the instructor and obtain written permission before registering.

**CHIN 111.6
Introductory Chinese
1&2(3L)**

Provides conversational and reading knowledge of Chinese, with emphasis on the colloquial style. Restricted to students with no previous knowledge of Chinese.

**CHIN 130.6
Introduction to Classical Chinese Language and Literature
1/2(3L)**

Prerequisite(s): Permission of the department.

An introduction to the classical Chinese language and literature. Topics include principles of the writing system; major features of grammar and syntax; philosophical and literary vocabulary; and translation practice using original texts from Tao Ta Ching, the Analects, and other Chinese classics.

**CHIN 220.6
Intermediate Chinese I and II
1&2(3L)**

Prerequisite(s): CHIN 111 or permission of the department.

Further studies of selected Chinese historical, philosophical and literary materials, with emphasis on the literary (wen-yen) style.

CIVIL AND GEOLOGICAL ENGINEERING

Department of Civil and Geological Engineering, College of Engineering

**C E 212.3
Civil Engineering Materials
1(3L-1.5P)**

Prerequisite(s): CHEM 111 (beginning 2003 CHEM 114).

An introduction to the physical and mechanical properties of materials and the phenomenological bases for these behaviours. Fundamental concepts of materials science and engineering are introduced and applied to materials commonly encountered in civil engineering applications, including Portland cement concrete, metals and alloys, ceramics, polymers and polymer composites, and other materials such as wood, asphalt concrete, and soils.

**C E 225.3
Fluid Mechanics
2 (3L-1.5P)**

Prerequisite(s): G E 125 and MATH 223 (taken).

Provides an introduction to the subject area of fluid mechanics, including the properties of fluids, concepts of a continuum, fluid statics, kinematics, the general control volume conservation equation, continuity equation, momentum equation, Bernoulli's equation and measurement of fluid properties, pressure, velocity and discharge.

**C E 271.2
Surveying (Spring Camp)
3(P, 2 weeks)**

Basic introduction to the use and adjustments of survey equipment, and the associated field work and data interpretation required for engineering projects.

**C E 295.3
Design Project
2(1.5L-1.5P)**

Prerequisite(s): G E 120, and 42 credit units towards the B.E. degree.

Corequisite(s): C E 225, G E 213, and G E 300.

A design course in which the principles of design are learned by application to a suitable civil engineering project. The course requires that the students work in groups to achieve the desired outcome. Group interaction and performance is monitored throughout. Guest lectures from various industrial and other representatives will be provided to enhance the student's design experience.

**C E 311.3
Continuum Mechanics
1(3L-1.5P)**

Prerequisite(s): C E 212 and G E 213.

The application of equilibrium analysis to materials and systems that can be treated as continua. The laws of equilibrium, compatibility, and constitutive relationships are used to reduce physical problems to mathematical expressions. Concepts are introduced in the context of elastic theory and extended to other areas of relevance to civil engineering such as fluid flow, plasticity, viscoelasticity, and multi-phase material behaviour.

**C E 315.3
Fluid Mechanics and Hydraulics
1(3L-1.5P)**

Prerequisite(s): C E 225.

Builds on the concepts studied in C E 225 Fluid Mechanics. Introduces the concepts of potential flow dimensional analysis, boundary layer development, incompressible flow in pressure conduits, flow past objects, steady flow in open channels and hydraulic transients.

**C E 316.3
Geomatics
1(3L-1.5P)**

Prerequisite(s): C E 271; AutoCAD Level 1 (Equivalent experience and/or training in either or both).

An introduction to Geomatics. This course describes the land subdivision system in Canada and briefly discusses land subdivision and encumbrances. Coordinate systems are presented, including a discussion of astronomic and geometric reference ellipsoids to approximate the shape of the earth. Map projections used to show the position of points on the surface of the earth on a two-dimensional surface are also discussed. Universal Transverse Mercator (UTM) projections are presented in detail, and the theory and application of this coordinate system are studied as the basis for most Canadian control surveys. The use and application of digital surveying equipment is presented along with the elements of total station and data collector operation. The combined use of UTM coordinate and digital surveying information, along with Softdesk Civil computer software for earthwork design, is also discussed. Global positioning satellite (GPS) surveys are also discussed, along with the integration of satellite data with base maps and total station surveys. Geographic information systems are also described and presented with applications in this course.

**C E 317.3
Structural Analysis
1(3L-1.5P)**

Prerequisite(s): G E 213.

Introductory concepts for the analysis of structures are presented. Axial forces, shear forces and bending moments in statically determinant structures due to applied loads are determined, and methods for estimating deflections are covered. Computer analysis using the stiffness method is introduced and applied to 2D trusses. Manual analysis methods for statically indeterminate structures are considered briefly. An emphasis is placed on the application of basic analytical techniques, followed by the use of computer-based verifications.

**C E 318.3
Applied Engineering Mathematics
1(3L-1.5P)**

Prerequisite(s): MATH 224, CMPT 116, C E 225 (taken) and G E 213 (taken).

An introduction to the use of mathematical methods in applied civil engineering problems. Topics will include: matrix solution methods for systems of coupled equations, eigenvalue problems, and coordinate transformations; optimization and linear programming; and the solution of differential equations describing non-

stationary physical systems using analytical, finite difference and finite element methods. Numerical techniques using computer programs are emphasized.

**C E 319.3
Hydrology and Hydrogeology
2(3L-1.5P)**

Prerequisite(s): MATH 224, GEO E 218 and C E 225 (taken).

This course introduces the student to the hydrologic cycle, emphasizing the three components of the cycle; firstly the climatological elements of precipitation and evaporation, secondly, the unsaturated zone including infiltration, evapotranspiration and downward percolating soil moisture, and finally subsurface flow systems and hydrogeologic processes.

**C E 321.3
Structural Systems and Materials
2(3L-1.5P)**

Prerequisite(s): C E 212, 311 and 317.

The behaviour and applications of basic forms of structural systems are reviewed, including beam and column systems, arches and cable systems, trusses, braced systems and rigid frames. Limit States design principles in accordance with the National Building Code of Canada (NBC) are introduced as a means of dealing with uncertainty in design. The estimation of building loads is covered, including dead and live loads, snow and rain loads, and loads due to wind. An introduction is also given to the characteristics of common structural materials, including steel, reinforced concrete and wood.

**C E 327.3
Sanitary/Environmental Engineering I
2(3L-1.5P)**

Prerequisite(s): CHEM 111 (beginning 2003 CHEM 114) and C E 315 (taken).

Fundamental topics in the discipline of sanitary/environmental engineering are introduced. Topics include the design of municipal water distribution and wastewater collection systems; an introduction to water chemistry and water quality assessment; and design of physical and chemical treatment processes as they apply to water and waste water treatment. A brief overview of municipal solid waste management systems and storm water collection systems is also presented.

**C E 328.3
Introduction to Geotechnical
Engineering
1(3L-1.5P)**

Prerequisite(s): GEO E 218, C E 225 (taken) and G E. 213 (taken).

Classification systems and a review of phase relationships are provided. The fundamental concepts of effective stress as applied to volume change, shear strength and consolidation are emphasized. Both steady state and transient seepage analyses are used to develop concepts of pore water pressures that are incorporated into volume change and shear strength analyses. Concepts of stress state as applied to saturated and unsaturated soils form an integral part of understanding soil behavior. An introduction to foundation engineering that provides a survey of lateral earth pressure, bearing capacity of shallow and deep foundations, settlement and slope

stability are provided. This course does not provide students with a facility for design in foundation engineering. However, it will furnish a basic grounding in the fundamentals of soil mechanics for application to more advanced courses.

**C E 329.3
Transportation Engineering
2(3L-1.5P)**

Prerequisite(s): C E 316.

This course introduces the civil engineering student to planning, design, operation and management of air and road transportation systems.

**C E 414.3
Sanitary/Environmental Engineering II
1(3L-1.5P)**

Prerequisite(s): C E 327.

Additional topics in the discipline of sanitary/environmental engineering are introduced. Topics covered include the design of primary wastewater treatment systems; introduction to biological processes and waste degradation; design of biological wastewater treatment processes; and tertiary wastewater treatment. An introduction to sludge processing and air pollution is also presented.

**C E 415.3
Structures for Water Management
1(3L-1.5P)**

Prerequisite(s): C E 315 (taken).

A design course in which the basics of fluid mechanics (hydrostatics, continuity, energy and momentum) are applied to hydraulic design. The concrete gravity dam and spillway structures are used to introduce the basic aspects of hydraulic structure design with respect to forces and hydraulic analysis, including the important topic of energy dissipation. Other structures, such as those used for flood control, irrigation, hydropower, navigation, water supply, land and highway drainage, wildfowl habitat preservation, and water-based recreation, are also considered.

**C E 416.3
Geotechnical Engineering Practice
1(3L-1.5P)**

Prerequisite(s): C E 328 (or 326).

Covers the basics of foundation engineering. Methods of design and construction of earth retaining structures are presented. The stability analysis of open excavations is included. The design and construction of shallow foundations based on bearing capacity and settlement analysis are considered along with the design and installation of pile foundations. Methods of design of driven displacement piles, augered in place piles and cast in place piles are described. A theme of job site safety runs throughout the course.

**C E 417.3
Pavement Materials and Design
1(3L-1.5P)**

Prerequisite(s): C E 311 (or 313) and 328 (or 326).

Presents methods used to design, build, and predict the performance of road structures. The course draws heavily upon a material science and mechanics framework to quantify the effects of alternative materials, traffic loading and environmental

loading on road performance. Road structural design, materials specification, construction, rehabilitation, and maintenance of flexible and rigid pavements are presented in the overall context of effective road asset management.

**C E 418.3
Design in Reinforced Concrete
1(3L-3P)**

Prerequisite(s): C E 321 (or 322) (taken).

An introduction to the analysis and design of reinforced concrete structural members. Limit States and ultimate strength methods for beams and one-way slabs (singly and doubly reinforced) in flexure and shear. Introduction to the development of reinforcement. Design of short beam-columns. Deflection, cracking and vibration control. Design of footings.

**C E 420.3
Project Engineering
1(3L-1.5P)**

Prerequisite(s): G E 348, and 90 credit units towards the B.E. degree.

An introduction to the engineering and construction industries: the engineer's role in industry, construction and the economy. Deals with various aspects of engineering including, work plans and related studies. It also deals with the marketing of engineering services. It discusses control on construction projects and methods of ensuring quality. Construction tendering is covered in detail, including the preparation of instructions to bidders, General and supplementary conditions, specifications, receiving tenders and awarding contracts. Bidding and estimating is also discussed. Computerized precedence network scheduling using various software packages is demonstrated. This course includes discussions on construction claims, professional liability, arbitration and the use of courts to settle disputes.

**C E 463.3
Advanced Structural Analysis
2(3L-1.5P)**

Prerequisite(s): C E 317.

Deals with advanced techniques for the analysis of determinate and indeterminate structures, including energy-based methods, moment distribution method with joint translation, influence lines, non-prismatic members. Computer analysis based on the stiffness formulation is presented for space frames. Finite element analysis is introduced for plate-like elements loaded in their own plane. Emphasis is placed on basic analytical techniques, followed by computer verification.

**C E 464.3
Water Resources Engineering
2(3L-1.5P)**

Prerequisite(s): G E 348 and C E 315 (taken).

Includes the consideration of water resource systems and their management, establishment of the various data needs for water resource systems analysis, the use of economics as a decision-making tool in water resources engineering and conceptual design of a number of components of a water resource system. While focussed on the engineering aspects of water resource management, the student is also exposed to some of the broader issues which impact management decisions for the resource

(e.g., social, environmental, legal). An introduction is also provided to the basic principles of planning and to the use of reservoirs in water resource systems.

**C E 466.3
Modeling of Earth Structures
2(3L-1.5P)**

Prerequisite(s): C E 328 (or 326).

Design of earth embankments, especially those used for reservoir retention, encompasses virtually every aspect of soil mechanics and geotechnical engineering. Design and construction techniques for embankment foundations which will not permit excessive seepage, settlement or failure are investigated. Protection of slopes from erosion and embankment stability are discussed, as is the control of seepage through and below the embankment. Instrumentation of earth dams to ensure their safety and check on their performance is also presented.

**C E 467.3
Transportation and Regional
Development
2(3L-1.5P)**

Prerequisite(s): C E 329 (or 227) and G E 348; or permission of the Department Head.

Introduction to transportation technology and its impact upon urban and regional development. Topics include transit technology, highway technology, transportation in Northern Canada, urban transportation planning, transportation economics and regulation, and current issues in transportation.

**C E 468.3
Design of Waste Management
Systems
2(3L-1.5P)**

Prerequisite(s): C E 319, 327 and 328 OR permission of the Department Head.

The course contains four principal components; characterization of solid waste streams (municipal mine tailings, waste rock, agricultural and industrial); an introduction to contaminant transport process in ground water; a review of the design elements of containment systems; and finally discussion of case studies of containment system.

**C E 470.3
Design in Structural Steel
2(3L-3P)**

Prerequisite(s): C E 321.

An introduction to the design of structural steel members and connections. Limit States design principles, in conformance with the Canadian steel design Standard CSA-S16.1, are used as the basis for design. Types of members and components include tension and flexural members, columns and beam columns, and bolted and welded connections. Emphasis is placed on basic design procedures, followed by the use of computer-based verification.

**C E 471.3
Finite Elements Fundamentals and
Engineering Applications
SS (3L-1.5P)**

Prerequisite(s): C E 311, 317 and 318. Must be registered in the Study Abroad Program.

This course introduces students to the theory and basic concepts of finite elements

as applied to bars, beams, and plane frame structures, as well as two-dimensional elastic solids. Students also learn how to construct computer codes capable of performing finite element analysis of frame structures and two-dimensional elastic solids.

**C E 495.6
Capstone Design Project
1&2(1.5L-1.5P)**

Prerequisite(s): C E 295, G E 300 and 95 credit units towards the B.E. degree. Corequisite(s): G E 348 and C E 420. G E 348 must be taken in term one to be considered as a corequisite.

A final design course in which advanced principles of design are learned by application to a suitable civil engineering project. The course, which builds upon the foundation established in C E 295, focuses on approaches to be taken in defining complex problems (including the outlining of project objectives and scope), acquisition of suitable data resources, generation of alternative solutions, methods for selecting design alternatives and project implementation. Design philosophy and methods are discussed and explored in the context of the particular assignment given for the current year. The course requires that the students work in groups to achieve the desired outcome. Group interaction and performance is monitored throughout. Guest lectures from various industrial and other representatives will be provided to enhance the student's design experience.

GRADUATE COURSES

Department of Civil and Geological Engineering, College of Graduate Studies & Research

**C E 801.3
Indeterminate Structural Analysis
1/2(3L)**

Reviews approximate methods for analyzing the effect of lateral forces on tall buildings. The analysis of arches. The slope deflection method. Matrix techniques as used in the force and displacement methods of analysis for application with digital computers.

**C E 802.3
Theory of Elasticity I
1(3L)**

Introduction; plane stress and plane strain; two dimensional problems in rectangular and polar co-ordinates; analysis of stress and strain in three dimensions, elementary problems of elasticity in three dimensions.

**C E 804.3
Advanced Dynamics of Structures
2(3L)**

Prerequisite(s): MATH 338 or equivalent. Behaviour of materials and structures under dynamic loading; simplified analysis and design principles of structures subjected to wind, earthquake and other dynamic loading.

**C E 807.3
Numerical Methods in Structural Engineering
1/2(3L)**

The nature of complex problems in structural engineering and the numerical methods available for obtaining practical

solutions, with emphasis on finite difference, series and energy methods for boundary value problems, and numerical integration procedures for initial value problems.

**C E 808.3
Elastic Stability
2(3L)**

Structural stability problems; stability of equilibrium; exact and approximate solutions of elastic stability of columns including Newmark's Methods of numerical integration; study of beam-columns; local and lateral buckling of beams.

**C E 809.3
Plastic Analysis and Design
1(3L)**

The elastic and plastic properties of structural metals; fundamental principles of ultimate load analysis of structural members and rigid frames; designed procedure for rigid frame structures.

**C E 810.3
Structural Steel Design
1(3L)**

An advanced study of the design of structural steel members with emphasis on recent changes in design specifications, covering tension members, compression members, local and torsional buckling, beams, and beam-columns.

**C E 815.3
Advanced Reinforced Concrete
1/2(3L)**

Behaviour of reinforced concrete beams under bending moment and shear. Analysis and design of reinforced concrete two-way slabs.

**C E 816.3
Prestressed Concrete
1(3L)**

Material, prestressing systems and loss of prestress. Analysis and design of determinate structures: working stresses, ultimate design, shear, bond, bearing and deflection. Indeterminate structures: continuous beams, floor slabs and frames.

**C E 818.3
Concrete Technology I
1/2(3L)**

Types of cements, compounds of cements, structure of cement paste, theory and practice of aggregate grading, fresh concrete, mix design of concrete.

**C E 819.3
Concrete Technology II
1/2(3L)**

Nature of strength of concrete, elasticity, shrinkage and creep, chemical and physical durability, testing of concrete, light weight and high density concretes.

**C E 821.3
Surface Water Quality
1/2(3L-1.5P)**

Water quality aspects of rivers and lakes and implications of waste water input are discussed. Topics include surface water quality parameters, point and non point source input characteristics, water quality measurements, mixing and self-purification processes, water quality modeling methods.

**C E 822.3
Sanitary Engineering I
1/2(3L-1.5P)**

Water chemistry fundamentals underlying water and waste water treatment methods and groundwater chemistry are discussed. Principles covered include kinetics, chemical equilibrium, acid-base systems, complexation, precipitation-dissolution and oxidation reduction.

**C E 823.3
Sanitary Engineering II
1/2(3L-3P)**

Application of physical, chemical and microbiological principles in water and waste water treatment operations processes, design and control.

**C E 824.3
Advanced Physical Chemical Treatment
1/2(3L)**

Detailed study of the theory and design of physical and chemical unit processes utilized in water and wastewater treatment. Equalization, sedimentation, flotation, adsorption, gas stripping, membrane process, neutralization, disinfection, water softening, chemical oxidation, ion exchange are discussed.

**C E 825.3
Biological Waste Water Treatment
1/2(3L)**

Detailed study of the theory and design of biological suspended-culture and attached-culture systems utilized in domestic wastewater treatment. Activated sludge processes, aerated lagoons, trickling filters, rotating biological contactors, submerged biofilm process, sequencing batch reactors, sludge digestion are discussed.

**C E 826.3
Solid and Hazardous Waste Management
1/2(3L)**

Problems in solid and hazardous waste management are covered with respect to long term closure and containment. Principles of soil cover design are reviewed. Other topics include nuclear waste disposal, disposal of mining tailings and the design of municipal landfills.

**C E 830.3
Advanced Open Channel Flow
1/2(3L)**

Hydraulics of open channel flow. Basic principles; specific energy; specific force; uniform flow; water surface profiles; hydraulic jump; slope-area and contracted area method; transitions for subcritical and supercritical flow; flood routing; spatially varied flow. Laboratory work includes practical design problems and some experiments in the fluid mechanics laboratory.

**C E 831.3
Wave Mechanics (Free Liquid Surfaces)
1/2(2L-3P)**

The theory of long and short waves on open water with practical applications to regional conditions and problems. Topics include: long wave theory; applications to natural channels and canals; oscillations in chambers; tides; numerical methods of solving long wave equations - finite

differences - method of characteristics - computer application; short wave theory; generation by wind, wave patterns at obstructions; shallow water effects; practical applications - wave resistant structures; sediment transport.

**C E 832.3
Sediment Transport and River Engineering
1/2(2L)**

Analysis, design and control of channels, canals, and rivers, with erodible boundaries. Topics include initiation of sediment movement, transport processes, sediment transport equations, scour and deposition. Regime Theory for canals and rivers, other river development equations, channel roughness, control of rivers and effects of these controls, movable bed models. Term papers on a topic chosen by the student may be required.

**C E 833.3
Water Resources Development
1/2(3L)**

Water availability and demand; basic data requirements; procedures for economic analysis, benefit-cost studies, and cost allocation; components and operating features of multi-purpose projects for flood control, navigation, water power, irrigation, water supply, and recreation.

**C E 835.3
Pumps and Hydraulic Transients
1/2(3L)**

Theory of turbomachinery; design and selection of pumps; affinity laws; pumping plant layout; water hammer in pipelines; penstocks, and pumping systems; pressure relief, surge and surge tanks. Laboratory work includes tests on pumps, water hammer and surge apparatus.

**C E 840.3
Surface Hydrology
1/2(3L)**

Hillslope hydrologic processes are studied with particular emphasis placed on runoff producing mechanisms under both snowmelt and rainfall conditions. The influence of soil moisture conditions is of prime concern. The relationship between soil moisture and soil is studied in detail. The influence of evapotranspiration on soil moisture movement and runoff is also discussed.

**C E 851.3
New Developments in Geotechnical Engineering
1/2(3L)**

An introduction to the use of vertical and horizontal barriers in controlling contaminant migration. The factors and processes controlling the initial and long-term performance of soil cover, liners and cutoff walls are examined and illustrated with case histories. The use of geomembranes, geotextiles, chemical grouting, cement based grouting and other recent developments in barrier technology are also explored.

**C E 852.3
Advanced Soil Mechanics Laboratory
1/2(1L-3P)**

Laboratory investigation of advanced aspects of soil behaviour and testing, including consolidation, shear strength,

compaction, index, grain size, permeability and specific gravity tests. Course requirements will include critical review and discussion of test methods, test results, and background literature.

**C E 854.3
Unsaturated Soil Technology
1(3L)**

Physico-chemical properties of clay soils, rheological properties of soils, behaviour of unsaturated soils, description of their stress state, measurement of soil suction, flow of water through unsaturated soils, shear strength of unsaturated soils, volume change behaviour of unsaturated soils, application of flow, shear strength and volume changes to practical engineering problems, theory of consolidation of moisture movement for unsaturated soils, pore pressure parameters and their estimation, measurement of soil properties such as the Soil-Water Characteristic curve.

**C E 855.3
Volume Change and Strength
Characteristics of Soils
1(3L)**

Deformation of saturated soils; theories of primary and secondary consolidation; settlement analysis; swelling properties of clays; shear strength theory for cohesionless and cohesive soils; pore pressure parameters. An introduction to critical state soil mechanics is also provided.

**C E 856.3
Advanced Earth Structures
2(3L)**

Aspects of earth embankment design; seepage in composite sections and anisotropic materials by graphical and numerical methods; methods of stability analysis and their application to natural and artificial slopes; field observations and instrumentation.

**C E 858.3
Foundation Design
2(3L)**

Advanced topics in soil mechanics: active and passive pressure; flexible bulkhead design; bearing capacity theories; dynamic and vibratory loads; design of piles and pile groups; load tests and their interpretation; theoretical, empirical and numerical solutions for foundation settlements including the selection of soil parameters.

**C E 859.3
Site Exploration
2(3L)**

Principles of field exploration and monitoring for bridges, dams, building foundations, highways, slope stability problems, groundwater studies, industrial and urban site development. The application of basic principles of stratigraphy, structural geology, soil mapping, drilling technology, geophysics, survey control and instrumentation. Planning, execution and interpretation of data.

**C E 861.3
Transportation Planning
1/2(3L)**

Transportation administration, planning goals, the design and the methodology of a land-use transportation study, continuation

of the study and implementation of proposals. Problems and issues in the co-ordination of transport systems and agencies.

**C E 862.3
Transportation Systems Engineering
1/2(3L)**

An introduction to the systems approach and probabilistic modeling discussion of the uses and limitations of systems in planning, and designing transportation facilities as well as analyzing the operation of existing transportation facilities.

**C E 864.3
Terrain Evaluation
1/2(3L-3P)**

Air photo interpretation is used to evaluate the physical environment for engineering and environmental planning purposes. The emphasis is on the engineering significance of landforms and their materials.

**C E 866.3
Pavement Management System I
1/2(3L)**

Stress analysis, theory and design of flexible and rigid pavements, aggregates, soil cement, asphalt aggregate mixtures, salt, lime and other methods of stabilization, study of road tests.

**C E 867.3
Pavement Management System II
1/2(2L-3P)**

Properties and tests of bituminous materials; rheology of asphalt; asphalt mix design; construction practices and control; performance of asphalt pavements.

**C E 889.3
Finite Element Method
2(3L)**

Review of stiffness matrix method, two dimensional finite element analysis, plate bending formulations and non-linear problems; field problems, seepage, settlement, etc.; analysis of shells, vibration and stability problems; introduction to finite element methods followed by a separate group studies of specific field problems related to structures, geotechnical and transportation problems, engineering mechanics, etc.

**C E 898.3/899.6
Special Topics
1/2(L/S/P), 1&2(L/S/P)**

May consist of assigned reading, lectures by staff members, discussion periods and laboratory exercises with reports. Depending on the interests of the student and his supervisor, the topics are selected from one of the research fields of Civil Engineering, including: Structural, Soil, or Fluid Mechanics; Sanitary Engineering; Transportation Engineering and related subjects.

**C E 990
Seminar**

A seminar is held periodically throughout the regular session. The current literature is reviewed and discussed. Graduate students are required to attend these meetings for the duration of their program.

**C E 992.6
Project**

Students undertaking the project Master's degree (M.Eng.) must register in this course. It consists of independent study and investigation of a real world problem, and submission of an acceptable report on the investigation.

**C E 994
Research**

Students writing a Master's thesis must register for this course.

**C E 996
Research**

Students writing a Ph.D. thesis must register for this course.

CLASSICS

Department of History, College of Arts & Science

For information on relevant programs see Classics in the College of Arts & Science section of the *Calendar*.

Knowledge of Latin or Greek is not a prerequisite for the following courses.

**CLASS 103.3
Medical Terminology (Formerly 163)
1/2(3L)**

Presents the most important Greek and Latin roots of the vocabulary of contemporary medicine and demonstrates the predictable patterns by which these roots combine. Students will learn to define new compounds and phrases by analysis of their parts and will be introduced to language history, linguistic principles and etymology.

Note: Students with credit for CLASS 163, 241, 262 or 263 may not take this course for credit. This course may be taken as an elective only under Requirement 7 of Program Types A, B, C, and D.

**CLASS 104.3
The Classical Myths (Formerly 238)
1/2(3L)**

A study of the traditional stories of Greek gods and heroes with some consideration given to both earlier Mesopotamian and later Roman mythic traditions.

Note: May be taken as an elective only under Requirement 7 of Program Types A, B, C and D.

**CLASS 105.3
The Classical Roots of English
(Formerly 215)
1/2(3L)**

An examination of the Latin and Greek roots of English vocabulary and grammar.

Note: This course may be taken as an elective only under Requirement 7 of Program Types A, B, C and D and under Requirements 5 of Program Types B and C.

**CLASS 110.3
Greek Civilization
1/2(3L)**

A survey of the culture of the Greeks to the end of the Classical period, based on

readings in translation from Greek literature and on other ancient source materials.

**CLASS 111.3
Roman Civilization
1/2(3L)**

Surveys Roman culture in the Republican and Imperial periods, based on readings in translation from Roman literature and on other ancient source materials.

**CLASS 220.3
Daily Life in Ancient Greece and Rome
1/2(3L)**

Prerequisite(s): 6 credit units from: ARCH 116; CLASS 110, 111; Hist 110, 114.; or the instructor's permission.

Studies daily life in ancient Athens and Rome.

**CLASS 225.3
Women in Antiquity
1/2(3L)**

Prerequisite(s): CLASS 110 and 111, or completion of 30 credit units at the university. Studies the life and achievements of women in the ancient world.

**CLASS 226.3 (Formerly 331)
Tragedy
1/2(3L)**

Prerequisite(s): CLASS 110, 111 or completion of 30 credit units at the university.

Careful reading and analysis of works by Aeschylus, Sophocles, Euripides and Seneca, with emphasis on intellectual and aesthetic questions, staging, and modern approaches to the literary interpretation of ancient plays.

Note: Students with credit for CLASS 331 may not take this course for credit.

**CLASS 227.3 (Formerly 332)
Comedy
1/2(3L)**

Prerequisite(s): CLASS 110, 111 or completion of 30 credit units at the university.

An introduction to ancient Greek and Roman comedy through careful study of the works of Aristophanes, Menander, Plautus and Terence.

Note: Students with credit for CLASS 332 may not take this course for credit.

**CLASS 228.3 (Formerly 334)
Epic
1/2(3L)**

Prerequisite(s): CLASS 110 and 111 or completion of 30 credit units at the university.

An introduction to Greek and Roman epic poetry with emphasis on its artistic qualities and cultural significance. Selections from Homer, Hesiod, Apollonius, Virgil, Ovid, Lucan, and/or Statius.

Note: Students with credit for CLASS 334 may not take this course for credit.

**CLASS 233.3
Introduction to Ancient Thought
1/2(3L)**

Prerequisite(s): CLASS 110 and 111, or completion of 30 credit units at the university. Studies the basic texts for Greek and Roman ideas about religion, science, society and morality.

**CLASS 234.3
Roman Law
1/2(3L)**

Prerequisite(s): CLASS 111 or HIST 201 or completion of 30 credit units at the university.
The development of Roman Law from the Twelve Tables to Justinian, with some indication of its influence in medieval and modern times.

**CLASS 240.3
Ancient Art and Architecture I: Bronze Age to Classical Greece
1/2(3L)**

Prerequisite(s): CLASS 110 and 111, or completion of 30 credit units at the university.
An introduction to the art and architecture of the Aegean Bronze Age and the origins and development of Greek vase painting, sculpture and architecture to the end of the Classical era.

Note: Students with credit for ART 201 may not take this course for credit.

**CLASS 242.3
Ancient Art and Architecture II: The Graeco-Roman World
1/2(3L)**

Prerequisite(s): CLASS 110 and 111, or completion of 30 credit units at the university.
A study of the Art and Architecture of the Graeco-Roman World (200 BCE to 400 CE), with focus on the Roman adaptation and transformation of Hellenistic Greek aesthetic practices and principles in the spheres of architecture, sculpture, interior decoration and luxury crafts.

Note: Students with credit for ART 201 may not take this course for credit.

**CLASS 247.3 (Formerly 236)
Introduction to Greek Archaeology
1/2(3L)**

Prerequisite(s): ARCH 112 or 116 or CLASS 110.

An introduction to the major sites of the Aegean from the Bronze Age to the Hellenistic Era, with emphasis on the reconstruction of culture through the archaeological record.

Note: Students with credit for CLASS 236 may not take this course for credit.

**CLASS 248.3 (Formerly 236)
Introduction to Roman Archaeology
1/2(3L)**

Prerequisite(s): ARCH 112 or 116 or CLASS 111.

An introduction to the major sites of the Roman world, from the Etruscan period to the early empire, focusing on evidence from sites in Italy and the Provinces from which the rise of Roman culture and its impact on other cultures will be assessed.

Note: Students with credit for CLASS 236 may not take this course for credit.

**CLASS 252.3
Paganism and Christianity in the Early Christian Centuries of the Roman Empire
1/2(3L)**

Prerequisite(s): CLASS 110 and 111, or completion of 30 credit units at the university.

A study of the relationships between paganism and Christianity until 430 C.E.

**CLASS 259.3
Ancient Christian Literature
1/2(3L)**

Prerequisite(s): CLASS 111 or completion of 30 credit units at the university.

A survey of the major literary works of the Greek and Latin Christian Fathers, with emphasis on the poetry of Gregory Nazianzen and on Augustine's Confessions.

**CLASS 333.3
Satire
1/2(3L)**

Prerequisite(s): CLASS 110 and 111.
Studies the origins and development of Roman Satire, with particular attention to such authors as Horace, Juvenal, Seneca, Persius and Petronius.

**CLASS 341.3
Greek Religion
1/2(3L)**

Prerequisite(s): CLASS 110 and 111.
Greek religion to the time of Alexander.

**CLASS 343.3
Roman Erotic Poetry
1/2(3L)**

Prerequisite(s): CLASS 110 and 111.
The love-poetry of Catullus, Propertius, Tibullus, Horace, Virgil and Ovid; English translations of each poem will be studied in conjunction with the Latin original.

**CLASS 356.3
The Archaeology of the Aegean Bronze Age
1/2(3L)**

Prerequisite(s): CLASS 247.
A study of the material remains of Bronze Age cultures in the Aegean – Minoan, Cycladic and Mycenaean – to reconstruct the contexts in which these prehistoric cultures evolved and were socially active.

**CLASS 357.3
The Archaeology of the Early Greek Polis
1/2(3L)**

Prerequisite(s): CLASS 247.
A study of the material remains of the 11th to the 6th centuries B.C.E. in Greece that witness the emergence of culture from a period of severe recession to the florescence of the polis or "city state" that becomes the hallmark of the Classical era.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

- CLASS 398.3 1/2(3S)
- CLASS 399.6 1&2(3S)
- CLASS 498.3 1/2(3S)
- CLASS 499.6 1&2(3S)

COMMUNITY AND CLINICAL DENTISTRY

Department of Community and Clinical Dentistry, College of Dentistry

FOUR YEAR D.M.D. PROGRAM

**C&CD 208.2 (Formerly C&P D 208)
Principles and Practice of Dentistry
1(2L), 2(1L)**

Introduces students to a number of topics related to the social context within which dentistry exists. These include the history of dentistry, dentistry and ethics, the development of dental education, oral health care delivery systems, current issues in oral health and oral health services in Saskatchewan.

**C&CD 218.2 (Formerly C&P D 218)
Preventive Dentistry
2(2L)**

Reviews the epidemiology of oral diseases and current concepts of prevention and their practical application. The various uses of fluorides in disease prevention are dealt with in depth. Other measures discussed include fissure sealants, nutritional counselling and patient motivation in relation both to dental practice and community health programs.

**C&CD 220.4 (Formerly R&P D 220)
Operative Dentistry
1(2L-4P), 2(1L-2P)**

This is a preclinical lecture/ demonstration/ laboratory course introducing the student to the basic biomechanical principles of tooth restoration. The course emphasizes the development of manual dexterity skills using rotary and hand instruments. Attention is also given to the development of professional skills in terms of organization, tidiness and time management. The need for infection control is also introduced.

**C&CD 221.2 (Formerly R&P D 221)
Dental Materials
1&2(1L)**

This course is a basic program to familiarize students with the terminology and theoretical concepts of dental materials used in clinical dentistry, as well as the safety issues concerning dental materials.

**C&CD 230.2 (Formerly R&P D 230)
Removable Prosthodontics
2(1L-2P)**

A preclinical lecture/ demonstration/ laboratory course in which students will undertake laboratory exercises relating to technical procedures involved in the fabrication of complete denture prostheses. This course will also introduce the students to a clinical setting in which they will assist senior students with the diagnosis and treatment planning as well as the technical procedures required in the provision of prosthetic service.

**C&CD 317.2 (Formerly C&P D 317)
Orthodontics
2(1L, 2.5P)**

The orthodontic lectures in this year emphasize the diagnostic and treatment planning aspect of simple and complex orthodontic cases, as well as their treatment and management. Second year provides the basics of case presentation and patient evaluation and prepares the student for the orthodontic clinic.

**C&CD 320.4 (Formerly R&P D 320)
Operative Dentistry
1(1L-2.5P), 2(1L-3C)**

Term 1 consists of review material and a six-week competency performance exam to prepare students for patient treatment in Term 2. Upon entering the dental clinic, students are introduced to clinic protocol and staff through a series of exercises using extracted human teeth in plaster pucks. Once familiarized with the clinic, students commence patient care supplemented by weekly lectures on treatment planning, restorative techniques and materials.

**C&CD 324.2 (Formerly C&P D 324)
Pedodontics
2(1L, 2P)**

This course strives to introduce students to various aspects of basic Pediatric Dentistry. The course objectives have been designed to aid the student in gaining a clinical knowledge of restorative dentistry for the primary dentition, pulp therapy for primary teeth, pediatric radiology, simple space maintenance, and diagnosis and treatment planning for the child patient.

**C&CD 330.4 (Formerly R&P D 330)
Removable Prosthodontics
1&2(1L-2.5P)**

A preclinical/clinical lecture/ demonstration/ laboratory course in which students will continue to undertake exercises relating to technical procedures involved in fabricating complete dentures and treatment planning of removable partial dentures. It will also prepare students for patient treatment in Term II. Once oriented, students will start treatment on patients in the provision of complete denture prostheses. Clinical experience will be supplemented by weekly lectures and seminars related to the art and science of removable prosthodontics.

**C&CD 340.4 (Formerly R&P D 340)
Fixed Prosthodontics
1&2(1L-2.5P)**

A preclinical course that introduces the basic fixed prosthodontics principles and techniques required to prepare teeth, to fabricate provisional restorations and to learn the clinical and laboratory techniques necessary to fabricate a definitive cast metal restoration.

**C&CD 350.2 (Formerly R&P D 350)
Endodontics
2(L)**

This course is designed to impart to the students the basic rationale, biological principles, treatment objectives and treatment procedures in endodontic therapy.

**C&CD 417.4
Orthodontics
1&2(1L-2.5C)**

Orthodontic lectures in this year will continue to emphasize the diagnostic and treatment planning aspects of simple and complex orthodontic cases, as well as provide an insight into their treatment techniques and patient management.

**C&CD 420.4
Operative Dentistry
1(1L-2.5C), 2(4C)**

This is a program of continued experience in the discipline of operative dentistry, providing treatment planning and efficient delivery of restorative dental procedures. Students will build upon previous experience tackling more complex cases and utilizing a broader array of dental materials. The lecture program will provide supplemental knowledge to encourage independent inquiry and self-evaluation.

**C&CD 424.4
Pedodontics
1&2(1L-2.5C)**

This course is a continuation of C&CD 324 and strives to introduce further aspects of basic pedodontics not covered in the introductory course. The course objectives have also been designed to aid the students in gaining a clinical knowledge of subjects such as traumatic injuries to primary and young permanent teeth, child growth and development, behaviour management.

**C&CD 430.4
Removable Prosthodontics
1&2(1L-5.5C)**

Lecture/discussion/seminar sessions in clinical application of complete and removable partial denture theory. Clinical practice in complete and partial denture therapy.

**C&CD 440.4
Fixed Prosthodontics
1&2(1L-3C)**

Lectures and clinical practical sessions to provide additional experience preparing teeth for full and partial coverage restorations early in Term 1, as well as to prepare for the transition to clinical treatment. Beginning in the second half of Term 1 and extending into Term 2, clinical procedures and techniques are explained through lectures and patient treatment.

**C&CD 450.4
Endodontics
1&2(1L-3C)**

This course has two functions. The first is to give the students an opportunity to learn the technical procedures in endodontic therapy through laboratory exercises which simulate clinical cases. The second is to introduce the students to the clinical management of lesions of endodontic origin through treatment of patients in the dental clinic facility.

**C&CD 475.2
Introduction to Implant Supported
Prosthodontics
2(1L)**

Introduction by lecture and laboratory assignments to the history of implantology, biology of osseointegration, indications and contraindications for implants, treatment planning, implant components, surgical placement of implant fixtures, and principles and procedures of implant prosthodontics.

**C&CD 517.4
Orthodontics
1&2(1L-5C)**

Orthodontic lectures in this year will continue to emphasize the diagnostic and treatment planning aspects of simple and

complex orthodontic cases, as well as provide insight into their treatment techniques and patient management. Content is mainly directed to various areas not previously covered or where a need for further in-depth study is indicated. The objective is to refine the final-year dental student's diagnostic abilities, and emphasis is directed at orthodontic case selection and treatment modalities as well as the multidisciplinary and ethical aspects of orthodontic dental treatment.

**C&CD 520.4
Operative Dentistry
1&2(1L-3C)**

This course consists mainly of routine general dental care of patients, providing the full range of restorative dental procedures including the examination, diagnosis and treatment of traumatic injuries to teeth as well as damage due to dental caries. More complex situations will be encountered and new materials and techniques included. Emphasis will be placed on independent and comprehensive dental care.

**C&CD 524.4
Pedodontics
1&2(1L-5C)**

This course continues the objectives and philosophy of Year 3 and adds a seminar format. The objective is to provide a format for review and discussion of certain advanced topics in pediatric dentistry, to discuss what is considered to be new in pediatric dentistry, to review interesting journal articles, and to present interesting cases which have been treated by students.

**C&CD 530.4
Removable Prosthodontics
1&2(1L-3C)**

Clinical practice in complete and removable partial dentures. Introduction to maxillofacial prosthodontics and dental implants.

**C&CD 540.4
Fixed Prosthodontics
1&2(1L-3C)**

Lectures, seminars and clinical practice in fixed prosthodontics with a strong emphasis on treatment planning and sequencing.

**C&CD 550.4
Endodontics
1&2(1L-3C)**

Students enhance their clinical skills by managing patients with endodontic problems on an increasingly independent basis. Conservative orthograde endodontic therapy is the treatment of choice; however, students are encouraged to observe the surgical management of endodontic lesions. Students should develop an appreciation of the varying degrees of difficulty associated with endodontic procedures, and an understanding of their own limitations in certain cases. The ability to review the literature critically and evaluate objectively new concepts and techniques should enter into their decision making. Lastly, the need for self-evaluation and continuing education is stressed.

FIVE YEAR D.M.D. PROGRAM

**C&CD 601.2 (Formerly C&P D 601)
Practice Management
1(1L)**

A continuation of C&CD 501. Topics include office administration, business and personnel management, financial planning, insurance, and the establishment and maintenance of a dental practice.

**C&CD 604.2 (Formerly R&P D 604)
Removable Prosthodontics
1(1L-3C)**

Seminar/discussion sessions in complete and partial dentures as well as clinical practice in complete and removable partial dentures. Introduction to maxillofacial prosthodontics and dental implants.

**C&CD 607.2 (Formerly C&P D 607)
Orthodontics
1(1L-5C)**

Orthodontic lectures in this year will continue to emphasize the diagnostic and treatment planning aspects of simple and complex orthodontic cases, as well as provide an insight into their treatment techniques and patient management. Content is mainly directed to various areas not previously covered or where a need for further in-depth study is indicated. The objective is to refine the final-year dental student's diagnostic abilities, and emphasis is directed at orthodontic case selection and treatment modalities as well as the multidisciplinary and ethical aspects of orthodontic dental treatment.

**C&CD 614.2 (Formerly C&P D 614)
Pediatric Dentistry
1(1L-5C)**

A seminar course in which papers will be presented on current topics and advanced problems or techniques relevant to Pediatric Dentistry. The clinical sessions will continue to allow the student to apply the principles introduced and become competent in the provision of dental care to children.

**C&CD 615.2 (Formerly R&P D 615)
Restorative Dentistry - Operative
Dentistry V
1(1L-3C)**

Selected seminar/discussion sessions when indicated to provide comprehensive view of practicing Operative Dentistry. In clinical training emphasis is placed on guiding students to formulate and apply a more independent approach in their practice of restorative dentistry.

**C&CD 625.2 (Formerly R&P D 625)
Fixed Prosthodontics
1(1L-3C)**

Class presentations and short essays on specific topics of interest. Clinical experience continues with the emphasis on more difficult treatment techniques and problem solving.

**C&CD 635.2 (Formerly R&P D 635)
Endodontics
1(1L-3C)**

A continuation of R&P D 535, the basis of which is the diagnosis and treating of endodontic problems of patients in the clinic. Conservative endodontic therapy will be the mode of treatment most routinely used; however, teaching instruction and

student observation of surgical management of endodontic lesions will be encouraged.

**C&CD 645.2 (Formerly R&PD 645)
Introduction to Implant Supported
Prosthodontics
1(1L)**

Introduction by lecture and laboratory assignments to the history of implantology, biology of osseointegration, indications and contraindications for implants, treatment planning, implant components, surgical placement of implant fixtures, and principles and procedures of implant prosthodontics.

COLLEGE SCHOLARS

College of Arts & Science

The guidelines for College Scholar individual research projects are described in detail at the beginning of "Programs" in the College of Arts & Science section. These courses credit only as electives. Please consult the Office of the Dean for more information.

COL SC 298.3
COL SC 299.6
COL SC 398.3
COL SC 399.6
COL SC 498.3
COL SC 499.6

COMMERCE

College of Commerce

Commerce courses in this section are listed under the following headings:

Accounting
Business Law
Finance
General Commerce Courses
Health Care Administration
Human Resource Management
Industrial Relations
Management
Marketing
Production and Operations Management
Quantitative Analysis
Taxation

For Honours seminar courses see the respective subject headings in the Courses section.

ACCOUNTING

Department of Accounting, College of Commerce

Permission of the Department of Accounting is required for all 300- and 400-level accounting courses. Students are advised not to take 400-level courses in accounting prior to their fourth year.

**COMM 201.3
Accounting and Business Decision
Making
1/2(3L)**

Helps the student understand, use and appreciate the limitations of information provided in an organization's financial statements. As such, the course examines

what financial statements are, what they include and the means of deriving information for and from them. Specifically, the course will enable the student to: (1) link the results of management's financing, investing and operating decisions to financial statement reporting; (2) understand the boundaries and limitations of information in the financial statements; (3) demonstrate a basic but real awareness of financial accounting systems; and (4) use information in financial statements to help make various decisions about an organization.

**COMM 301.3
An Introduction to Management Accounting for Future Managers
1/2(2L-1S)**

Prerequisite(s): COMM 201.

Introduces students to the important role that management accounting plays in contemporary organizations, where ideas such as quality, continuous improvement, customer focus and employee empowerment are commonplace. Students are exposed to the management accounting information that supports decision making, learning, planning and controlling activities—in both operational and strategic contexts. Mastery of technical accounting details is secondary to the need to understand the type of information that is appropriate in a given situation and how that information contributes to the management of the organization. Significant use of the case method is employed.

Note: This course is Restricted to students who are non-accounting majors. Students who have credit for COMM 302 may substitute COMM 302 for COMM 301.

**COMM 302.3
Introduction to Management Accounting
1(2L-1T)**

Prerequisite(s): COMM 104, COMM 201.

Corequisite(s): COMM 205.

An introduction to managerial accounting concepts and methods. This course exposes students to selected topics such as cost behavior, cost allocation, product costing, standard costing and variance analysis, budgeting, cost-volume-profit analysis, and pricing, and is based primarily on lectures and in-class problem-solving. A major budgeting assignment is included as part of the course, where students are expected to develop multi-period budgets under different scenarios.

Note: This course is restricted to accounting majors. Students who have credit for COMM 302 may substitute COMM 302 for COMM 301.

**COMM 308.3
Cost Management Systems
2(2L-1S)**

Prerequisite(s): COMM 302.

Corequisite(s): COMM 203.

A significant part of the course is devoted to providing students with an in-depth understanding of activity-based costing/activity-based management and their role in cost management. This will be complemented by examining topics such as target costing, kaizen costing and life-cycle cost management. Special attention will be paid to the implications on cost management systems of modern

management practices such as just-in-time manufacturing systems, total quality management, lean manufacturing and the theory of constraints.

Note: Students who have completed ACC 335 may not take this course for credit.

**COMM 321.3
Corporate Financial Reporting I
1(1L-2S)**

Prerequisite(s): COMM 201.

An intensive examination of professional pronouncements and practices regarding concepts, principles and procedures for recognizing, measuring and disclosing assets and related revenues and expenses which are presented in financial statements prepared for use by third parties. Within this knowledge base, skills regarding reading, analysis, diagnosis, evaluation and judgment are developed in a context of new and unfamiliar situations.

**COMM 323.3
Corporate Financial Reporting II
2(3L)**

Prerequisite(s): COMM 321.

A continuation of corporate financial reporting as described for COMM 321 but focusing on issues regarding liabilities and owners' equity and related revenues and expenses. Consideration is also given to cash flow analysis, the impact of various accounting methods on the reported results of a firm's activities, and interpretation of financial statements. Case assignments are used to develop teamwork and written and oral presentation skills.

**COMM 337.3
Business Information and Accounting Systems
1/2(3S)**

Prerequisite(s): COMM 308.

Study of the role of the accounting system in a total management information system. Deals with the major considerations involved in the design and installation of accounting systems. Cases in systems review and analysis concerning matters such as internal control evaluation, forms design, and flow charting are used extensively. Manual, mechanical, and electronic data processing techniques are investigated in relation to their use in accounting systems.

**COMM 412.3
Accounting Theory
1/2(1.5L-1.5S)**

Prerequisite(s): COMM 323.

A critical examination of contemporary problem areas in financial accounting theory. Selected topics are covered in depth. Panel discussions and debates are a vital aspect. Specific skill development focuses on how to learn and think creatively about accounting issues, develop reasoned positions and justification thereof, express criticisms in a constructive manner, improve written and oral communication abilities, and participate actively in discussions.

Note: It is highly recommended that students take COMM 412 and COMM 413 in the same term.

**COMM 413.3
Contemporary Issues in Accounting
1/2(3S)**

Prerequisite(s): COMM 323.

Examines various contemporary issues facing the "accounting profession". These issues are drawn from both the academic and professional accounting literatures. The course challenges students to develop (more) informed positions on these various issues, and exercises and improves their skills in critical thinking, persuasive writing, and effective oral communication. Class meetings take place in an interactive, "seminar-style" format and include the use of formal debates. Students must also submit term papers.

Note: It is highly recommended that students take COMM 412 and COMM 413 in the same term.

**COMM 421.3 Auditing - External
1/2(3L)**

Prerequisite(s): COMM 323.

Considers the demand for independent external audits, including environmental determinants (social, legal and professional) or individual auditor behaviour. The satisfaction of the demand for an audit is examined within a risk reduction expression of an auditor's opinion formulation process.

**COMM 433.3
Accounting for Equity Interests
1/2(1L-2T)**

Prerequisite(s): COMM 323.

Focuses on accounting and reporting issues associated with economic entities consisting of multiple parts. The simplifying assumption that corporations operate independent from other organizations is relaxed. Theory and practice related to accounting for business combinations, intercorporate investments, foreign currency denominated transactions and foreign investments will be examined. Accounting and reporting by not-for-profit organizations will be considered.

**COMM 438.3
Management Planning and Control Systems
1/2(3L)**

Prerequisite(s): COMM 308.

Corequisite(s): COMM 401.

Based primarily on the case method of instruction, this course provides students with a conceptual framework, an exposure to the component parts, and a systematic procedure so that they can begin to evaluate, design and implement management planning and control systems. Specific topics covered include: controlling discretionary expenditures, cost, profit and investment centres, transfer pricing, budgeting, performance measurement, innovation, compensation, and instilling ethical behavior in organizations.

BUSINESS LAW

Department of Industrial Relations and Organizational Behaviour, College of Commerce

**COMM 208.3
Introduction to Business Law
1/2(3L)**

An introduction to the general principles of law relating to contract and tort. Special contracts to be considered include agency, assignment, bailment, employment, guarantee, insurance, negotiable instruments, sale of goods, and contracts creating a security interest in goods. Some aspects of the law relating to real property, partnership and corporations will be discussed.

**COMM 404.3
Business Law
1/2(3L)**

Prerequisite(s): COMM 208.

Provides a more comprehensive examination of several of the topics surveyed in COMM 304. Special attention will be given to those aspects of the law relating to real property, negotiable instruments secured transactions, partnerships and corporations. Other topics include administrative law, wills, creditor rights (including bankruptcy) and trade practices.

FINANCE

Department of Finance and Management Science, College of Commerce

Permission of the Department of Finance and Management Science is required for all 300- and 400-level finance classes. COMM 203 is prerequisite to all senior finance courses in addition to prerequisites stated with each specific course description. Students are advised against taking 400-level finance courses prior to their fourth year. The department may not offer all the finance electives in any given year.

**COMM 203.3
Introduction to Finance
1/2(3L)**

Prerequisite(s): COMM 104.

Deals with the functions of the financial manager, including the problems and techniques of financial decision-making. Includes: goals of the firm; management of working capital; financial problems and decisions involving intermediate and long-term financing, capital budgeting under certainty and capital structure as it relates to weighted average cost of capital.

**COMM 329.3
Personal Finance
1/2(3L)**

Prerequisite(s): COMM 203.

Teaches the skills and techniques of personal financial planning. Topics include the financial life cycle hypothesis and other theories as they apply to individuals and families; the impact of taxation on financial plans; saving and investment planning; consumer credit and debt management; acquisition and sale of personal assets; life, health, accident, disability, auto and home insurance; leisure and recreation planning; personal bankruptcy and insolvency; retirement, wills and estate planning; and the preparation of personal financial plans.

**COMM 363.3
Intermediate Corporate Finance
1/2(3L)**

Deals with analytical techniques and theory of corporate finance. Covers investment and financing decisions including leasing, take-overs, corporate failures and reorganizations as well as other intermediate-level topics in the area of corporate finance. The concept of financial mobility is also emphasized.

**COMM 364.3
Risk and Insurance
1/2(3L)**

Deals with the concepts of risk, risk measurement and treatment, the various kinds of insurance including life, health and social security insurance; property and liability insurance; insurance institutions, contracts regulation; other topics include theft insurance; surety bonds, re-insurance, insurance and inflation, and business risk management.

**COMM 366.3
International Business Finance
1/2(3L)**

Prerequisite(s): COMM 363.

The problems, opportunities and questions confronting the financial management of multinational enterprises are analysed. Consideration is given to macro aspects of international finance including the problems of international liquidity and related institutional developments as inputs to the financial decision making of multinational enterprises.

**COMM 367.3
Security Analysis and Evaluation
2(3L)**

Prerequisite(s): COMM 363.

The principles and techniques of investing in securities are discussed. The material covers sources and analysis of investment information, evaluation of risks and returns associated with various investment instruments. Security analysis includes fundamental and technical approaches.

**COMM 419.3
Derivative Securities
1/2(3L)**

Prerequisite(s): COMM 363.

Deals selectively with the theories, strategies and applications of derivative securities. Topics include futures and forward contracts, swaps, standard options, exotic options and other derivative securities on different underlying assets; valuation techniques; empirical studies; governance and regulation of derivative securities trading and exposure; and management of financial risks.

**COMM 461.3
Theory of Finance
1(3L)**

Prerequisite(s): COMM 207 and 367.

Intensive treatment is given to selected areas in finance, including capital budgeting; cost of capital and capital structure; dividend policy; evaluation of growth and expansion of business firms; evaluation of portfolio performance.

**COMM 467.3
Portfolio Theory and Management
1(3L)**

Prerequisite(s): COMM 367.

Theory and practice of portfolio management for the purpose of selecting various financial instruments to meet the preference of investors. Topics include: diversification effects, evaluation of performance, timing for buying and selling financial instruments and use of computers, as applied to portfolio management.

**COMM 469.3
Management of Financial Institutions
2(3L)**

Prerequisite(s): COMM 367.

The managerial problems of some important financial institutions such as chartered banks, insurance companies, trust companies, mortgage and loan companies, pension funds, and investment companies; management techniques of assets and liabilities of these financial institutions; the regulatory environment. This course will be built around case discussion, lectures, and reading material on the latest issues in the management of the relevant financial institutions.

GENERAL COMMERCE COURSES

**COMM 101.3
Introduction to Business
1/2(3L)**

Successful enterprises must effectively integrate a variety of managerial processes and functions within the organization, while also maintaining effective relationships with key stakeholder groups. This course assists students to develop an understanding of the issues affecting business, the complex web of interrelationships involved in successfully dealing with these issues, and the organizational and managerial challenges involved in managing contemporary business organizations.

**COMM 102.3
Introduction to Business Management
1/2(3L)**

Note: May not be used for credit toward the B.Comm degree.

Examines the processes of management including environment and business analysis, planning, decision making, execution, and performance measurement. This course will make major use of case analyses, simulations, organizational audits or other forms of pedagogy that allow the student to assume the role of manager of the organization.

**COMM 109.0
Library Research I
Workshop**

Introduces students to the University of Saskatchewan libraries and to the wide variety of electronic resources available to them.

**COMM 110.0
Computer Skills**

Introduces students to the computer skills necessary to successfully use computers and software in upper year courses. Consists of three (3) modules: General Computing, Spreadsheets and Word Processing.

**COMM 209.0
Library Research II
Workshop**

Prerequisite(s): COMM 109 and 2nd year standing.

Introduce students to a variety of sources of industrial information including company reports, standard industrial classification schemes, statistical information and stocks and bonds.

**COMM 303.3
Government Policy
1/2(1.5L-1.5S)**

Prerequisite(s): Third year standing.

Introduces students to government structures and policy making processes. Included are the structure of governments (federal, provincial, municipal), the current political system and parties, market failures and potential solutions, opposing views on macro-economic policy in the context of current monetary and fiscal policy, government deficits and debt, and an overview of the world economic and social policies. Uses guest speakers to provide views from different perspectives such as business, labour, government, and other special interest groups. Current events and topics will be discussed and debated.

**COMM 305.3
Creative Thinking, Problem Solving
and Ethical Decision Making for
Managers
1/2(3S) (Not offered in 2002-2003)**

Prerequisite(s): Third year standing.

Examines the processes underlying creative thinking, decision-making and problem-solving by individuals and groups inside organizations. Students will study techniques for enhancing their skills, and will critically examine their own decision-making styles and their creative potential. A framework for the consideration of ethical issues in decision making will be described. Explores the particular problems of two-party negotiations and multiple-party decision making.

**COMM 309.0
Library Research III
Workshop**

Prerequisite(s): COMM 209.

Introduces students to primary and secondary materials relating to the Canadian legal system.

**COMM 492.3
Agribusiness Venture Management
1(1S-2P)**

Prerequisite(s): Required courses in Agribusiness Minor in Agriculture or Agribusiness Theme in Commerce.

Assists students in developing and understanding the skills and tools required to prepare and present a complete and professional business plan for a business entity in the agricultural industry. Agriculture and Commerce students are expected to combine knowledge and skills to produce an Agricultural business plan. This course serves as the capstone course for Agriculture students taking the Agribusiness Minor as well as the required course for Commerce students taking an Agribusiness Theme.

Note: Students may receive credit for only one of COMM 447 or 492.

**COMM 498.3
Special Topics
1/2(3S)**

Prerequisite(s): Permission of Department offering the class.

Develops students' awareness of a number of specialized topics of significance in the areas of specialization in the College of Commerce (Accounting, Marketing and Management, Finance and Management Science, Health Care Administration, General Business) through class discussion and individual research reports. Course content will vary, depending on when offered, student interests, and the instructor's interests.

HEALTH CARE ADMINISTRATION

Department of Management and Marketing,
College of Commerce

New applicants will not be admitted to this major nor will Health Care Administration courses be offered in 2002-2003.

**COMM 332.3
Introduction to Health Care
Administration
1(3L)(Not offered in 2002-2003)**

Introduces the student to the administrative structures of health care services in Canada and to the role expectations of different groups and organizations involved in the delivery of health care services.

**COMM 333.3
Health Agencies
2(3L)(Not offered in 2002-2003)**

Examines the pattern, structure and operation of the various components associated with modern health care delivery systems. The components examined include community health centres, hospitals, nursing homes, home care systems, and various other public health services.

**COMM 339.3
Field Project
3(P)(Not offered in 2002-2003)**

Prerequisite(s): COMM 333.

Provides students with the opportunity to analyse and develop solutions to actual problems in health administration. The student, now an administrative resident in a health care organization, works under the direction of a senior executive, called a preceptor. The professor assumes overall supervision for the students working under the daily direction of preceptors.

**COMM 434.3
Health Care Law and Ethics
1/2(3L)(Not offered in 2002-2003)**

Prerequisite(s): COMM 332 and 333.

Divided into three major sections. Section one provides a brief review of the Canadian Legal System and the specific portions which affect Health Care Organizations. Section two covers the legal concerns of patients and Health Care Professionals in the context of receiving treatment and negligence. Section three covers broad community-related issues which affect Health Care Organizations. Attention is paid throughout to the interconnection of ethical issues and legal issues.

COMM 436.3 Policy Formulation and Planning in Health Care Administration 1/2(3S)(Not offered in 2002-2003)

Prerequisite(s): COMM 333.

Deals with program and service planning in health care institutions at the institutional, community and regional levels, determination of needs, setting of priorities, the planning process, implementation of evaluation.

HUMAN RESOURCE MANAGEMENT

Department of Industrial Relations and Organizational Behaviour, College of Commerce

COMM 202 is prerequisite for all courses in this area in addition to those stated with each course.

COMM 202.3 Introduction to Organizational Behaviour 1/2(3S)

Introduces various behavioural concepts and tools that will assist the administrator in both understanding behaviour in organizations and enhancing organizational effectiveness. Topics include the role of the administrator, schools of management thought, forces affecting employee and work group behaviour, leadership and supervision, interpersonal and organizational communication, and organizational change.

COMM 342.3 Organization Structure and Design 1/2(3S)

Prerequisite(s): COMM 202.

Completes the introduction to organizational behaviour begun in COMM 202 by providing and understanding of the theory, research, and managerial choices relevant in structuring, designing, and maintaining effective organizations. A contingency approach will be used to examine the influence of factors such as environment, goals and strategy, and technology on the structure and behaviour of organizations. Methods for organization development and change will also be introduced and discussed.

COMM 348.3 Human Aspects of Administration 1/2(3S)

Prerequisite(s): COMM 202.

Extended coverage of topics covered in COMM 202 with a focus on leadership. Uses various media to examine theories of and issues in leadership in organizations. Cases, role playing and seminars are used to provide practical exposure to leadership issues and problems.

COMM 382.3 Employment Law 1/2(3L)

Deals with four major statutes and public policies comprising employment law: Employment Standards, Human Rights, Occupational Health and Safety, and Workers' Compensation legislation.

COMM 384.3 Workplace Health & Safety 1/2(3L)

Prerequisite(s): COMM 206 or permission

of the instructor.

Acquaints students with the full-scope of job-related safety and health hazards, the key institutions and their responsibilities including government, industry, labour medical/scientific, and industrial engineering. Historical and economic developments, enforcement and compliance will be reviewed. Special emphasis will centre on the element of an effective workplace health and safety program.

COMM 386.3 Personnel Management 1/2(3L)

Prerequisite(s): COMM 202 and 206.

Primarily concerned with the problem of staffing large organizations. Topics include procurement; employee interviewing, testing and placement; wage and salary administration; and other topics pertinent to the personnel management function.

COMM 388.3 Compensation 1/2(2L-1P)

Prerequisite(s): COMM 206.

Deals with compensation theory and practice. Topics include job evaluation, wage surveys, performance evaluation, incentive systems, benefits and legal concerns in developing and administering compensation systems in organizations. The course's primary focus is a major project involving students in designing a compensation plan for an organization.

COMM 402.3 Management Skills 1/2(3S)

Prerequisite(s): Open to Commerce students in their graduating year.

This course focuses on the skills managers require to effectively "get things done" in organizations. The course concentrates on ten skills that research identifies as those most frequently associated with effective managers: verbal communication, managing time and stress, motivating and influencing others, delegating, setting goals and articulating vision, self-awareness and empathy, team building, managing conflict, problem recognition and problem solving and managing individual decisions. Skill learning will involve some lectures, but will focus primarily on student involvement through cases, exercises and role playing.

COMM 441.3 High Involvement Work Systems 1/2(3S)

Prerequisite(s): COMM 202.

Examines the various elements for creating high involvement work systems including job and task redesign, ergonomics, self-managed work teams, participative management, financial participation, joint labour-management committees, joint consultation through worker councils or board representation and employee ownership. The evidence on the consequences of each of the elements will be assessed, and implementation issues will be examined.

INDUSTRIAL RELATIONS

Department of Industrial Relations and Organizational Behaviour, College of Commerce

COMM 206 is prerequisite for all courses in this area in addition to those stated with each course.

COMM 206.3 Employment and Industrial Relations 1/2(3L)

Investigates an array of perspectives of industrial and employment relations in work organizations. Examines the economics, political and social forces affecting the actors in these settings including the institutional framework affecting their practices and stresses the phenomenon of collective action as revealed through union and management strategies.

COMM 383.3 Industrial Relations and Labour Markets 1/2(3S)

Prerequisite(s): COMM 206.

A critical analysis of the economic foundation of trade unions and industrial relations. Major topics include the sources of union power, trade union wage policy, economic effects of trade unions, and income policy and collective bargaining.

COMM 387.3 Labour Law 1/2(3S) (Not offered 2002-2003)

Prerequisite(s): COMM 206.

Introduction to the collective bargaining policy, and particularly the Saskatchewan Trade Union Act and major labour relations board rulings. Rights arbitration will also be covered.

COMM 481.3 Collective Bargaining 1/2(3S)

Prerequisite(s): COMM 206.

Provides students with an understanding of the structures, processes and dynamics of collective bargaining. Among other topics it addresses dispute resolution mechanisms and current bargaining issues. Contains a bargaining simulation exercise.

COMM 485.3 Comparative Industrial Relations Systems 1/2(3S)

Analyses the collective bargaining process by a comparison of the history, structure and function of labour organizations, primarily in the Western democracies. However, some attention will be paid to the roles of trade unions, employers and the state in developing countries and in the countries making the transition from centralized state planning.

MANAGEMENT

Department of Management and Marketing, College of Commerce

Third year standing in the College of Commerce is required to enroll in all Management courses.

COMM 340.3 Introduction to International Business 1/2(3L)

Introduces the student to the global setting in which international business decisions are made. In addition to the basic economic factors, socio-cultural, legal, and political considerations are examined. Emphasis is placed on the factors which are relevant to decision-making in a wide range of international business functions (e.g. marketing, finance) and international business forms (e.g. export-import, foreign manufacturing, joint ventures).

COMM 345.3 Business and Public Policy 1/2(3S)

Considers various areas of government activities which affect business decision-making and considers their impact on management decision-making.

COMM 346.3 The Commercialization of Biotechnology 1/2(1.5L-1.5S)

Prerequisite(s): 60 credit units of university or 3rd year standing, with priority given to students registered in the Biotechnology program.

This course provides a practice oriented bridge between the laboratory and the world of commerce. It examines the theory and practice of launching new business ventures in the biotechnology industry. Practicing biotechnology managers, entrepreneurs and special advisors will describe their activities and experiences in a series of industry seminars.

COMM 401.3 Business Policy I 1/2(3S)

Prerequisite(s): Open to Commerce students in their graduating year.

An integrative course which focuses on the functions and responsibilities of senior management. Deals with the concept of organizational strategy and how it is formulated, developed and implemented in actual situations.

COMM 446.3 Applications of Management Theory 1/2(3S)

Prerequisite(s): Permission of the instructor.

Examines applied management in a variety of contexts, building upon a core of management strategy theory. The creation of business plans and competitive strategies as solutions to business problems will develop managerial, interpersonal and leadership skills. The course will also facilitate the participation of a proportion of registered students in various intercollegiate business competitions.

COMM 447.3 Entrepreneurship and Small Business Management 1/2(1S-2P)

Prerequisite(s): Fourth-year standing in College of Commerce.

Examines the processes involved in and skills required for the successful formation of new business ventures and the on-going

management of small businesses. Students can examine their own entrepreneurial potential and experience the process of new venture formation and financing through the preparation and formal presentation of a plan for the initiation of a business venture of their own choice.

Note: Students may receive credit for only one of COMM 447 or 492.

**COMM 490.3
Field Study in Management**

Provides students with an opportunity to execute an in-depth investigation of a topic of special interest to management within a different cultural environment. The venue or the country where the student will be stationed may vary with each offering.

MARKETING

Department of Management and Marketing,
College of Commerce

Permission of the Department of Management and Marketing is required for all 300- and 400-level marketing courses. COMM 200 or COMM 204 is prerequisite for all other courses in marketing. Additional prerequisites are stated with each course.

**COMM 200.3
Introduction to Agribusiness
Marketing
1/2(3L)**

Provides students with an introduction to the principles and concepts of marketing as applied to the agribusiness industry. In this context, business activities are analyzed from the point of view of recognition, stimulation and satisfaction of customer demand. Specific topics include market segmentation, consumer behavior, marketing mix strategies, marketing research and marketing ethics. Agribusiness cases and examples are extensively used to illustrate effective marketing principles, strategies and practices.

Note: This course is an alternative to COMM 204 and students will not receive credit for both COMM 200 and 204.

**COMM 204.3
Introduction to Marketing
1/2(3L)**

Introduces the student to the marketing concept in business. Business activities are analysed from the point of view of recognition, stimulation and satisfaction of consumer demand.

Note: Students will not receive credit for both COMM 200 and 204.

**COMM 352.3
Marketing Analysis and Planning
1/2(2.5S-5P)**

Corequisite(s): COMM 301.

Concentrates on the development of marketing strategies. An operational framework is built for analysing the marketing environment and for selecting among strategic alternatives. Case analyses predominate.

**COMM 354.3
Consumer Analysis
1/2(3S)**

Considers factors influencing consumer behaviour as a focal point of marketing decision making. Topics include market segmentation and positioning, environmental and individual determinants of consumer behaviour and consumer decision processes. This material is analysed for its usefulness in designing, evaluating and implementing marketing strategies.

**COMM 357.3
Marketing Research
1/2(2S-1P)**

Corequisite(s): COMM 207.

Examines the principles and procedures associated with the collection and analysis of relevant information in the context of solving practical marketing problems. Students have the opportunity to apply these principles at each stage of the marketing research process: problem definition, research design, data collection, data analysis, and report preparation.

**COMM 450.3
Current Issues in Marketing
1/2(2S-1P)**

Prerequisite(s): COMM 352.

Deepens the student's understanding of a specialized area in the field of marketing. Potential topics include marketing of agricultural products, business to business marketing, management of the sales forces, the impact of new technology on marketing practice, and advanced marketing research. Students are advised to contact the instructor of the department office for more specific details.

**COMM 451.3
Marketing Communication
1/2(2S-1P)**

Prerequisite(s): COMM 352 and 354 or permission of Department.

Introduces students to the basic concepts which underlie the promotional activities of the firm. The concept of the promotional mix is introduced and the proper strategic roles for advertising, personal selling and sales promotion are discussed in the context of the findings of communication theory.

**COMM 452.3
Services Marketing
1/2(2S-1P)**

Prerequisite(s): COMM 352.

Considers the unique marketing issues and problems facing service organizations. Issues considered include the role of the client, quality in service organizations, demand management and pricing problems. Within the overall context of the service sector the course also considers marketing issues related to health care and non-profit organizations.

**COMM 453.3
Marketing Logistics Management
1/2(3S)**

Prerequisite(s): COMM 352.

Focuses on the physical distribution element of the marketing mix. Deals with the cost and value added to products or services by making them available in the desired condition when and where they are

needed while making the greatest contribution to the firm. Major topics include transportation, inventory levels, processing customer orders, warehousing, packaging, facility location, materials handling and other activities directed to the achievement of customer service standards.

**COMM 455.3
Marketing Strategy: Implementation
and Control
1/2 (3S) (Not offered in 2002-2003)**

Prerequisite(s): COMM 352.

Focus is on practical studies of how marketing strategies get accomplished in representative market situations. Emphasis is on the how-to-do of strategy formulation. Sharpens student understanding and appreciation for the organizational component of marketing: the human resources, processes, and analytical issues relevant to the implementation of marketing programs and the execution of strategy. Examines issues involved in implementing marketing strategies by focusing on the allied areas of marketing programs, sales management, and marketing organization and control.

**COMM 456.3
International Marketing
1/2(3S)**

Prerequisite(s): COMM 340.

Examines the managerial aspects of international marketing activities of the firm. The various decision areas in marketing including marketing research, product policy, pricing, distribution, and promotion are considered in an international context. Also presented are the problems relating to the formulation and implementation of an integrated marketing plan for the firm's international operations.

**COMM 459.3
Management of Marketing Channels
1/2(3S)(Not offered in 2002-2003)**

Prerequisite(s): COMM 352.

Examines the activities and technologies associated with the distribution of goods and services from both societal and managerial perspectives. Topics include design and management of channels, distribution systems including franchising, shopping centres and other types of institutions. Various topics related to retail management are also considered.

**PRODUCTION AND OPERATIONS
MANAGEMENT**

Department of Finance and Management
Science, College of Commerce

**COMM 205.3
Introduction to Production and
Operations Management
1/2(3L)**

Prerequisite(s): COMM 104.

Introduction to elements and decision-making tools in production and operations management including product and service design, location planning, process selection and capacity planning, facility lay-out, design of work systems, aggregate planning, inventory management, materials requirement planning, just-in-time systems, scheduling, project management, waiting lines, and quality assurance.

Note: Students with credit for QUANT 391 or POM 391 may not take this course for credit.

**COMM 393.3
Management Science
1(3L)**

Prerequisite(s): COMM 104.

Introduction to selected quantitative decision-making tools used in management. Topics covered are linear programming, transportation and assignment problems, integer and goal programming, network models, simulation, decision analysis and dynamic programming. Use will be made of available computer programs.

Note: Students with credit for QUANT 393 or POM 393 may not take this course for credit.

**COMM 395.3
Business Forecasting
2(2.5L-5S)**

Prerequisite(s): COMM 104.

The process of business forecasting involves the study of historical data to discover their underlying tendencies and patterns and the use of this knowledge to project the data into future time periods as forecasts. Topic areas include moving averages and exponential smoothing methods including Holt's and Winter's models, regression analysis, multiple regression including validation of model, selection of the best model and seasonal analysis, time series analysis, regression of time series data, Box-Jenkins (ARIMA) methodology, and judgmental elements in forecasting. The approach will involve less mathematical exposition and more applications of forecasting in business using mini cases. Use is made of available computer programs.

**COMM 491.3
Purchasing and Materials
Management
1(3L)**

Prerequisite(s): COMM 205.

Introduction to concepts and techniques applied in industrial purchasing and materials management. The purchasing topics include operating procedures, supplier selection, price determination, bidding and negotiation, cost and value analysis, and supplier relations and partnerships. The materials management topics include production planning and control, inventory control systems and models including distribution inventory systems, and materials handling and warehousing.

Note: Students may receive credit for only one of COMM 447 or 492.

**COMM 493.3
Total Quality Management
1(3L)**

Prerequisite(s): COMM 205.

Basic concepts of total quality control, strategic quality planning, quality value and engineering, loss function and quality level, statistical process control, management of process quality, quality and operation results, Taguchi methods, preventive maintenance, other aspects of quality management.

COMM 495.3 Business Logistics Modelling 2(3L)

Prerequisite(s): COMM 205.

Business logistics deals with the distribution of goods and services. In the past this area has mainly been interested in the physical distribution, transportation, materials' storage and handling, production scheduling, order processing, and warehousing decisions surrounding physical commodities. However, in the service section and knowledge-based industries, the distribution function revolves around information systems and computer networks such as the Internet. This course attempts to explore these issues and to develop the models required to analyse the distribution of both physical and information commodities. Computer modelling and the Internet will also be used to investigate these logistical decisions.

QUANTITATIVE ANALYSIS

Department of Finance and Management Science, College of Commerce

COMM 104.3 Statistics I 1/2(3L)

Prerequisite(s): MATH 110.

Descriptive statistics, index numbers, probability concepts, probability distributions, sampling distributions, statistical inference - estimation and hypothesis testing. Introduction to time series forecasting (moving averages and exponential smoothing).

COMM 207.3 Statistics II 1/2(3L)

Prerequisite(s): COMM 104.

Chi-square contingency test, goodness-of-fit tests. Analysis of variance, simple linear regression and correlation. Multiple regression and correlation. Nonparametric statistics, statistical decision theory, some statistical applications in quality control.

TAXATION

Department of Accounting, College of Commerce

Permission of the Department of Accounting is required for all 300- and 400-level taxation courses.

COMM 405.3 Taxation - Taxation and Business Decisions 1/2(3L)(Not offered in 2002-2003)

Prerequisite(s): Fourth-year standing.

Students acquire an understanding of the fundamentals of the Canadian tax system and its impact on business and personal decision-making. The Canadian income tax structure is examined, a theory for tax planning is developed, and specific tax planning topics are discussed.

Note: Students may receive credit for only one of COMM 405.3 or COMM 406.3

COMM 406.3 Taxation - Liability for Tax and Computation of Net Income 1(3L)

Prerequisite(s): COMM 321.

Exposes students to the technical provisions of the Income Tax Act and their interpretation and application. In particular, the course examines the liability for tax and the computation of net income for tax purposes. Emphasis is placed on learning how to read, understand and apply the legislation itself. Students are also introduced to the skills necessary to research a tax issue.

Note: Students may receive credit for only one of COMM 405.3 or COMM 406.3

COMM 407.3 Taxation - Individual and Corporate Taxes Payable and Tax Planning 2(3L)

Prerequisite(s): COMM 321, COMM 406.

Further exposes students to the technical provisions of the *Income Tax Act*, with continued emphasis on learning to read the legislation with understanding. In particular, the course examines the determination of taxable income and taxes payable for individuals and corporations, the application of the provisions of the *Act* to various business situations and reorganizations, as well as tax planning issues related to these topics. Students are given the opportunity to further develop their tax research skills.

COMMUNITY HEALTH AND EPIDEMIOLOGY

Department of Community Health and Epidemiology, College of Medicine

These courses are restricted to students enrolled in the College of Medicine.

CH&EP 190.3 Northern Health Issues

Prerequisite(s): Biology 30.

CH&EP 390.3 Research Methodology in Health Sciences I

CH&EP 392.3 Research Methodology in Health Sciences II

These form part of the B.Sc.(Med.) program. One of the above will be held each summer. Topics include design of clinical trials, experimental design, research statistics, evaluation of literature, ethics of experimentation, computer applications and research, scientific writing for publication and for grant application, writing and presentation of scientific papers.

CH&EP 401.6 Community Health and Epidemiology PC

Provides a population perspective to health and the prevention and treatment of illness. It concentrates on the public health knowledge, skills and attitudes which all doctors will require in their professional careers. An understanding of epidemiology

and biostatistics is essential for the evaluation of services, critical appraisal of the literature, and participation in research.

CH&EP 402.3 International Health

Provides an introduction to international health within a framework of people-centered development and primary health care. The course links health and development issues that are common overseas and in Saskatchewan. Students are introduced to patterns of disease, the context in which they occur, and strategies and actions for enhancing well-being. Related aspects of gender, ecology, education, indigenous beliefs and practices, economic and political systems, and foreign aid are explored.

GRADUATE COURSES

Department of Community Health and Epidemiology, College of Graduate Studies & Research

CH&EP 800.3 Epidemiology I (1.5L-1.5S)

Introduces the basic epidemiologic methods used to evaluate the distribution and determinants of disease. Includes both lectures and interactive seminars to provide students with practical experience in epidemiologic problem-solving. Examples will be drawn from the fields of both communicable and non-communicable disease.

CH&EP 801.3 Epidemiology II (1.5L-1.5S)

Prerequisite(s): CH&EP 800; or equivalent and 3 credit units in statistics.

Advanced concepts of epidemiologic theory and methods. Advanced biostatistical techniques will be applied to a series of epidemiologic problems from the fields of communicable and non-communicable disease.

CH&EP 802.3 Community Health & Epidemiology Research Seminar (1L-2S)

Prerequisite(s): CH&EP 800; or equivalent.

Provides experience in the practical application of epidemiology and biostatistical principles to a specific research question. Students develop a detailed research protocol on a subject of their choice.

CH&EP 803.3 Health Promotion (3S)

Prerequisite(s): Registered graduate student in Community Health and Epidemiology; or permission of the instructor.

An introduction to theory, research, and practice in health promotion. Topics include: empowerment, constructivist and naturalist approaches, change in individuals, small group development, community development, healthy public policy, coalition-building and advocacy, linking research and action.

CH&EP 804.3 Community Health Issues (1-2L)(1-2S)

Provides an overview of the field of community health, including health care organization and community-based approaches to health promotion and disease prevention.

CH&EP 805.3 Biostatistics (3L)

Prerequisite(s): STATS 244, 245; or equivalent.

Designed for life sciences students who wish to understand and apply commonly used advanced statistical methods which they are likely to encounter in their career. The emphasis is on the appropriate application of these research methods and the correct interpretation of their results.

CH&EP 807.3 Health program planning and evaluation (3S)

Prerequisite(s): CH&EP 804.3 (Community Health Issues) or permission of instructor.

Covers basic concepts and principles of the cycle of health program planning, which includes needs assessment, program development and implementation, process, impact, and outcome evaluation. Both qualitative and quantitative data collection will be addressed. Guest speakers, case studies, and assignments will link conceptual material with concrete applications.

CH&EP 898.3 Special Topics

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

CH&EP 990 Seminar

A seminar is held periodically throughout the regular session during which current issues in research and practice are discussed. Graduate students are required to attend the seminars.

CH&EP 994 Research

Students writing a Master's thesis must register for this course.

COMPUTER SCIENCE

Department of Computer Science, College of Arts & Science

CMPT 100.3 Introduction to Computing 1/2(3L-1.5T)

Prerequisite(s): Mathematics A30 or B30 or C30 (or, under the old mathematics curriculum, Algebra 30 or Geometry-Trigonometry 30 or Mathematics 30).

A survey of major computer science areas, combining a breadth of topics with depth via specific examples within each topic. Topics include: history of computing, computer applications, analysis and design, high level programming, computer software, computer

hardware, artificial intelligence, and the social impact of computers.

Note: Students wishing to major in computer science are advised to take either CMPT 111 or 112. Students majoring in computer science may not use CMPT 100 as a course in their major, but may count it as a junior elective as long as CMPT 100 is taken before CMPT 115. Students may not take CMPT 100 for credit concurrent with or following CMPT 115.

**CMPT 101.3
Introduction to Programming
2(3L-2P-1T)**

Prerequisite(s): CMPT 100 or equivalent. Introduces the student to programming. Includes algorithm development, programming in a high-level language and algorithm analysis. Other fundamental concepts of computer science, such as recursion, file processing, and data structures will be discussed. Students will also be introduced to a variety of software packages.

Note: Cannot be taken for credit by students intending to major in computer science.

**CMPT 111.3
Computer Programming and
Algorithmic Analysis
1/2(3L-2P-1T)**

Prerequisite(s): Mathematics B30 (or, under the old mathematics curriculum, Algebra 30 and Geometry-Trigonometry 30).

Introduces some of the basic concepts of computer science through the study of the fundamentals of algorithms, traditional elementary programming and algorithm analysis.

Note: Designed for students with little or no experience with computers who want to be introduced to the fundamental concepts of computer science. Students may not receive credit for more than one of CMPT 111, 112, 116 or 122.

**CMPT 112.3
Design and Analysis of Computer
Programs
1(3L-2P-1T)**

Prerequisite(s): Mathematics B30 (or, under the old mathematics curriculum, Algebra 30 and Geometry-Trigonometry 30).

Introduces some of the basic concepts of computer science by reviewing fundamentals of algorithms and traditional elementary programming and studying algorithm analysis, computing machines and simulation.

Note: Designed for students with experience in using a high level structured or functional programming language such as Pascal. Students without such a background who are considering registering for the course should consult with the department or register for CMPT 111. Students may not receive credit for more than one of CMPT 111, 112 and 116 (122).

**CMPT 115.3
Principles of Computer Science
2(3L-1.5T)**

Prerequisite(s): CMPT 111 or 112.

Introduces more of the basic concepts of computer science through a study of information systems, artificial intelligence,

languages and grammars, numerical analysis and computability.

Note: Students with credit for CMPT 117 or 123 may not take this course for credit.

**CMPT 116.3
Computing I
1(3L-1.5T)**

Prerequisite(s): Mathematics B30. Restricted to students in Physics and Engineering.

Gives the fundamentals of programming, including functions, procedures and arrays. It introduces object-oriented programming and GUI components. Also some basic numerical methods and engineering applications are presented.

Note: Students who have credit for this course may not receive credit for CMPT 111 or 112.

**CMPT 117.3
Computing II
2(3L-1.5T)**

Prerequisite(s): CMPT 116. Restricted to students in Physics and Engineering.

Continues the development of programming skills started in CMPT 116, with an emphasis on object-oriented programming. Data structures for the storage and efficient retrieval of information will be studied and analyzed, in particular stacks, queues, linked lists and simple binary trees. Examples and exercises will be drawn from engineering applications and numerical methods.

Note: Students who have credit for CMPT 123 may not take this course for credit.

**CMPT 215.3
Introduction to Computer
Organization and Architecture
(Formerly 230)
1(3L-1.5T)**

Prerequisite(s): CMPT 115 or 123, and a first-year calculus course.

An introduction to the hardware and software structure of contemporary computer systems. Topics include internal number representation, assembly and machine languages, input-output devices and their management, basic CPU operation, memory systems, computer organization, computer architecture, systems software, and data communication.

Note: A student cannot receive credit for both CMPT 212 and CMPT 215. Students seeking a computer science degree should take CMPT 215.

**CMPT 220.3
Introduction to Digital Systems
Design
2(3L-1.5T)**

Prerequisite(s): CMPT 215. CMPT 260 is recommended.

The following aspects of digital systems design will be discussed: binary and multiple-valued logic algebras, combinational logic design and minimization techniques, design of arithmetic circuits, implementation of digital systems using random and array structures, sequential logic design, finite-state machines, register transfer machines, and simple control unit design.

Note: Students with credit for E E 310 or E P 321 may not take this course for credit.

E E 310 or E P 321 can be used to meet the requirement for CMPT 220.

**CMPT 250.6
Analysis of Data and Language
Structures
1&2(3L-1.5T)**

Prerequisite(s): One of CMPT 115, 117, or 123, and a first-year calculus course.

A continuation of CMPT 115 or 123. Further language and data structure as well as object oriented programming and design. Algorithm analysis techniques are used to compare algorithms. The topics include trees, graphs, referencing environments, storage management, sorting and searching, file structures.

**CMPT 260.3
Mathematical Logic and Computing
1(3L-1T)**

Prerequisite(s): CMPT 115 or 123, and a first-year calculus course.

Focuses on elementary applied logic and set theory and relates these concepts to a variety of computer science areas such as syntactic analysis, relational databases, logic programming, artificial intelligence, and formal program verification.

**CMPT 275.3
Organizational Information Systems
1(3L)**

Prerequisite(s): CMPT 100. Restricted to students enrolled in the College of Commerce.

Studies the development of information systems in organizations. The development life cycle of information systems is used as a framework for studying the management of systems development and the evaluation of opportunities for improving information systems within organizations.

Note: This class may not be taken for credit at the same time or subsequent to CMPT 250 or CMPT 370. Also, this course cannot be part of a major in Information Systems Development, or a major in Computer Science in the College of Arts & Science.

**CMPT 317.3
Introduction to Artificial Intelligence
2(3L-1T)**

Prerequisite(s): CMPT 250 and 260.

A survey of Artificial Intelligence techniques and underlying theory. Topics include knowledge representation techniques, heuristic search, expert systems, and expert system shells, and a tour of various application areas of Artificial Intelligence including machine learning, natural language processing and high-level computer vision.

**CMPT 321.3
Computer Design and Architecture
2(3L-2P)**

Prerequisite(s): CMPT 220, or CMPT 215 and either E E 310 or E P 321.

Design of computers using top-down approach. Topics include data path, control logic, use of hardware description, languages, and evaluation of computer architectures.

**CMPT 330.3
Systems Programming and
Introduction to Operating Systems
1/2(3L-3T)**

Prerequisite(s): CMPT 215 and 250.

Concentrates on the systems software level of modern operating systems. Topics include booting, trapping, process abstraction, device I/O and file systems, networks and distributed services, command interpreters, facilities for multiprogramming, system administration, and instrumentation and measurement. Hands-on experience is emphasized. Students will become proficient with a current systems programming language.

**CMPT 340.3
Programming Systems and
Languages
1/2(3L-2T)**

Prerequisite(s): CMPT 250 and 260. CMPT 215 or 212 is also recommended.

A survey of programming languages and computing paradigms followed by a deeper study of two or more less familiar paradigms such as functional programming, logic programming, applicative, algebraic and object-oriented languages. Semantic models, including predicate logic, lambda calculus or axiomatic semantics (program verification). Other language issues include implementation methods such as interpretation versus compilation, variable-scoping, nondeterminism.

**CMPT 360.3
Machines and Algorithms
1(3L)**

Prerequisite(s): CMPT 250 and 260, MATH 112 or 116, and 3 credit units in 200-level MATH or STATS (excluding STATS 244).

The first part develops and analyzes some standard techniques for algorithm development which are widely applicable to computer science problems. The second part analyzes several models of computers so that their capabilities are known.

**CMPT 361.3
Intractable Problems and Models of
Computation
2(3L)**

Prerequisite(s): CMPT 360.

Problems which have no known efficient solution are studied; exact inefficient algorithm design techniques are introduced, as are efficient approximation algorithms. NP-completeness proofs are developed as evidence of intractability. Part of the course is a rigorous and systematic introduction to models of computation via formal language theory.

**CMPT 370.3
Systems Analysis and Design
1(3L-1.5T)**

Prerequisite(s): CMPT 250.

The development life cycle of software systems is studied, with emphasis on the principles and techniques used in analysis and general design. Alternate approaches such as iterative development and prototyping are also studied. Introduces the principles involved in cost-benefit analysis and project management. The methods discussed are applicable to all forms of

software, including information systems, scientific systems, hypermedia systems, and real time systems. Individual assignments and one group assignment are required, using a suitable language.

**CMPT 371.3
Systems Design, Implementation
and Maintenance
2(3L-1.5P-1.5T)**

Prerequisite(s): CMPT 370.
The study of the development life cycle of software systems continues, with emphasis on the principles and techniques used in detailed design, implementation and maintenance. Particular attention is paid to project management, requirements specification, object-oriented sign, software quality assurance, and software verification and validation. The evolution of metrics to assist in controlled development is discussed throughout the course. Exposure to CASE and project management software is provided.

**CMPT 374.3
Theory and Application of Data Bases
1/2(3L-1T)**

Prerequisite(s): CMPT 250, 260.
Lectures, assignments and projects dealing with the management, storage, and retrieval of large volumes of data. Concentrates on the relational data model, and relational data base management systems. Topics include: recovery and concurrency, integrity and security, query optimization, normalization, and semantic modelling. Additional topics include multimedia databases and other paradigms.

**CMPT 393.3
Operations Research
1(3L)**

Prerequisite(s): CMPT 111, 112 or 122; STATS 241 or 245 or G E 210 (preferably STATS 241) and MATH 264 or 266 or C E 318 or E E 326 or permission of the department. The statistics course may be taken concurrently.
History and methodology of operations research. Mathematical programming techniques including linear programming, network analysis, dynamic non-linear optimization. Probabilistic models including queuing models, inventory models and simulation. Applications of operations research techniques and models.

Note: A student cannot receive credit for CMPT 393 and any one of QUANT 393, POM 393 or COMM 393.

**CMPT 394.3 (Formerly 398)
Simulation Principles
2(3L)**

Prerequisite(s): CMPT 115, STATS 242 or 245 (preferably 242, which may be taken concurrently).

Introduction to the development of logical, numerical and statistical models of systems; deterministic and probabilistic models; Monte Carlo simulations. Basic elements involved in simulation such as entities, attributes, events and time representation. Properties of computer modelling languages; design, development and testing of models.

Note: Students with credit for CMPT 398 may not take this course for credit.

**CMPT 400.3
Research Topics in Computer Science
1&2(1.5S)**

Prerequisite(s): In the final year of an Honours Program, or a cumulative percentage average of at least 70% in 24 credit units in computer science and written permission of the department.
Senior students will be introduced to research in an advanced area of computer science under the supervision of a faculty member specializing in the area.

**CMPT 401.0 Professional Internship 1
CMPT 402.0 Professional Internship 2
CMPT 403.0 Professional Internship 3
CMPT 404.0 Professional Internship 4**

Prerequisite(s): Professional Internship placement with a sponsoring employer, and approval of the department.
Internship students register in one of these zero-credit-unit courses for each four-month installment of the 16 month internship placement. The initial four-month period is probationary, and satisfactory completion of each course is required prior to registration in the next course. Each course is graded on a Pass/Fail basis.

**CMPT 405.3
Project Design and Implementation
1&2(1.5P-1.5S)**

Prerequisite(s): 24 credit units in computer science and permission of the department.
Senior students apply engineering and scientific methods to develop a major computer system or system component. Students work individually or in teams and are supervised by a faculty member specializing in the area. Students prepare and present interim and final reports on their project.

**CMPT 409.3
Professional Internship 5
1&2(1.5S)**

Prerequisite(s): CMPT 401, 402, 403, 404, or equivalent, or special permission of the department.
This 3 credit-unit two semester course allow internship students to share their internship experience with other students, through written and verbal reports, as well as to apply and build upon their experience through participation in suitable peer mentoring activities.

**CMPT 416.3
Advanced Algorithms
2(3L)**

Prerequisite(s): CMPT 360.
A continuation of the algorithms part of CMPT 360. Some of the algorithm techniques include: augmenting algorithms for network flows, matching and graph connectivity, geometric algorithms for nearest neighbour, intersection problems, and convex hull; parallel and distributed algorithms.

**CMPT 417.3
Knowledge Representation and Reasoning
1(3L)**

Prerequisite(s): CMPT 317, one of CMPT 340 or 360.
An introductory study of logic-based approaches to knowledge representation

and automated reasoning. Topics include search techniques, constraining satisfaction problems, meta-programming, truth maintenance systems, modal logics, and situation calculus. Besides these logic-based approaches, we will also discuss uncertainty formalisms such as probabilistic causal nets and the Dempster-Shafer theory.

**CMPT 421.3
Introduction to VLSI Systems
1(3L)**

Prerequisite(s): CMPT 321.
Emphasizes the design and issues of VLSI-based systems, analysis of subsystems design approaches, specialized VLSI chips design, and VLSI impact on architectures. Topics include: MOS technology, CMOS circuit and logic design, array structures, subsystem design, system design aspects, and new trends in VLSI design.

**CMPT 422.3
Principles of Operating Systems
2(3L)**

Prerequisite(s): CMPT 330.
An introduction to the principles of modern operating systems. The synchronization and communication of cooperating processes. Virtual memory. The sharing of resources. Design methodology.

**CMPT 424.3
Computer Network Technologies and Analysis
1/2(3L)**

Prerequisite(s): CMPT 220 (or E E 310 or E P 321) and 330.
Topics include telecommunications theory; network design methodology; protocols and standards for data transmission in computer-communication networks; architectures of local-area and long-haul networks; high-level protocols; microcomputer networks; and economics of networking.

**CMPT 429.3
Translator Writing
2(3L)**

Prerequisite(s): CMPT 360.
Context-free and regular grammars. Programming language design. Scanners. Compile-time error handling. LL(1), SLR(1), LALR(1), and LR(1) grammars with their associated syntactic analyzers. Introduction to attributed translation grammars, semantic analysis and code generation.

Note: May be offered alternate years.

**CMPT 460.3
Computer Graphics
1(3L)**

Prerequisite(s): CMPT 330 or 340, MATH 264 or 266 or E E 326 or C E 318 or permission of the department.
Introduction to computer graphics. An overview of passive and interactive graphics hardware. Emphasis is on the design and development of raster graphics. Topics include algorithms for generating lines, circles and ellipses, half toning, shading, clipping, ray-tracing and curve fitting. A course project involves implementation of some selected graphics algorithms.

**CMPT 470.3
Information Systems Development
1(3L-2S)**

Prerequisite(s): CMPT 371 and 374.
Lectures and course projects on developing information systems including life-cycle models, specifications of requirements, system design, verification and validation, testing, software metrics, and project management.

**CMPT 475.3
Information Resource Management
2(3L)**

Prerequisite: Either CMPT 370 or CMPT 275. Restricted to students enrolled in the College of Commerce.
This course focuses on the planning for and management of complex state of the art information systems. Topics include: capturing and producing information; evaluating, enhancing, and protecting the value of information; independent and interdependent information systems; and the support and management of information infrastructures.

**CMPT 481.3
Human-Computer Interaction
1(3L)**

Prerequisite(s): CMPT 370.
Fundamental theory and practice in the design, implementation, and evaluation of human-computer interfaces. Topics include: principles of design, usability engineering, methods for evaluating interfaces with or without user involvement, techniques for prototyping and implementing graphical user interfaces.

**CMPT 490.3
Ethics and Computer Science
2(3L-3S)**

Prerequisite(s): Successful completion of 30 credit units in computer science, including at least 3 credit units at the 400-level.

Addresses social, ethical, legal and managerial issues in the application of computer science to the information technology industry. Through seminars and case studies, human issues confronting computer science graduates will be addressed. Topics include managerial and personal ethics, computer security, privacy, software reliability, personal responsibility for the quality of work, intellectual property, environment and health concerns, and fairness in the workplace.

**CMPT 496.3
Markov Chains and Queuing Theory
2(3L)**

Prerequisite(s): CMPT 393.
Markov and queuing processes in maintenance, inventory and traffic problems. The analysis of queues. Transient and steady state solution.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

CMPT 398.3 1/2(3S)

CMPT 399.6 1&2(3S)

CMPT 498.3 1/2(3S)

CMPT 499.6 1&2(3S)

GRADUATE COURSES

Department of Computer Science, College of Graduate Studies & Research

**CMPT 810.3
Algorithms
1/2(3L)**

Advanced design and analysis of algorithms. Includes pattern matching in strings, augmenting algorithms on graphs (including network flows, connectivity, and matching), computational geometry (including convex hulls, Voronoi diagrams, intersection problems, and planar point location), parallel algorithms for shared memory and interconnection network models, and distributed algorithms.

**CMPT 812.3
Knowledge Representation and Reasoning
1/2(3L)**

Representation of knowledge in formal languages. Inference, logic programming, efficient automated theorem proving, search techniques. Nonmonotonic logic, diagnosis explanation and other patterns of plausible inference. Probabilistic approaches including stochastic search techniques, probabilistic nets, diagnosis, inferring structure from data, belief functions, and an overview of uncertainty formalisms.

**CMPT 813.3
Programming Language Semantics
1/2(3L)**

Introduces the principal ways in which programming languages are defined. The primary focus is on denotational semantics and the underlying domain theory; model theoretic semantics and computational proof theories may also be covered. Other topics considered include operational semantics, axiomatic semantics, algebraic specifications, and category theory.

**CMPT 814.3
Introduction to VLSI Systems Design
1/2(3L-3P)**

Emphasizes the design and related issues of VLSI-based systems, analysis of subsystems design approaches, specialized VLSI chips design, and VLSI impact on architectures. Includes MOS technology, CMOS circuits and logic design, array structures, subsystem design, system design aspects, and new trends in VLSI systems design.

**CMPT 815.3
Computer Systems and Performance Evaluation
1/2(3L)**

Provides a comprehensive overview of the quantitative aspects of computer systems with a particular focus on performance evaluation. Topics include performance measurement, the analysis and interpretation of measurement data, workload characterization and modeling, the design and evaluation of performance experiments, and the design and application of analytical techniques. A variety of application domains will be considered.

**CMPT 816.3
Software Engineering
1/2(3L)**

Concerns the major practical and theoretical concepts used in building large-scale software systems. Emphasizes current software development methodologies and tool support that accompanies the methodologies. The areas of software development that will be emphasized are: requirements definition and analysis; system design; and implementation and testing.

**CMPT 818.3
Queuing Theory and Modeling Applications
1/2(3L)**

Markov and queuing processes in maintenance, inventory and traffic problems. The analysis of queues. Transient and steady state solutions.

**CMPT 819.3
Image Processing and Computer Vision
1/2(3L)**

An introduction to image processing and computer vision, including coverage of topics such as the basics of image representation and manipulation, edge detection, image segmentation, photometric stereo and shape from shading, optical flow, and pattern recognition.

**CMPT 823.3
Compilers
1/2(3L)**

The definition and classification of formal grammars. A discussion of regular and context-free grammars with their relationships to automata. Precedence, operator precedence, LR(k) and LALR(k) grammars with their associated syntactic analyzers, symbol table techniques, intermediate forms of source programs, run-time organization, code generation and optimization. Interpreters and their relation to the compilation process. Introduces translator writing systems and compiler-compilers.

**CMPT 826.3
Data and Process Modeling
1/2(3L-2P)**

Data and process modeling applied to the storage and manipulation of large amounts of data. Topics include conceptual database design, transformations for database schema, high level logical design with the ER model and the relational model, and database design tools. Applications and problems with object-oriented, knowledge, hypermedia and multimedia databases are covered.

**CMPT 829.3
Computer Graphics
1/2(3L)**

Introduction to computer graphics. An overview of passive and interactive graphics hardware. Software systems for graphics. Design philosophy for interactive systems. Data structure for graphics. Design of raster graphics algorithms. Rendering of realistic images using ray tracing and radiosity techniques.

**CMPT 850.3
Topics in Computational Geometry
1/2(3L)**

Prerequisite(s): CMPT 810; or equivalent.

The study of geometric problems in a computational setting. May cover such topics as convex hulls, voronoi diagrams, proximity problems, linear programming, polygon decomposition, planar point location, multidimensional trees, range search, and visibility computations.

**CMPT 852.3
Topics in Formal Artificial Intelligence
1/2(3L)**

Prerequisite(s): CMPT 812; or equivalent.

The representation of knowledge in formal languages and the technical problems arising in such representations. May include the comparative study of formalisms for reasoning with uncertain information, nonmonotonic reasoning, truth maintenance, constraint satisfaction, probabilistic causal nets, and belief revision.

**CMPT 853.3
Topics in Logic Programming
1/2(3L)**

Prerequisite(s): CMPT 812 or 813; or equivalent.

An in-depth exploration into logic programming, its foundations, methods, architectures, applications, and extensions. Includes model- and proof-theoretic semantics and operational semantics. Other topics will vary according to instructor and class interest and may include: negation, implementation techniques, meta-programming, grammars, abstract interpretation, partial evaluation, constraint logic programming, extensions for parallelism, deductive databases, and amalgamating of logic programming with other declarative paradigms.

**CMPT 854.3
Topics in Hardware, Architecture and VLSI
1/2(3L)**

Prerequisite(s): CMPT 814; or equivalent.

Emphasizes VLSI methodology and impact on computer architectures. Includes parallel architectures, VLSI testability and fault-tolerant computing. Particular attention will be in the design of fault-tolerant array processors, parallel architectures, neural computing, and multiple-valued logic. Various architectural and implementation issues will be addressed.

**CMPT 855.3
Topics in Computer Networks
1/2(3L)**

Prerequisite(s): Previous course in Networks.

Includes low-level protocols (e.g., channel access protocols), routing, flow control, congestion control, transport layer protocols, protocol performance, and network measurement and workload characterization. Of particular interest are high-speed networks, B-ISDN and ATM, fast-packet switching, and gigabit networking.

**CMPT 856.3
Topics in Software and Knowledge Engineering
1/2(1.5L-1.5S-1.5P)**

Prerequisite(s): CMPT 816 or 826; or

equivalent.

Concerned with tools, methods, methodologies, and standards in the software engineering of conventional information systems, hypermedia and multimedia systems, and knowledge-based systems. Topics are to be selected from the following: requirements specification methodologies, object oriented design; process modeling; CASE environments and standards; software testing, validation, metrics and quality assurance; reverse engineering; shells for knowledge-based systems; second generation expert systems; knowledge acquisition; and human-computer interfaces.

**CMPT 857.3 Bioinformatics and Computational Biology
1/2(3L-1.5P)**

Prerequisite: Open to students in computer science, life sciences, and natural sciences, but subject to permission of the instructors.

An applications-based approach to major concepts and techniques in bioinformatics; characterization of bioinformatics and computational biology; application of various computer science concepts and techniques from areas such as artificial intelligence, databases, computational linguistics, simulation, networks; collaborative work in multi-disciplinary teams.

**CMPT 858.3
Topics in Modeling and Operations Research
1/2(3L)**

Prerequisite(s): CMPT 818; or equivalent.

In-depth coverage of recent research areas from Operations Research, and applications to system modeling. Advanced topics from mathematical programming, queuing theory, inventory control, simulation, Markov modeling, and simulation.

**CMPT 859.3
Topics in Computer Vision
1/2(3L)**

Prerequisite(s): CMPT 819; or equivalent.

Advanced topics in Computer Vision. Topics may be selected from the areas of image segmentation, shape-from-shading, stereo vision, shape representation and recognition, image tracking, and active vision.

**CMPT 860.3
Topics in Algorithms
1/2(3L)**

Prerequisite(s): CMPT 810; or equivalent.

Advanced topics in algorithms. Areas covered may include parallel algorithms, distributed algorithms, on-line algorithms, graph algorithms (e.g., algorithms for special classes of graphs), advanced geometric algorithms, new algorithmic techniques, new algorithmic directions, complexity analysis, and computationally hard problems.

**CMPT 862.3
Topics in Applied Artificial Intelligence
1/2(3L)**

Prerequisite(s): CMPT 812; or equivalent.

Topics in artificial intelligence focusing on intelligent systems and software. Topics will be selected from areas such as expert systems, intelligent tutoring systems, knowledge acquisition, machine learning,

planning, natural language processing, qualitative reasoning, neural networks, and cognitive science.

**CMPT 863.3
Topics in Functional Programming
1/2(3L)**

Prerequisite(s): CMPT 813; or equivalent.
Functional programming languages permit a wide variety of semantic definitions and a wide variety of implementation approaches. Explores selected topics in the semantics and/or implementation of these languages. May include: algebraic semantics, type theory, polymorphic type deduction, inheritance, graph reduction, data flow, systolic/wavefront arrays, and a variety of semantically sound optimization techniques.

**CMPT 865.3
Topics in Parallel and Distributed
Systems
1/2(3L)**

Prerequisite(s): Previous course in operating systems; CMPT 815; or equivalent.
Concerns selected design issues in distributed and parallel computer systems, particularly those most relevant to the goal of achieving high performance. In the parallel systems areas, such design issues arise in operating systems, run-time support software, compilers, and architecture. Topics concerning distributed systems may include interprocess communications, file systems, and load sharing, with emphasis on support for advanced parallel or multimedia applications.

**CMPT 866.3
Topics in Human-Computer
Interaction
1/2(3L)**

Prerequisite(s): CMPT 816 or 826; or equivalent.
Topics studied may include the analysis and design of human-computer interaction, user interface objects and tool kits, intelligent user interfaces and user modeling, adaptive system design, human-computer interaction standards, and computers in society.

**CMPT 880.3
Research Methods and Topics I
1&2(1.5L)**

Prerequisite(s): Admission to the M.Sc. program in computer science.
An introduction to research methods and research topics in computer science. Selected topics are researched under the direct supervision of faculty members, and reports on the outcome of this research are given in both oral presentations and in written papers. Required of all students in the M.Sc. program.

**CMPT 890.3
Research Methods and Topics II
1&2(1.5L)**

Prerequisite(s): Admission to the Ph.D. program in computer science.
A follow-up to CMPT 880 and is required of all Ph.D. students in Computer Science. The student focuses on two selected research areas, one oriented towards experimental aspects of computer science

and the other towards theoretical aspects. Presentation of results of project work is given both orally and as written papers.

**CMPT 898.3
Special Topics**

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

**CMPT 990
Seminar**

All graduate students are required to register and regularly attend and participate in the department seminar series throughout their period of residence. Ph.D. students are required to present a seminar based on their own research.

**CMPT 994
Research**

Students writing a Master's thesis must register for this course.

**CMPT 996
Research**

Students writing a Ph.D. thesis must register for this course.

CREE

Department of Native Studies, College of Arts & Science

**CREE 101.6
Introductory Cree
1&2(3L-3P)**

Presents the elements of the grammar and vocabulary of Cree as spoken in central Canada and will introduce the oral literary tradition associated with it. Its objective will be to develop elementary competence in the language and a basic acquaintance with Cree culture and traditions.

**CREE 120.6
Intermediate Cree
1&2(3L-3P)**

Prerequisite(s): CREE 101.
Continues the study of the Y dialect of Cree at the intermediate level, with increased emphasis on Cree literary traditions. The structure of transitive verbs, noun inflections, various interrogative forms, imperatives, subjunctives and complex syntactic forms will be treated. Textual material will be analyzed and discussed.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

- CREE 398.3 1/2(3S)
- CREE 399.6 1&2(3S)
- CREE 498.3 1/2(3S)
- CREE 499.6 1&2(3S)

DENTISTRY

College of Dentistry

FOUR YEAR D.M.D. PROGRAM

**DENT 210.1
Application of Dental Research to
Clinical Decision Making
2(1L)**

This course provides students with knowledge of how to access, understand and critically evaluate dental scientific literature. The course will consist of lectures and laboratory sessions. In the laboratory sessions, students will perform computer generated literature searches in the Health Science Computer Lab.

**DENT 288.2
Infection Control in Dentistry
2(2L)**

Successful prevention of disease spread and proper maintenance of clinic safety require the knowledge of infection control. Dental students must play key roles in the maintenance of the well being of patients and in the organization of safe dental clinics. These responsibilities require an understanding of procedures used for infection control. The objective of the course is to provide a basic concept of infection control in the form of didactic lectures and clinical practice.

**DENT 410.2
Application of Dental Research to
Clinical Decision Making
1&2(1L)**

The concepts learned in DENT 210 will be extended by reviewing basic statistical issues. Students will conduct a laboratory and/or clinical study to be presented as a table clinic. Findings from the literature review and the experiment will be presented in class and at "Table Clinic Night". This course will consist of lectures and seminars.

**DENT 440.2
Dental Practice Management
1&2(1L)**

This course will introduce the concepts of practice management to the dental student. The first term deals with the Dental Profession Act and the regulations under the Act, the Dental Code of Ethics, and Dentistry and the law. The second term provides an introduction to the business and legal aspects of dental practice.

**DENT 540.2
Dental Practice Management
1&2(1L)**

This course continues with the concepts, theory and practical approaches to dental practice management that began in DENT 440. The student will already have begun to apply this knowledge.

**DENT 580.2
General Dentistry Clinic
TBA**

The clinic sessions will allow students to treat patients in an environment that more closely approximates a general dental practice situation.

**DENT 585.4
Comprehensive Care Senior Clinics
TBA**

The Comprehensive Care Senior Clinics will allow patient care to be provided in a comprehensive manner. Procedures from multiple disciplines will be able to be done at the same appointment, if deemed appropriate at the time.

**DENT 590.4
Option Program**

The option program encourages students to explore areas of personal interest in dentistry. Students select a program consisting of one or more options in any clinical, teaching, or research area subject to approval by the Undergraduate Education Committee. Locations range from the University of Saskatchewan to areas in foreign countries. Students are required to submit written reports about their activities during the option period. Supervisors at each locale provide written evaluations. Satisfactory performance in this program is necessary for students to be considered eligible for graduation.

FIVE YEAR D.M.D. PROGRAM

**DENT 610.16
Option Program**

The option program encourages students to explore areas of personal interest in dentistry. Students select a program consisting of one or more options in any clinical, teaching, or research area subject to the Undergraduate Education Committee's approval. Locations range from the University of Saskatchewan to areas in foreign countries. Students are required to submit written reports about their activities during the option period. Supervisors at each locale provide written evaluations. Satisfactory performance in this program is necessary for the student to be considered eligible for graduation.

DRAMA

Department of Drama, College of Arts & Science

As of 1 September 2001, students in their second, third, or fourth year of the Drama program have the option of completing either the new program or the program as it existed prior to September 2001. All Drama majors beginning their first year in September 2001 or later will be required to follow the new program with its specific sequencing of courses. Students should also be aware that there are equivalencies between old and new courses and that students with credit for a course under the old curriculum may not take for credit the new curriculum equivalency. The course equivalencies are as follows:

Old	New
100.6	101.3
104.6	104.6
110.3	110.3
113.3	113.3
116.3	116.3
117.3	117.3

121.3	121.3
201.6	203.3 & 303.3
202.6	204.3 & 304.3
210.3	210.3
213.3	213.3
216.3	216.3
217.3	217.3
220.3	220.3
221.3	221.3
302.6	209.3 and 3 c.u. from selected Classics, English, French
314.6	320.3 & 321.3
315.6	316.3 & 317.3
326.3	3 c.u. of Drama electives or 234.2 and 235.2
327.3	330.3
331.6	331.6
341.6	341.6
401.3	401.3
402.3	402.3
415.6	416.3 & 417.3
414.6	420.3 & 421.3
481.6	481.6

DRAMA 101.3
How to Read Drama
1/2(3L)

An introductory course in the reading, and analysis, of playscripts. The course will offer a brief survey of script analysis techniques (used by directors, actors, and other theatre personnel) as applied to major plays from various genres and historical contexts.

DRAMA 104.6
Introduction to Theatre
1&2(3P)

Direct experience of theatre arts and crafts. Designed to encourage the individual's creative impulse. Dramatic activities, for teachers at all levels, are explored and students move towards an understanding of drama as education.

Note: This course is not acceptable in a major in drama in the College of Arts and Science except with written permission of the Head of the Drama Department.

DRAMA 110.3
Technical Theatre: Scenic Construction
1/2(1.5L-3P)

Introduces the fundamentals of scenic construction techniques including construction methods and materials, scene painting and aesthetic aspects of producing scenery for the stage. Requires a minimum of 25 hours production work beyond the regular class and lab hours. Students should avoid taking any evening classes because of the demands of evening production set-up and rehearsals.

DRAMA 113.3
Technical Theatre: Stage Properties
1/2(1.5-3P)

Introduction to the fundamentals of stage properties construction, materials and techniques. Emphasis will be placed on the practical and aesthetic aspects of producing stage properties for theatre productions.

There is a requirement of a minimum of 25 hours production work beyond the regular class and lab hours. Students should avoid taking any evening classes because of the demands of evening production set-up and rehearsals.

DRAMA 116.3
Acting 1
1/2(1L-2P)

The essentials of acting through the exploration of body, voice, idea, and imagination.

DRAMA 117.3
Acting 2
1/2(1L-2P)

Prerequisite(s): DRAMA 116.

Fundamentals introduced in Acting 1 will be applied to the process of interpreting the dramatic text.

DRAMA 121.3
Directing for the Non-Specialist S & S(1L-2P)

A practical and theoretical course for those interested in directing plays for amateur bodies such as schools and community groups. The directing process will be explored in terms of script analysis, script scoring, audition methods, coaching techniques, the development of rehearsal schedules, and the design of floor plans and blocking.

Note: Normally offered only in Spring and Summer Session. Students are encouraged to contact the department prior to registration in the course. Open to drama majors as an elective only under Requirement 7 of Program Type D. Students with credit for another 100-level drama course may not take this course for credit.

DRAMA 203.3
History of Theatre from 600 B.C. to 1850
1/2(3L)

Prerequisite: Completion of 30 credit units at the university.

History of theatre, dominantly in the Western tradition, from antiquity through to the Romantic revolt and the beginnings of realism. The evolution of theatrical production (acting, production, theatre architecture) will be emphasized, with assigned plays being examined largely within the context of the production and performance dynamics of their period.

DRAMA 204.3
History of Theatre from 1850 to the Present
1/2(3L)

Prerequisite(s): Completion of 30 credit units at the university.

History of theatre, dominantly in the Western tradition, from the rise of the modern theatre to the present day. Evolution of theatrical production (acting, directing, production, theatre architecture) will be emphasized, with assigned plays being examined largely within the context of the production and performance dynamics of their period.

DRAMA 209.3
Theories of Acting/Directing
1/2(3L)

Prerequisite(s): Completion of 30 credit

units at the university.

Acting and directing theory from the Enlightenment to the present day. Emphasis will be placed on the evolving role of the director and actor, as conceived of by important theoretician/practitioners, and on the influence of accelerating technology and changing trends in social, political, psychological and cultural thought.

DRAMA 210.3
Technical Theatre: Costume Construction
1/2(3L-3P)

Prerequisite(s): DRAMA 110 or 113 and permission of the department.

A study of the craft and art of the theatre costumer. Emphasizes the practical and aesthetic aspects of producing costumes for the stage. There is a requirement of 50 hours production work beyond the regular class and lab hours. Students should avoid taking any evening classes because of the demands of evening production set-up and rehearsals.

DRAMA 213.3
Technical Theatre: Stage Management
1/2(3L-3P)

Prerequisite(s): DRAMA 110 or 113 and permission of the department.

Introduction to the fundamentals of the craft and art of stage lighting, sound production, and theatre stage management. There is a requirement of a minimum of 50 hours production work beyond the regular class and lab hours. Students should avoid taking any evening classes because of the demands of evening production set-up and rehearsals.

DRAMA 216.3
Acting 3
1/2(1L-3P)

Prerequisite: DRAMA 117.

The exploration of character in acting.

DRAMA 217.3
Acting 4
1/2(1L-3P)

Prerequisite: DRAMA 216.

Exploration of character development as affected by the creative relationship between actors in rehearsal and performance.

DRAMA 220.3
Introduction to Theatre Design 1
1/2(2L-4P)

Prerequisite(s): DRAMA 110, 113 and permission of the department.

Introduction to the technical and aesthetic skills and methods required of the theatre designer. Special consideration will be given to the development of skills required to communicate with fellow theatre practitioners, directors, designers and technicians in the visual medium.

DRAMA 221.3
Introduction to Theatre Design 2
1/2(2L-4P)

Prerequisite(s): DRAMA 220, and permission of the department.

An exploration of the role of the theatre designer in the areas of setting, costumes and lighting. Special consideration will be given to the development of skills required to communicate with fellow theatre

practitioners, directors, designers and technicians in the visual medium. An application of the technical skills learned in DRAMA 220.

DRAMA 234.2
Basic Theatre Voice and Speech
1/2(1P)

Prerequisite(s): DRAMA 116 and DRAMA 117.

Development of the student's physical awareness of the vocal process through exercises in relaxation, body alignment, support of tone and resonance. The voice as a communicative instrument and the beginning of its technical control through the speaking of prose and poetry. Emphasis on freeing the vocal apparatus of tension.

DRAMA 235.2
Basic Movement
1/2(1L)

Prerequisite(s): DRAMA 117.

An introduction to the various areas of movement training upon which a performer's physical skills are founded.

DRAMA 236.3
Stage Combat
1/2(3P)

Prerequisite: DRAMA 116.

The principles and techniques used to successfully achieve the illusion of physical violence for the stage. Actor safety, effective blocking, believable energy transfer and the analysis of physical motion during conflict will be examined.

DRAMA 303.3
Advanced Studies in Theatre History
1
1/2(3L)

Prerequisite: DRAMA 203.3 or permission of the Department.

Intended for students who have acquired some background in the theatre from 600 B.C. to 1850. The course will involve more intensive study of the aesthetic, literary and production/performance aspects of the theatre of the past, integrating theoretical and practical approaches to the material.

DRAMA 304.3
Advanced Studies in Theatre History
2
1/2(3L)

Prerequisite: DRAMA 204.3 or 209.3 or the permission of the Department.

Intended for students who have acquired some background in the theatre from 1850 to the present. The course will involve a more intensive study of the aesthetic, literary and production/performance aspects of the theatre of the contemporary period, integrating theoretical and practical approaches to the material.

DRAMA 316.3
Acting 5
1/2(6P)

Prerequisite(s): DRAMA 217.

An advanced course in the art of Shakespearean acting focussing on the demands Shakespeare's texts make upon the actor's intellect, emotions, voice, and movement.

DRAMA 317.3

**Acting 6
1/2(6P)**

Prerequisite(s): DRAMA 316.

A course in acting styles other than Shakespeare. Scene study and exercises in various periods and genres, which may include Greek theatre, medieval theatre, Comedy of Manners, farce, absurdist and Epic theatre.

DRAMA 320.3

**Intermediate Theatre Design 1
1/2(2L-4P)**

Prerequisite(s): DRAMA 221.3, Introduction to Theatre Design 2.

Further development of the Theatre Designer in the areas of Costume, Lighting and Set Design. Continued exploration of design aesthetics in theoretical design projects. Focus is on individual "paper projects" involving the complete planning and execution of projects in costume, sets and lighting.

DRAMA 321.3

**Intermediate Theatre Design 2
1/2(2L-4P)**

Prerequisite(s): DRAMA 320.3, Intermediate Theatre Design 1.

Continued exploration and identification of concepts and methods as they relate to Costume, Set and Lighting design. Focus on continued exploration of the theatre design process and the continued improvement of technical and aesthetic skills. Course may involve a design project that relates to departmental productions.

**DRAMA 322.3, 323.3, 422.3, 423.3
Studies in Technical Theatre 1, 2, 3,
and 4
1/2(4P-2T)**

Prerequisite(s): DRAMA 220.3 is a prerequisite to 322.3; completion of 60 credit units at the university; and permission of the department.

Subsequently each number level is prerequisite to the next level

For the student who wishes to pursue advanced studies in technical theatre practices in such areas as Stage Management, Lighting and Sound, Theatre Properties and Effects. Studies will be closely related to the department's schedule of productions.

DRAMA 330.3

**Physical Theatre 1: Clown
1/2(6P)**

Prerequisite(s): DRAMA 235.

Neutral Mask and Clown: studies in physical theatre, Part one will consist of the student's discovery of neutral expression and expressiveness through the use of neutral mask. Part two will allow the student to develop the personal clown.

DRAMA 331.6

**Playwriting
1&2(3S)**

Prerequisite(s): At least 12 credit units in Drama and 12 credit units in English.

The craft of writing plays, explored through exercises and class discussions.

DRAMA 334.2

**Intermediate Theatre Voice and
Speech
1/2(1P)**

Prerequisite(s): DRAMA 234.2, Basic Theatre Voice and Speech.

Further development of the actor's voice in range, power, and flexibility. Exercises to reinforce basic skills, to heighten resonance, to increase pitch range, and to develop greater facility in articulation. Increased responsiveness to language values.

DRAMA 335.2

**Intermediate Movement
1/2(1P)**

Prerequisite(s): DRAMA 235.

Building on the skills introduced in Drama 235.2, the students will deepen their understanding of daily physical discipline and will continue to observe and recreate human behaviour.

DRAMA 341.6

**Play Directing
1&2(6P)**

Prerequisite(s): DRAMA 110, 113; 216 and 217 (both may be taken concurrently).

Basic problems in directing and producing plays.

DRAMA 401.3

**Dramatic Theory and Criticism
1/2(3L)**

Prerequisite(s): At least 12 credit units in English.

An examination of significant theories of major critics, theorists and writers of the theatre from ancient to modern.

DRAMA 402.3

**Studies in Canadian Theatre
1/2(3L)**

Prerequisite(s): At least 12 credit units in English.

An examination of dominant trends in Canadian theatre practice.

DRAMA 416.3

**Acting 7
1/2(6P)**

Prerequisite(s): DRAMA 317.

A studio production for 4th year actors. The student will be encouraged to enhance strengths and correct weaknesses in technical delivery. The course will focus on the concept of the ensemble as well as rehearsal and performance strategies.

DRAMA 417.3

**Acting 8
1/2(6P)**

Prerequisite(s): DRAMA 416.

A course in acting for film, television, and radio, with special concentration on the technical demands of acting for the media.

DRAMA 420.3

**Advanced Theatre Design 1
1/2(2L-4P)**

Prerequisite(s): Drama 321.3, Intermediate Design 2.

An advanced study of set, costume and lighting design. Emphasis will be placed on the student's growing independence as a practicing theatre designer.

DRAMA 421.3

**Advanced Theatre Design 2
1/2(2L-4P)**

Prerequisite(s): Drama 420.3, Advanced Theatre Design 1.

An advanced study of set, costume and lighting design as it relates to practical application. The student will be assigned a design project that relates to departmental productions.

DRAMA 430.3

**Physical Theatre 2: Commedia
1/2(6P)**

Prerequisite(s): DRAMA 235.

The Commedia dell'arte. A study of the Commedia dell'arte masks or "types", physical acting, comedy, lazzi and concetti.

DRAMA 434.2

**Advanced Theatre Voice and Speech
1/2(1P)**

Prerequisite(s): DRAMA 334.2, Intermediate Theatre Voice and Speech.

Consolidation of vocal technique developed in DRAMA 234.2 and DRAMA 334.2.

Specialized problems for the vocal professional will be addressed: dialects and characterization as they relate to voice and speech; cold readings; assessing vocal demands and preparing for them; coaching in support of performance in productions.

DRAMA 435.2

**Advanced Movement Studies
1/2(1P)**

Prerequisite(s): DRAMA 335.

This course will consolidate the training given in Drama 335.2, expanding on the students' shared learning and developing various configurations of performers - trios, quartets, and choral groupings.

DRAMA 481.6

**Advanced Reading and Special
Studies
1&2(6P/3S)**

Restricted to students who wish to pursue further planned study in a phase of drama of their choice with approval of the Head of the Department.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

DRAMA 298.3 1/2(3S)

DRAMA 299.6 1&2(3S)

DRAMA 398.3 1/2(3S)

DRAMA 399.6 1&2(3S)

DRAMA 498.3 1/2(3S)

DRAMA 499.6 1&2(3S)

GRADUATE COURSES

Department of Drama, College of Graduate Studies & Research

DRAMA 990

Seminar

ECONOMICS

Department of Economics, College of Arts & Science

ECON 111.3

**Price Theory and Resource Allocation
1/2(3L)**

Shows the student how to understand the individual consumption and production decisions which are made within a market economy, guided by prices and costs. Economic concepts of supply, demand, cost, response to price changes, production, equilibrium, and income distribution are analyzed.

ECON 114.3

**Money and Income
2(3L)**

Prerequisite(s): ECON 111 recommended.

Shows the student how to understand the collective problems in economic policy, and the choices which face a modern economy. Social accounting, national income, consumption, saving, government spending, taxation, investment, interest rates, money and banking, foreign trade, and balance of payments are analyzed.

ECON 204.6

**Statistical Applications in the Social
Sciences
1&2(3L-1P)**

Prerequisite(s): ECON 111.

An introduction to statistical methods and their application to problems in economics and related disciplines.

Note: Students are not permitted to take both this course and STATS 103, 244, 245, 246, SOC 240, PSY 233 or 234, or QUANT 194 or 295 (or their equivalents) for credit.

Note: Students who have taken other courses in statistics, either from Arts and Science or from another college, should consult "Regulations for Introductory Courses in Statistics" for information on statistics course equivalencies. See "Statistics Courses" in the Index section of the Calendar.

ECON 211.3

**Intermediate Microeconomic Theory
1/2(3L)**

Prerequisite(s): ECON 111.

Presents the student with a formal analysis of demand, elasticity, cost, production, firm and market equilibrium, competition, monopoly, oligopoly, factor demand and prices, general market equilibrium, and welfare.

Note: Students with credit for ECON 213 may not take this course for credit.

ECON 213.3

**Applied Microeconomics
1/2(3L)**

Prerequisite(s): ECON 111.

Presents the student with an understanding of consumer and producer behaviour in the market place. Emphasis will be on applied problems and case studies.

Note: Students with credit for ECON 211 may not take this course for credit.

**ECON 214.3
Intermediate Macroeconomic Theory
1/2(3L)**

Prerequisite(s): ECON 111, 114, and 211 or 213.

Presents the student with a formal analysis of national accounting, the consumption function, investment, public expenditure, taxes, budgets, money and interest, IS-LM analysis of general equilibrium in an open economy, aggregate supply and demand, public policy, inflation, and the rudiments of growth theory.

**ECON 221.3
Women and the Economy
1/2(3L)**

Prerequisite(s): ECON 111.

An examination of women's changing economic roles. Includes an analysis of labour force participation, wage inequality, gender differences in education, intra-household distribution of resources, economics of reproduction, and how technological change affects women.

**ECON 223.3
Labour Economics
1(3L)**

Prerequisite(s): ECON 111 and 114.

An economic analysis of the labour market. Topics discussed will include the allocation of the labour force among sectors, industries and occupations and the functions and nature of the labour market. The problem of unemployment and public policy will be considered.

**ECON 227.3
Wage Determination
2(3L)**

Prerequisite(s): ECON 111 and 114.

A study of the theories of wage determination in various institutional settings. Analysis of the general level of wages and employment will also be considered. Emphasis will be on theoretical models.

**ECON 231.3
Co-operatives
1/2(3L)**

Prerequisite(s): ECON 111.

The historical background, philosophy and development of co-operatives are studied with special reference to the experience and problems of the prairie economy. Economic problems peculiar to co-operative organization are analyzed.

**ECON 234.3
Economics of Health Care
1/2(3L)**

Prerequisite(s): ECON 111.

An application of economic analysis to selected aspects of the health care delivery system. Emphasis will be placed upon an evaluation of the applicability of consumption and production theory to the delivery of physicians' services. Empirical work on the demand for and supply of physicians' services will be reviewed with particular reference to its significance for public policy.

**ECON 254.3
The International Trading System
1(3L)**

Prerequisite(s): ECON 111.

A survey of the development of the international trading system with particular

attention to its evolution in the post-World War II period.

**ECON 256.3
The International Monetary System
1/2(3L)**

Prerequisite(s): ECON 114.

A survey of the development of the international monetary system with particular attention to its evolution in the post-World War II period.

**ECON 261.3
Economic History of Europe and the British Isles from the Economics of the Roman Empire to the Economics of European Expansion
1/2(3L)**

Prerequisite: ECON 111 and 114.

This is an analytically oriented survey of the economic development and growth of the European economy in the context of the world economy, beginning with a brief survey of the pre-historic economies. This course ends with an analysis of the economics of colonization and the expansion of international trade and how these impacted differentially on the economies of Western Europe.

**ECON 263.3
The Economic History of Europe and the British Isles: Economic Development from an Historical Perspective and the Rise of Western Economies
1/2(3L)**

Prerequisite: ECON 111 and 114.

An analytically-oriented survey of the economic development and growth of the European economy in the context of the world economy, beginning with a comparative analysis of the economies of Europe in the 16th Century. This is followed by a discussion of the details of Britain's Industrial Revolution, the lessons to be learned from this experience and how it affected the rest of the world.

**ECON 265.3
The Economic History of Canada from the Pre-Contact Era to the 18th Century
1/2(3L)**

Prerequisite: ECON 111 and 114.

Economic analysis of Canadian history from the pre-European era to the 18th century. The course focuses on the causes of differential economic development which occurred in Canada and how this discussion might improve our understanding of the process of economic development.

**ECON 267.3
The Economic History of Canada from the Early 19th Century to the Great Depression
1/2(3L)**

Prerequisite: ECON 111 and 114.

Economic analysis of the history of Atlantic colonies as well as of Quebec and Ontario, and the Western lands still controlled by the Hudson's Bay Company. Concludes with an analytical discussion of the process of Canadian economic development in the 19th and 20th Centuries in the context of the international economy.

**ECON 270.3
Economic Development in Non-Industrialized Countries
1(3L)**

Prerequisite(s): ECON 111 and 114.

A review of the economic development of selected countries. The relevance of resources, financial institutions, government action and regional differences to problems of industrialization in these countries will be studied in the light of past and current theories of economic development.

**ECON 275.3
The Economics of Natural Resources
1(3L)**

Prerequisite(s): ECON 111 and 114.

The application of economic analysis to issues concerning the use of natural resources, their management and conservation, as well as environmental effects following therefrom. Policy problems related to the ownership of natural resources, their management, and taxation will also be discussed.

**ECON 277.3
The Economics of the Environment
1/2(3L)**

Prerequisite(s): ECON 111 and 114.

An introduction to the economic analysis of environmental issues. It will include analysis of environmental quality, benefit-cost analysis, and evaluation of different environmental policies and their application in Canada and Saskatchewan. It will conclude with analysis of global environmental issues.

**ECON 280.3
Classical Economics
1(3L)**

Prerequisite: ECON 111 and 114.

The history of classical economics: Adam Smith, David Ricardo and Karl Marx, among others, with emphasis on the theories of value, distribution, growth, population, money and trade.

**ECON 285.3
The Economics of Central American Development
2(2.5L-1.5S)**

Prerequisite(s): ECON 111 and 114.

Part of the La Antigua, Guatemala Study Term Abroad. Examines selected aspects of the theory of development and its experience in Central America, with a particular emphasis on Guatemala. Through lectures and discussions, students will look at trade, technology, infrastructural investment, industrialization, agricultural efficiency and other issues.

ADVANCED COURSES

300- and 400-level courses are advanced courses in economics. A junior course in calculus and ECON 111 are prerequisites for all 300- and 400-level courses. Additional prerequisites for specific courses are noted in the course description.

**ECON 305.3
Quantitative Methods in Economics I
1(3L-3P)**

Prerequisite(s): ECON 114.

An introduction to the application of

quantitative methods in Economics.

Note: Students with credit for a course in linear algebra may not take this course for credit.

**ECON 306.3
Quantitative Methods in Economics II
2(3L-3P)**

Prerequisite(s): ECON 114 and ECON 305.3 or a course in Linear Algebra.

An introduction to comparative statistics and optimization methods in Economics.

Note: Students with credit for ECON 304 or a course in the calculus of multiple variables may not take this course for credit.

**ECON 307.3
Economic Forecasting
2(3L)**

Prerequisite(s): ECON 214 and a course in statistics taken previously or concurrently.

Presents forecasting techniques for the economic variables necessary for planning by business, government and NGOs. The course includes choosing forecasting techniques. The course discusses both how to prepare a forecast and how to attack or defend a forecast.

**ECON 311.3
Money, Banking and Capital Markets
1(3L)**

Prerequisite(s): ECON 214.

A study of the evolution and kinds of money, its functions and its economic significance. Topics discussed include theories of the demand for money, the money supply process with particular emphasis on the role of chartered banks, central banking, and financial intermediation. The concepts developed in this analytical survey are then utilized to evaluate recent Canadian monetary policy.

**ECON 316.3
Portfolio Theory and Investment Analysis (Formerly 216)
1(3L)**

Prerequisite(s): ECON 114, 204 or an equivalent course in statistics, and 211 or 213.

Concerned with the theory of asset choice under conditions of risk and uncertainty. It considers various models of portfolio analysis, and capital market equilibrium.

**ECON 327.3
The Economics of Pay Inequality
2(3L)**

Prerequisite(s): ECON 211 or 213.

Addresses the causes and extent of pay inequality with special emphasis on pay differentials between men and women. The theoretical and empirical material available on pay inequality from the perspective of economics will be studied.

**ECON 343.3
Industrial Organization
1(3L)**

Prerequisite(s): ECON 211 or 213.

Extends the use of basic price theory to the study of market structure, conduct, and performance results. The major structural characteristics of industries in Canada, and their market conduct and performance in relation to general standards of economic welfare will also be discussed.

**ECON 344.3
Industrial Regulation
2(3L)**

Prerequisite(s): ECON 211 or 213.
An analysis of the rationale and the public policies designed to affect the market conduct and performance of firms in Canada. Includes an analysis of competition policies, economic regulations, crown corporations, and controls over multinational firms in Canada.

**ECON 347.3
Industrial Location and Regional
Economic Analysis
1(3L)**

Prerequisite(s): ECON 204 and 214.
Considers Canada's spatial structure and regional characteristics, how a region adjusts to external shocks, its growth mechanisms, and the effects of interregional trade barriers.

Note: Students with credit for ECON 346 may not take this course for credit.

**ECON 348.3
Urban Economics
2(3L)**

Prerequisite(s): ECON 211 or 213.
A consideration of those factors which systematically influence the development and growth of cities, their spatial structure, the markets for selected public services, and some special problems of urban public finance. Selected reference is made to empirical studies of Canadian cities.

**ECON 349.3
Regional Economic Models and
Methods
2(3L)**

Prerequisite(s): ECON 214.
Using the Arts Computer Lab examines a series of currently-used regional economic models and the practical applications of these models to data sets from various sorts of regions, both Industry-based and resource-based.

**ECON 350.3
Economics of Public Expenditures
1/2(3L)**

Prerequisite(s): ECON 211 or 213.
A survey of the principles of resource allocation in the public sector in relation to the role and effect of expenditure policies on the achievement of the major economic objectives. Topics include public choice, cost-benefit analysis and major expenditure programs.

**ECON 352.3
Economics of Taxation
1/2(3L)**

Prerequisite(s): ECON 211 or 213.
A survey of the principles of resource allocation in the public sector in relation to the role and effect of taxation policies on the achievement of the major economic objectives. Topics include the major taxes, fiscal federalism, and growth and the debt.

**ECON 354.3
International Trade and Commercial
Policy
1(3L)**

Prerequisite(s): ECON 211 or 213.
A survey of the theory and practice of international trade and commercial policy. Topics include theories of the determinants

of trade, the effects of customs unions, imperfect competition and growth on trading patterns and welfare, and the theory of trade policies.

**ECON 356.3
International Monetary Economics
2(3L)**

Prerequisite(s): ECON 214.
A survey of the theory and practice of the international monetary system. Topics examined include the determination of exchange rates, the international movements of capital, the conditions for balance of payments equilibrium, the process adjustment to disequilibria, and policy options in open economics.

**ECON 380.3
The History of Economic Thought
after 1870
2(3L)**

Prerequisite: ECON 214.
The marginal utility theory, marginal productivity theory, neoclassical monetary theory and Keynesian economics; Menger, Jevons, Walras, Wicksteed, Marshall, Wicksell and Keynes, among others.

**ECON 388.3
Selected Topics in Economics
1/2(3L)**

Prerequisite(s): ECON 214 and permission of the department.
Theoretical, empirical, and policy topics in microeconomics, macroeconomics, econometrics, or economics history/economic thought. Selected topics are those which are not dealt with or are covered only at an elementary level in other courses.

**ECON 389.3
Research Project in Economics
1/2(3S)**

Prerequisite(s): ECON 214 and permission of the department.
Research work on theoretical, empirical, and policy topics in microeconomics, macroeconomics, econometrics, or economics history/economic thought, under the supervision of members of the department.

**ECON 404.6
Econometrics
1&2(3L-1P)**

Prerequisite(s): ECON 204, 214 and 305.
An introduction to the application of econometric methods to the examination of economic problems. The necessary techniques will be examined in both their theoretical and empirical aspects.
Note: Students may not take both ECON 404 and STATS 344 for credit. Students with credit for ECON 404 may count this course for half credit toward a Statistics major.

**ECON 410.3
Monetary and Fiscal Policy
1(3L)**

Prerequisite(s): ECON 214.
Considers the performance, effectiveness and limitation of the tools of macroeconomic policy.

**ECON 411.3
Monetary Theory
2(3L)**

Prerequisite(s): ECON 214.
An examination of recent developments in the field of monetary theory. Topics include market-clearing and non-market-clearing models of business cycle fluctuations, rational expectations, the policy ineffectiveness debate, and the time inconsistency of optimal policy.

**ECON 412.3
Welfare Economics and General
Equilibrium
2(3L)**

Prerequisite(s): ECON 114 and 211 or 213.
Basic principles of constructing general equilibrium models and systematic review of the principles of welfare theory.

**ECON 414.3
Economic Growth
2(3L)**

Prerequisite(s): ECON 214.
Looks at the fundamental principles and economic truths common to all countries which have set for themselves the objective of growth and development. This includes the economic obstacles to development and the economic means by which developing countries can raise their rates of growth of output and living standards.

**ECON 417.3
Development Economics
3L**

Prerequisite: ECON 214.
Studies theories of economic development. Topics include human resources, financial institutions, sectoral composition, international trade, and income distribution.

**ECON 450.3
Strategic Choice
1(3L)**

Prerequisite(s): ECON 214.
A study of game theory - the analysis of choice in situations involving strategy, in which optimal behaviour depends explicitly on the behaviour of others. Covers the theories of bargaining games, both cooperative and non-cooperative games, both zero-sum and non-zero-sum games, and the analysis of uncertainty.

**ECON 470.3
Economics of Behaviour and
Behavioural Economics
1/2(3L)**

Prerequisite: ECON 214.
The economics of behaviour and the importance of behavioural assumptions for the analytical predictions of economic theory. The economics of behaviour also has significant implications for public and private economic policy and decision making, which will be discussed in some detail in this course in the context of an analysis of the overlapping and competing theoretical frameworks for human agency used by economists.

**ECON 473.3
Mathematical Introduction to Micro-
Theory
1(3L)**

Prerequisite(s): ECON 114 and 211 or 213.
Introduction to theories of consumer demand and of cost and production by

means of the calculus and linear algebra. The necessary mathematical tools will be taught in the course. Recommended for potential honours and graduate students.

**ECON 474.3
Mathematical Micro-Theory
2(3L)**

Prerequisite(s): ECON 473.
Some modern theories of consumer demand to be followed by linear models of the firm: revealed preference, demand under risk and uncertainty, characteristics theory of demand, input/output analysis and linear programming. This course is an extension of ECON 473.

**ECON 488.3
Selected Topics in Economics
1/2(3L)**

Prerequisite(s): ECON 214 and permission of the department.
Theoretical, empirical questions, or policy topics in microeconomics, macroeconomics, econometrics, or economic history/economic thought. Selected topics are those which are not dealt with or are covered only at an elementary level in other courses.

**ECON 489.3
Research Project in Economics
1/2(3S)**

Prerequisite(s): ECON 214 and permission of the department.
Research work on theoretical, empirical, and policy topics in microeconomics, macroeconomics, econometrics, or economics history/economic thought, under the supervision of members of the department.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

- ECON 298.3 1/2(3S)
- ECON 299.3 1&2(3S)
- ECON 398.3 1/2(3S)
- ECON 399.6 1&2(3S)
- ECON 498.3 1/2(3S)
- ECON 499.6 1&2(3S)

GRADUATE COURSES

Department of Economics, College of Graduate Studies & Research

**ECON 800.3
Microeconomic Theory
1(3L)**

Studies theories of exchange, consumer demand, production and cost, and pricing.

**ECON 801.3
Macro-Economic Theory
1(3L)**

A survey of macro-economic theory, and includes theories of the consumption function, theories of investment, money and interest rates, monetary and fiscal policy, and general equilibrium theory.

**ECON 802.3
History of Economic Theory
2(3L)**

Examines major developments in the history of economic theory.

**ECON 803.6
Contemporary Economic Theory
1&2(3L)**

Examines recent developments in theories of consumer demand and production

**ECON 805.3
Mathematical Analysis in Economics
1/2(3L)**

A study of the mathematical formulation and investigation of economic relationships. Topics include the theory of consumer demand, theory of the individual firm, input-output analysis, models of aggregate economic activity and economic growth.

**ECON 806.3
Monetary Theory
2(3L)**

Examines the relationships between the stock of money and income, employment, and price levels.

**ECON 807.3
Advanced Analysis of Economic
Development
1/2(3L)**

Studies of the economic developments of Canada and the United States are undertaken to apply modern methods, theories, and approaches to understanding Canadian and American economic development. Emphasizes understanding particularly Canadian economic and institutional trends.

**ECON 808.3
Applied Econometrics Model
Building and Estimation
1(3L)**

Deals with Econometric techniques, construction of appropriate econometric models, development of data sets, and estimation and interpretation of results, as they apply to economic problems.

**ECON 809.3
Advanced Techniques in Econometrics
2(3L)**

Considers advanced topics in econometric techniques and examines recent developments in the field as they pertain to economic science.

**ECON 811.3
International Trade Theory
1/2(3L)**

Studies recent developments in the pure theory of trade. Topics include current explanations of patterns of trade and factor movements, the formation of regional free trade areas, commercial policies and international cartels.

**ECON 812.3
International Monetary Economics
1/2(3L)**

The nature of adjustment in open economics, under various international monetary systems, to real and monetary disturbances. The systems investigated will include fixed exchange rates, both with and without sterilization, flexible exchange rates and managed floating.

**ECON 814.3
Economic Growth
1/2(3L)**

The theory of economic growth with topics selected from: the role of technical progress in the growth process, vintage production functions, putty-clay and clay-clay models, Harrod-Domar, Neoclassical and Cambridge growth models.

**ECON 815.3
Economic History of Europe: 1815 to
Present
1/2(3L)**

Industrialization of England and the continent, related to developments in world trade, labour markets, business and labour organization, economic policies, and social institutions. Interwar stagnation, post-World War II recovery and the common market will be considered. The economic relationships between North America and Europe will be taken into account.

**ECON 816.3
North American Economic History
1(3L)**

Examination of economic development in North America since 1800 with particular reference to the role of government.

**ECON 817.3
Economics of Developing Countries
1/2(3L)**

Deals with the theories and policies of economic development primarily in developing countries of the Third World since 1945. Topics include agricultural development, industrial development, international trade, the financing of economic development, and income distribution.

**ECON 820.3
Agricultural Policy
1(3L)**

A study of recent developments in agricultural policy. Particular attention will be paid to the role of agriculture in programs to promote economic growth and development. Major differences in national approaches to the problems of agriculture will also be emphasized.

**ECON 821.3
Industrial Organization and Public
Policy
2(3L)**

An analysis of the functioning of the price system in the market economy with different structures and conduct in order to assess market performance and economic welfare. The analysis will also include an examination of public policies and institutional constraints imposed on the Canadian market economy.

**ECON 823.3
Labour Economics
1/2(3L)**

Prerequisite(s): Graduate standing in economics; or permission of the instructor. The functioning of labour markets including labour supply, labour demand, accumulation of skills, contracts, and unemployment.

**ECON 827.3
Public Utilities Economics
2(3L)**

Analyzes the conduct and performance of telecommunications, airline, electric, pipeline, gas and railway utilities. It will focus on the economics of pricing practices, costing procedures, capitalization, depreciation policy, product strategy, peak loading, technological evolution, rate base definitions, and vertical and horizontal integration in the context of public utilities.

**ECON 830.3
Topics in Public Finance
2(3L)**

A study of modern theoretical constructs and some of their applications. Topics include cost-benefit analysis, fiscal policy, the public debt, analysis of taxes and intergovernmental fiscal relations.

**ECON 831.3
Economics of Natural Resources
1/2(3L)**

Examines the economic theories of natural resource use. Topics include: static and dynamic models of resource use; the problems arising from resource scarcities; criteria for intertemporal resource use; and public resource policies.

**ECON 840.3
Canada-United States Economics and
Political Relations
1&2(3L)**

Recent trends in the economic and political relations between Canada and the United States will be arranged with particular reference to agricultural policies; capital investment; economic fluctuations; energy resources; foreign trade; trade union links; transportation; defence; and institutional arrangements for dealing with joint problems.

**ECON 845.3
Regional and Urban Development
Theory
2(3L)**

Topics include selected aspects of regional and urban development theory and a critical review of recent regional planning programs in advanced countries.

**ECON 898.3
Special Topics
1/2(3L)**

Reading, essays and discussions in an approved special field. This course will be offered only in special circumstances.

**ECON 990
Seminar**

Reports and discussion on current development and research. All graduate students in economics are required to register. Attendance and at least one paper is required for all postgraduate students during their time as a postgraduate student, whether for one year or more.

**ECON 992.6
Project**

A required course for students following the project M.A. option. A research paper on an approved topic must be submitted. The topic may be empirical in nature, or a critical review of the literature, or a critical analysis of some theoretical problem. The

paper will be examined by a supervisor and two other members of the department.

**ECON 994
Research**

Students writing a Master's thesis must register for this course.

EDUCATION

Education courses are listed in the following order of headings:

Continuing Education

Curriculum Studies:

- General Curriculum and Instruction (000)
- English Language and Drama Education (040/070)
- English as a Second Language (090)
- Home Economics/Health Education (030)
- Mathematics and Computational Science Education (010)
- Physical Education (050)
- Religious Studies (090)
- Science Education (020)
- Second Language Education (060)
- Social Studies Education (080)
- Special Topics
- Teaching Effectiveness

Education

Educational Administration

Educational Communications and Technology

Educational Foundations

Educational Psychology and Special Education

Indian and Northern Education

Music Education

Special Education

Technical Education

See also Art Education and School Experiences in the Courses section of the *Calendar*.

CONTINUING EDUCATION

Department of Educational Foundations, College of Education

**EDCNT 410.3
The Adult Educator in Today's Society
1(1L-2S)**

Introduction to the field of adult education. Students will develop an understanding of the scope of the field, current trends and issues, and the role of the adult educator in today's society. Special attention will be given to Native Canadian education, gender issues and education of people with disabilities.

**EDCNT 420.3
Processes in Continuing Education
2(1L-2S)**

Prerequisite(s): Completion of 60 credit units at the university level or permission of the department.

Introduction to planning, conducting, and evaluating continuing education programs in a variety of formal and informal contexts. Students are actively involved in the examination and use of methods and delivery systems. Special attention is given

COURSES • Education – Continuing Education

to Native Canadian education, gender issues and education of people with disabilities.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

EDCNT 498.3 1/2(3S)

GRADUATE COURSES

Department of Educational Foundations, College of Graduate Studies & Research

EDCNT 810.3 Learning for Life: Practice and Theory in Adult Education 1/2(3L)

Prerequisite: Admission to the College of Graduate Studies & Research.

Introduces graduate students from various backgrounds to the scope and aims of modern adult education in all its diversity. The content is significantly shaped by recent studies in Canadian adult education practice and theory and these developments are viewed from international perspectives.

EDCNT 830.3 Historical and Philosophical Foundations of Continuing Education 1/2(3S)

Enables participants to gain an understanding of the history of continuing (adult) education, with emphasis on the twentieth century North American experience. Discusses key movers and shapers of the field of practice. Provides opportunity for conducting historical-philosophical analysis and for identifying perennial ethical, social, and political problems facing adult educators.

EDCNT 840.3 Issues in Continuing Education 1/2(3S)

Prerequisite(s): EDCNT 830 or permission of the instructor.

Builds upon the content of EDCNT 830. In-depth study and analysis of a selected topic or topics related to the history and/or philosophy of continuing (adult) education. Examples: seminal figures in the history of the field; the early literature base of continuing (adult) education; the advocates and opponents of the professionalization of the field of continuing (adult) education; the issue of mandatory continuing education; currently emerging controversial issues which affect decision making in the practice of continuing (adult) education.

EDCNT 872.3 Program Planning of Continuing Education 1/2(2S)

Program development is examined within the context of Continuing Education. Specific elements of the program development process which will be discussed include the planning context, need identification, educational objectives, and learning experiences. Issues related to these concepts will be viewed from a theoretical framework. Participants will have an opportunity to apply or test some of this theory in an educational setting.

EDCNT 875.3 Adult Learning and Development 1/2(2S)

Draws on research and theory in several social sciences to provide an understanding of the changing needs and capacities of adults for learning throughout the life span; optimal learning environments for adults; teacher-learner interaction in adult education; social facilitation of learning.

EDCNT 878.3 Comparative Continuing Education 1/2(2S)

Provides participants with international perspective on the field of adult education. Critical analysis of various approaches to adult education and "development" is encouraged. Ethical questions confronting the individual practitioner will be explored. Previous offerings have included discussion of alternative approaches to research and practice in adult education and have analyzed the work of such adult educators as Myles Horton and Malcolm Knowles, Ivan Illich and Julius Nyerere, John Sewell and Paul Bergevin, Paulo Freire and John Lowe, John Ohliger and Ned Corbett.

EDCNT 880.3 The Community Development Process 1/2(2S)

Community development as a process in effecting social change is examined from historical and philosophical perspectives. Theory and research from the social sciences is utilized as a means for developing analytical and developmental models from which community, change and the community development process might be analyzed. Canadian programs and experiences in community development serve as basic data for the course.

EDCNT 882.3 Evaluation of Continuing Education 1/2(2S)

Selected approaches and models of evaluation are compared and contrasted as they apply to programs of Continuing Education. Students are expected to gain experience in designing evaluation studies and in using the results of evaluation.

EDCNT 885.3 Application of Learning Principles in the Practice of Adult Education 1/2(2P)

Prerequisite(s): EDCNT 875; or permission of the instructor.

Requires participants to undertake the role of facilitator in arranging a learning experience for an adult group, using a variety of adult education procedures. The role of the project will be primarily to help the students gain increased understanding of themselves in facilitating adult learning.

EDCNT 889.3 Selected Topics in Comparative Continuing Education 1/2(2S)

Prerequisite(s): EDCNT 878; or permission of the instructor.

Participants are encouraged to deepen their knowledge and skills in an area of their choice in adult education. In the past, mainstream adult education has been an important area for selection of such topics.

Alternative adult education enterprises have also been a valuable source of subject matter for analysis and discussion: environmentalism, de-schooling, pacifism, and various freedom movements around the world.

EDCNT 890.3 Community Development Practices 1/2(2S)

Using classroom and field community experiences as a means for generating information, the learner examines various community development practices on the Prairies. In so doing learners may assess their own level of competence in putting into practice community development theory, principles, and methods.

EDCNT 891.3 Trends and Issues in Continuing Education 1&2(2S)

Some currently important aspects of the field of adult education are reviewed and analyzed.

EDCNT 892.3 Workplace Learning (Internship) 1/2(100S)

Prerequisite: Admission to graduate program in Adult and Continuing Education, Educational Foundation, or Indian and Northern Education.

Provides a hands-on workplace learning experience in adult and continuing education. The learning experience is monitored throughout by a faculty advisor and a field-based supervisor. Placements are made with organizations that best suit students' academic interests and career aspirations.

EDCNT 897.3 Research Methods in Continuing Education 1/2(2S)

The first part provides background and experiences in the conduct of literary-humanistic historical research in education. The second part deals with the conduct of empirical social science research in education.

EDCNT 898.3 Special Topics

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

CURRICULUM STUDIES

Department of Curriculum Studies, College of Education

Undergraduate and graduate courses in Curriculum Studies are listed in the following order of headings:

Curriculum Research and Development
General Curriculum and Instruction (000)
English Language and Drama Education (040/070)
English as a Second Language (090)
Home Economics/Health Education (030)
Mathematics and Computational Science Education (010)
Physical Education (050)
Religious Studies (090)
Science Education (020)
Second Language Education

Social Studies Education (080)
Special Topics
Teaching Effectiveness

CURRICULUM RESEARCH AND DEVELOPMENT

GRADUATE COURSES

Department of Curriculum Studies, College of Graduate Studies Research

EDCUR 898.3/899.6 Individual Reading - Special Problems in School Subjects 1/2(3R), 1&2(3R)

In order to provide an opportunity for individual study in an area of the student's own interest, a number of individual studies are offered. Each calls for intensive reading or a curriculum project under the guidance of a faculty supervisor. A paper is required. A proposal, representing a contract for the extent and nature of the work to be done, must be approved by a committee consisting of three members of faculty and other professionals of recognized experience and authority in the area. An oral defense of the completed work will be processed by that committee.

EDCUR 990 Seminar in Curriculum Research

A required seminar for Master's and Ph.D. graduate students in Curriculum Studies, taken by all full-time students throughout the academic year. Ongoing research and development projects of faculty and students form the focus of first term seminars, while readings and student-identified issues form the basis for second term seminars. This seminar also provides students with information and guidance to help them profit from their program of studies, and to utilize computer technology effectively. Separate seminars are arranged for Master's and Ph.D. students. Registration in EDCUR 990 seminar is required for one year only.

EDCUR 992.6 Project

Research or curriculum project which is required on the project option for the M.Ed. Each project calls for intensive reading, under the guidance of a staff supervisor. A minor thesis may be required. Alternate requirement may be a curriculum project. The proposal for the minor thesis or for the project, and the oral defense, will be processed by a committee constituted in the same fashion as for a thesis committee.

EDCUR 994 Research

A student undertaking research leading to a Master's thesis must register in this course each year until the thesis is completed.

GENERAL CURRICULUM AND INSTRUCTION

EDCUR 200.3 Curriculum and Instruction 1&2(3L)

Prerequisite(s): EDFDT 101 (or corequisite for Sequential Program students).

Introduces students to the fundamental processes of curriculum development and teaching. Sets out a conceptual framework (the transmission, transaction and

transformation modes of curriculum) and uses that structure to present and critique the K-12 core program of the province. The laboratory component provides students with experiences in learning how to teach, resource-based learning, and the preparation of pedagogical materials.

Note: Students cannot receive credit for both EDCUR 200 and 201.

**EDCUR 201.3
Curriculum and Instruction for
Teacher Associates
1&2(3L)**

Prerequisite(s): EDFDT 101 (or corequisite for Sequential Program students).

Introduces students in the Teacher Associate Certificate Program to the fundamental processes of curriculum development and teaching. Provides students with experiences in learning how to present material through a variety of teaching strategies.

Note: Students cannot receive credit for both EDCUR 200 and 201.

**EDCUR 301.6
Teaching Procedures in the
Elementary School
1&2(3L) or IS/SS(10L)**

An overview and critical assessment of existing practices and of new movements in elementary education. Students will be required to do a considerable amount of reading of the literature in selected journals. Topics include: Children, their needs; and motives; Society's concern for education; The content of elementary education; Planning for instruction: Selecting objectives, Utilizing staff resources, Utilizing space and curriculum resources, Meeting individual differences, Methods in selected subjects of the curriculum, Measurement and evaluation, Reporting.

**EDCUR 305.3
Methods of Teaching in Multi-grade
Classrooms
1/2(3L)**

Prerequisite(s) or Corequisite(s): EDCUR 200

Introduces students to the "Multi-grade Classroom" as an organizational unit for instructional purposes in rural and urban school districts. Emphasis is on the instructional strategies utilized by multi-grade classroom teachers and on the management and organizational skills necessary for teaching in such classrooms.

**EDCUR 401.3
Teaching and Learning in Community
Education
1/2(3L)**

Prerequisite(s): Completion of the Extended Practicum.

This course provides students who have completed their Extended Practicum with additional practical experience in community education in the Saskatchewan context. Students study issues of intercultural education in urban settings, and are expected to spend at least twenty hours working in community schools and other organizational settings.

**EDCUR 402.3
Language, Schools and Society
1/2(3L)**

Prerequisite(s) or Corequisite(s): EDFDT 101.

Provides students with a solid understanding of the nature of language, language and learning, language in schools and society, and language as a human construct.

**EDCUR 405.3
Seminar on Learning and Teaching in
Middle Years
1/3(3S-1P)**

Prerequisite(s): EX PR 402.

Seminar on trends and issues in middle years education. Involves directed readings, seminar discussions, preparation of written work, field trips, and other experiences to aid students in integrating knowledge and abilities acquired from other courses and the extended practicum.

**EDCUR 406.3
Curriculum Development for Post-
internship Students
2(3L)**

Prerequisite(s): EX PR 402.

Students learn the fundamentals of curriculum development within a transactional tradition, critique curricula in their teaching areas, and undertake a curriculum development project in their teaching areas.

Note: For students in areas where no advanced methods courses are available, this course is the preferred alternative.

GRADUATE COURSES

Department of Curriculum Studies, College of Graduate Studies & Research

**EDCUR 801.6
Principles and Practices of
Curriculum Construction
1&2(3L)**

A basic general curriculum theory course. Students investigate the complexities of the procedures, plans, personnel, processes, and problems in curriculum organization. Master's and Diploma candidates in Curriculum Studies are encouraged to complete this course prior to their intramural year.

**EDCUR 802.3
Curriculum Development in
Education
1/2(3L)**

Prerequisite(s): EDCUR 801.

Provides a background for development of curricula in any of the disciplines of the elementary and secondary school and/or upon the total program or a division thereof. Current procedures, innovations, issues and problems are discussed. A study is made of research bearing upon school curricula and current trends.

**EDCUR 804.3
Techniques and Practice of
Curriculum Development
1/2(3L)**

Offers the student an opportunity to develop in a practical setting the skills needed for critically ascertaining educational goals, assessing needs and developing curriculum materials with a team. Focus is

upon schema for curriculum change in each student's own area of specialization.

**EDCUR 805.3
Trends and Issues in Educational
Research and Development
1/2(3L)**

Prerequisite(s): Teaching certificate.

Examines contemporary school curriculum issues in the context of catalysts of change and strategies of change in schools. Attention will be devoted to problems of the design and implementation of a thesis proposal in the College of Education.

**EDCUR 807.3
Language Communication and
Curriculum
1/2(3L)**

Examines the role of languaging processes and communication upon learning in content areas. Specifically, this course will explore the relationship between the structure of language used by students as they learn in specific subject areas and verbal interaction in the classroom.

**EDCUR 809.3
Models and Methods for the
Evaluation of Educational Programs
1(3L-1P)**

Prerequisite(s): EDCUR 801; or permission of the instructor.

Examines current models for the evaluation of educational programs. The emphasis is on exploring the range of options which is available to the program evaluator and on developing an awareness of the strengths and limitations of the models. Problems in carrying out educational evaluations are also studied: examples of such problems are the utilization of evaluation results and the ethics of evaluation.

**EDCUR 810.3
Design and Practice of the Evaluation
of Educational Programs
2(2L-4P)**

Prerequisite(s): EDCUR 809.

Takes the methods of evaluating educational programs and applies them to practical situations in classrooms, schools and school units. Particular attention will be paid to developing an awareness of the breadth of available techniques and to understanding the practical problems which arise in the conduct of evaluations.

**EDCUR 891.6
Adult Basic Education
1&2(2S)**

Deals with the upgrading of skills of adults who are termed functionally illiterate. Examines research in adult basic education, types of programs, selection of candidates, methods and materials of instruction and evaluation of progress.

**ENGLISH LANGUAGE AND DRAMA
EDUCATION**

**EDCUR 273.3
Introduction to Oracy Education:
Oracy and Literature in the
Elementary School
1/2(3L)**

Prerequisite(s) or Corequisite(s): EDCUR 200 and EDFDT 101.

An introduction to the methods available to elementary classroom instructors in the integrated language arts: reading, writing,

listening and speaking. Focuses on the oracy, literature and educational drama aspects of the language arts.

Note: Students with credit for EDCUR 270 or 275 may not take this course for credit.

**EDCUR 275.3
Introduction to Oracy Education:
Oracy and Literature in the Middle
Years School
1(3L)**

Prerequisite(s) or Corequisite(s): EDCUR 200 and EDFDT 101.

Introduction to the methods available to middle years classroom instructors in the integrated language arts: reading, writing, listening and speaking. Focuses on the oracy, literature and educational drama aspects of the language arts.

Note: Students with credit for EDCUR 270 or 273 may not take this course for credit.

**EDCUR 279.3
Literacy in Secondary Classrooms
1/2(3L)**

Prerequisite(s) or Corequisite(s): EDCUR 200 and EDFDT 101.

Provides students with an understanding of secondary education literacy issues in order to improve instruction in content areas through appropriate reading, writing, and oracy strategies. Topics include strategic reading, study skills, writing processes, technical and vocational reading and writing, vocabulary development, assessment, materials selection, computers and resource-based learning, and equity issues.

**EDCUR 349.3
Teaching Drama in the Middle and
Secondary Grades
1/2(3L)**

Prerequisite(s) or Corequisite(s): EDCUR 200 and the completion of at least 12 credit units in drama.

Designed for pre-service teachers of middle and secondary level drama programs. Students will both explore the theoretical bases of drama education and participate in dramatic activities for use both in and out of the classroom.

**EDCUR 370.3
Introduction to Literacy Education:
Reading and Writing in the
Elementary Grades
1(3L-1P)**

Prerequisite(s): EDCUR 200 and 273 or 275.

Introduction to elementary classroom instruction in the integrated language arts: reading, writing, listening and speaking. Highlights reading and writing. Emphasizes instructional principles and strategies through the integration of theory and practice.

Note: Students with credit for EDCUR 376 may not take this course for credit.

**EDCUR 371.3
Developing Writing Abilities
1/2(2L-1P)**

Prerequisite(s): EDCUR 200.

Develops English writing skills and abilities. Some sections make use of computers and other technologies exclusively for instruction.

Note: Students in the secondary option with English as Teaching Area I or II must take either EDCUR 371 or EDCUR 472.

**EDCUR 373.3
Children's Literature in the Primary Grades
1/2(3L)**

Prerequisite(s): EDCUR 200 and 370.
For students preparing to teach reading and language arts to children in grades K-4. An integral part will be to establish a basis for evaluating and selecting books for classrooms. Students will be expected to read at least thirty books chosen from folk literature, poetry, fantasy, and fiction.

**EDCUR 374.3
Children's Literature (Grades 5-8)
1/2(2L-1S)**

Prerequisite(s): EDCUR 370 or 376 or 379.
Students read, discuss and evaluate a sampling of children's literature from several countries and from five genres of literature (realistic fiction, historical fiction, modern fantasy, poetry and informational). Students also learn how to extend children's response to literature and develop short-term units of study.

**EDCUR 376.3
Introduction to Literacy Education: Reading and Writing in the Middle Grades
1(3L-1P)**

Prerequisite(s): EDCUR 200, 273 or 275.
Compulsory for students in the middle years program. An introduction to middle years classroom instruction in the integrated language arts: reading, writing, listening and speaking. Highlights reading and writing. Emphasizes instructional principles and strategies through the integration of theory and practice.

Note: Students with credit for EDCUR 370 may not take this course for credit.

**EDCUR 378.3
Creative Activities in Elementary and Middle Grade Language Arts
1/2(3L)**

Prerequisite(s): EDCUR 200 and Student Teaching.

Deals with the philosophy, materials and methods for introducing creative activities including dramatization of literature and dance. The significance and function of drama in the language arts and other subject areas will be explored.

**EDCUR 379.3
Introductory Methods of Teaching English Language Arts in the Secondary School
2(3L)**

Prerequisite(s): EDCUR 200 and 12 credit units in English.

Introduction to classroom instruction in English language arts, with a special focus on preparation for Extended Practicum. Topics include provincial curriculum, materials selection and preparation; instructional strategies for English language arts, integration of literature, language, reading, writing, speaking, and listening and student assessment.

**EDCUR 442.3
Emergent Literacy: Teaching and Learning English Language Arts in the Primary Grades
1/2(3L)**

Prerequisite(s): EDCUR 370.
Develops an understanding of literacy as social-cultural practice. Emphasis is on the relationship between talk, reading and writing and the young child's own environment in varying cultural and cross-cultural contexts. Students will explore instructional and assessment strategies to support young children's emerging literacy in primary classrooms.

**EDCUR 444.3
Assessment and Instruction of Children Experiencing Reading Difficulties
2(3L)**

Prerequisite(s): EDCUR 370 or 376 and EX PR 402.
Examines procedures and materials for assessing and teaching children who experience difficulty acquiring reading proficiency. The use of daily classroom data and the making of appropriate interventions to foster inner control will be emphasized within the context of the regular classroom.

**EDCUR 449.3
Drama Improvisation: A Method of Teaching the Middle and Secondary Level Language Arts
1/2(3L)**

Prerequisite(s) or Corequisite(s): EDCUR 200 and completion of at least 12 credit units in drama.
Examines the use of drama strategies as a mode of teaching and learning in the middle years and secondary English Language Arts, as well as other curriculum areas. Students will experience drama in education to develop creative, cultural, historic, and critical responses to the core curriculum.

**EDCUR 472.3
Teaching Writing in Middle and Secondary Classrooms
1/2(3L)**

Prerequisite(s): EDCUR 200.
For middle, secondary, and post-secondary teachers of any discipline. Topics include writing process, development of students' writing abilities, evaluation, remediation, grammar and usage, ESL writers, and equity issues. Some sections of this course will use computers and email.

Note: Students in the secondary option with English as Teaching Area I or II must take either EDCUR 371 or EDCUR 472.

**EDCUR 475.3
The Study of Language for Secondary School Teachers
1/2(3L)**

Prerequisite(s): EDCUR 200 and 370 or 376 or 379.
Studies aspects of structural linguistics, traditional grammar, transformational/generative grammar, systemic/functional grammar, and language content, usage, and conventions to enable teachers to develop and evaluate language programs.

Note: Students in the secondary option with English as Teaching Area I or II must take this course.

**EDCUR 476.3
Canadian Children's Literature in the Classroom (K-8)
1/2(2L-1S)**

Prerequisite(s): EDCUR 370 or 376 or 379.
Introduction to Canadian children's literature followed by an exploration of ways to use this literature in teaching several subject-specific pedagogies in the curriculum (K-8). Topics include history of Canadian children's literature, genres, trends and issues, program development, and available forms of assessment.

**EDCUR 479.3
Advanced Methods of Teaching English Language Arts in the Secondary School
2(3L)**

Prerequisite(s): EDCUR 376 or 379 and EX PR 402.
Students reflect on their previous methods courses and Extended Practicum experience and extend their awareness of the teaching of English language arts. Combination of lectures and student seminar presentations which will be in direct response to the students' experiences in the Extended Practicum.

GRADUATE COURSES

Department of Curriculum Studies, College of Graduate Studies & Research

**EDCUR 843.3
Reading: Process and Practice
1/2(3L)**

Provides a theoretical and research basis for understanding reading as a socio-psycholinguistic process. The aim is to seek instructional implications of theory and research as they impact on issues of reading and constructing meaning from written discourse.

**EDCUR 846.3
Advanced Study of Reading Programs
1/2(3P)**

Prerequisite(s): EDCUR 843; or written permission of the instructor.

Provides practical experience in the planning, supervision, and evaluation of reading programs by an analysis of the theoretical and real roles of the teacher, principal, consultant, and administrator.

**EDCUR 870.3
Literacy Education and Curriculum: Research and Scholarship
1/2(3L)**

Prerequisite(s): 12 credit units in English and 6 senior credit units in Language Arts Education; or permission of the instructor.
Examines the field of language education, emphasizing developments at the elementary, middle years and secondary school levels. Topics include language and thought, language and learning, language arts, curricula, resources, writing and the writing process, literature and the response process, and research in language education.

**EDCUR 871.3
Trends and Issues in the Teaching and Study of Language
1/2(3L)**

Prerequisite(s): 12 credit units in English and 6 senior credit units in English Education; or permission of the department.
Includes the study of those aspects of linguistics, including sociolinguistics, psycholinguistics, pragmatics, applied linguistics, and other topics of language and language study, such as syntax and grammar, which have a direct relationship to classroom practice.

**EDCUR 872.3
Trends and Issues in the Teaching and Study of Writing
1/2(3L)**

Prerequisite(s): 12 credit units in English and 6 senior credit units in English Education; or permission of the department.
Covers theories and processes of writing and composing, the teaching of writing, and evaluation and assessment of writing.

**EDCUR 874.3
Trends and Issues in the Teaching and Study of Literature and Response to Literature
1/2(3L)**

Prerequisite(s): 12 credit units in English and 6 senior credit units in English Education; or permission of the instructor.
Includes theory and research on response to literature, the teaching of literature, and literary criticism. Also deals with selection of literature, censorship, and literature-based programs.

**EDCUR 875.3
Ethnographic Studies in Literacy and Language in Educational Settings
1/2(3L)**

Prerequisite(s): EDRES 800.
Enables participants to plan and carry out field-based research in literacy and language. Participants will study and apply ethnographic techniques, including observation, document and artifact collection and interviews, to gather data on literacy and language in classroom settings.

ENGLISH AS A SECOND LANGUAGE

**EDCUR 291.3
An Introduction to the Teaching of English as a Second Language
1/2(3L)**

Prerequisite(s): ENG 110 or equivalent.
Prepares elementary, secondary and community college teachers to teach English as a second language to non-English speaking children and adults. Students will have an opportunity to study and examine: background; socio-cultural considerations; theoretical considerations about language learning comparison of L1 and L2; analysis of the structure of English; issues and problems inherent in the acquisition of second language; and introduction to specific instructional techniques for teaching a second language.

EDCUR 391.3
Theory of Second Language Learning and Methods of Skills Development
 1/2(3L)

Prerequisite(s): EDCUR 291 or equivalent and permission of the department.

The second of a 4-course sequence designed to prepare elementary, secondary, and community college teachers to teach English as a second language to non-English speaking children and adults. Includes second language learning theories, the psychology of second language learning, ESL Materials, analysis of written language, materials of teaching, and oral language in the ESL program and the evaluation of oral language.

EDCUR 393.3
Advanced Methods of Teaching English as a Second Language
 1/2(3L)

Prerequisite(s): EDCUR 391 or equivalent and permission of the department.

Provides for intensive training in the theories and techniques of English as a second language; the extensive development of learning materials; the development of techniques of assessing students' problems in speaking and writing English; developing techniques for solving existing problems and for providing the opportunity to study more intensively the structure of the English language.

EDCUR 491.3
Program Planning and Evaluation in Teaching English as a Second Language
 1/2(3L)

Prerequisite(s): EDCUR 393.

An introduction to the principles and procedures for conducting a needs assessment of ESL students; program planning for their needs, and evaluating their language proficiency; and procedures for evaluating ESL instructional resources and program outcomes. Includes a practicum in program planning and evaluation.

HOME ECONOMICS / HEALTH EDUCATION

EDCUR 336.3
Teaching Home Economics in the Elementary/Middle Grades
 2(2L-1P)

Prerequisite(s): EDCUR 200 and HED 111 and HED 142 or permission of the department head.

Introduces students to home economics education for the elementary/middle years. Provides opportunities for examining Saskatchewan home economics curricula, exploring various teaching strategies, developing resource files, integrating concepts with other subject areas, and identifying and analyzing current issues and trends in home economics education.

EDCUR 337.3
Teaching Home Economics in the Secondary Grades
 2(2L-1P)

Prerequisite(s): EDCUR 200 and HED 111 and HED 142 or permission of the department head.

Introduces students to home economics education for secondary schools. Provides opportunities for examining Saskatchewan home economics and related curricula, exploring various teaching strategies, developing resource files, integrating concepts with other subject areas, and identifying and analyzing current issues and trends in home economics education.

EDCUR 338.3
Teaching Health in the Elementary/Middle Years
 1/2(3L)

Introduces the Saskatchewan health curricula for grades one to nine. It provides opportunities for integrating the Common Essential Learnings into health curricula; exploring various teaching strategies; developing resource files; identifying and analyzing current concerns/issues in health education; and examining teachers' responsibilities as active participants in school health programs.

EDCUR 437.3
Advanced Methods for Teaching Home Economics
 2(3L)

Prerequisite(s): EX PR 402 and 12 credit units H ED

Provides beginning teachers the opportunity to extend their education in home economics through reflection on their internship experience and a critical examination of teaching materials, a study of home economics education curriculum in Canada and abroad, and research on current issues and trends in home economics.

MATHEMATICS AND COMPUTATIONAL SCIENCE EDUCATION

EDCUR 311.3
Teaching K-9 Mathematics Part 1
 1/2(3L)

Prerequisite(s) or Corequisite(s): EDCUR 200.3 or permission of the department.

Designed to prepare students for teaching K-9 provincial mathematics curriculum and to improve their knowledge of mathematics, especially in the areas of problem solving, data management, numeration, calculation, and fractions. Students will become familiar with the current curriculum and useful support materials including manipulatives, print resources and other useful media. *Note:* Only for students in the ITEP and SUNTEP programs. Completion of both EDCUR 311.3 and EDCUR 316.3 satisfy the math methods and External math requirements for the College of Education. Completion of only one of these courses will satisfy neither requirement.

EDCUR 312.3
Teaching Elementary School Mathematics
 1/2(3L)

Prerequisite(s) or Corequisite(s): EDCUR 200.

Helps prospective elementary school teachers develop instructional techniques that reflect current knowledge of mathematics, learning theories such as constructivism, and classroom practice. It includes the K-5 elementary mathematics curriculum and useful resource materials including manipulatives, textbooks and

other print material, computer software, videos, calculators, and children's literature.

Note: Students may receive credit for only one of EDCUR 312, 313, 315 and 317.

EDCUR 316.3
Teaching K-9 Mathematics Part 2
 1&2(3L)

Prerequisite(s) or Corequisite(s): EDCUR 200.3 or permission of the department.

Designed to prepare students for teaching K-9 provincial mathematics curriculum and to improve their knowledge of mathematics, especially in the areas of measurement including the Pythagorean theorem, geometry, (polygon properties, symmetry, tessellations), ratio and proportion, integers, and number theory. Students will become familiar with the current curriculum and useful support materials including manipulatives, print resources and other useful media.

Note: Only for students in the ITEP and SUNTEP programs. Completion of both EDCUR 311.3 and EDCUR 316.3 satisfy the math methods and External math requirements for the College of Education. Completion of only one of these courses will satisfy neither requirement.

EDCUR 317.3
Teaching Middle Years Mathematics
 1/2(3L)

Prerequisite(s) or Corequisite(s): EDCUR 200.

Helps prospective middle years teachers develop instructional techniques that reflect current knowledge of mathematics, learning theories such as constructivism, and classroom practice. Students will become familiar with the Grade 6-9 mathematics curriculum and useful resource materials including manipulatives, textbooks and other print material, computer software, videos and calculators.

Note: Students may receive credit for only one of EDCUR 312, 313, 315 and 317.

EDCUR 318.3
Methods of Teaching Mathematics in the Secondary School
 1/2(3L)

Prerequisite(s): 12 credit units in mathematics.

Prerequisite(s) or Corequisite(s): EDCUR 200.

An introductory mathematics methods course for prospective secondary students. Topics include the current secondary mathematics curriculum, forces affecting the curriculum, and teaching methodology. Emphasis is on the development of problem solving skills, the use of manipulatives, and the use of computational technology to support instruction in mathematics.

EDCUR 410.3
Diagnostic-Prescriptive Teaching in Mathematics
 2(2L-1P)

Prerequisite(s): One of: EDCUR 312, 317, 318, or 311 and 316; and EX PR 402.

Acquaints students with the diagnostic-prescriptive model of instruction. Students learn to use a variety of formal and informal diagnostic approaches to design appropriate corrective instruction for all students but particularly for special needs

students. A weekly practicum with at least one student experiencing difficulties with mathematics is required.

EDCUR 418.3
Advanced Methods of Teaching Secondary School Mathematics
 1/2(3L)

Prerequisite(s): EDCUR 318 and EX PR 402.

Provides opportunities for secondary program students to reflect on previous courses, to research and report on topics related to their Extended Practicum experiences, and to investigate available technologies for teaching mathematics.

GRADUATE COURSES

Department of Curriculum Studies, College of Graduate Studies & Research

EDCUR 816.3
Theory and Practice of Teaching Mathematics
 1/2(3L)

Prerequisite(s): 3 credit units in psychology of learning; 3 credit units in methods of teaching mathematics; 12 credit units in mathematics.

Current practices used in the classroom will be related to the various theories of how children learn mathematics. Emphasis will be placed upon the mathematical implications and recent works of prominent individuals such as Piaget, Ausubel, Bruner, Davis, Dienes, Gagne, Skemp, Suppes, and others. Alternate classroom techniques in the teaching of mathematics will be examined in the light of basic research done by these theorists.

EDCUR 817.3
Design and Use of the Mathematics Laboratory
 1/2(3L)

Prerequisite(s): 3 credit units in teaching of mathematics; 12 credit units in mathematics.

Emphasizes the role of the laboratory in the elementary school mathematics program. Organizing and supervising the laboratory approach, planning laboratory investigations, facilities for and assessing the effectiveness of the laboratory approach will be topics examined in this course. A further consideration will be an examination of the value of the laboratory in the teaching of mathematics to the low achiever. This course is a sequel to EDCUR 816.

EDCUR 818.6
Special Problems in the Teaching of Mathematics in the Secondary School
 1&2(3L)

Prerequisite(s): 3 credit units in teaching of mathematics in the secondary school; 24 credit units in mathematics.

Emphasizes the problems surrounding the teaching of secondary school mathematics courses. Problem areas in the teaching of general mathematics, elementary algebra, geometry, and trigonometry will be identified and alternate approaches discussed. Curricula recommendations in these subject matter areas will also be discussed. An examination of various proposals for the twelfth grade mathematics program will be included.

**EDCUR 819.3
Trends and Issues in Mathematics Education
1/2(3L)**

Prerequisite(s): 12 credit units in mathematics and 6 senior credit units in mathematics education.

Designed to acquaint advanced students with recent literature in the field of mathematics education. It will focus upon current problems and contemporary research in elementary and secondary school mathematics.

PHYSICAL EDUCATION

**EDCUR 352.3
Physical Education in Elementary Schools
1/2(3L)**

Prerequisite(s) or Corequisite(s): EDCUR 200 and KIN 145.

Familiarizes elementary students with theoretical and practical material in Physical Education at the elementary school level. Particular emphasis will be placed upon the selection of the movement activities and their progression as related to growth and development characteristics of the elementary school child.

Note: Students may receive credit for only one of EDCUR 352, 353, 355 and 356.

**EDCUR 356.3
Physical Education in Middle Years
1/2 (3L)**

Prerequisite(s) or Corequisite(s): EDCUR 200 and KIN 145.

Familiarizes middle years students with theoretical and practical material in Physical Education at the middle years school level. Particular emphasis will be placed upon the selection of the movement activities and their progression as related to growth and development characteristics of the adolescent child.

Note: Students may receive credit for only one of EDCUR 352, 353, 355 and 356.

**EDCUR 357.3
Methods for Secondary Physical Education
1/2(3L)**

Prerequisite(s) or Corequisite(s): EDCUR 200 or permission of the department head.

For prospective secondary teachers of physical education. The philosophy, objectives, teaching methods, and evaluation of secondary school physical education programs are emphasized. Students are given opportunities to gain experience in planning, implementing and evaluating physical education classes and programs.

**EDCUR 454.3
Advanced Methods of Physical Education in the Elementary and Middle Schools
1/2(3L)**

Prerequisite(s): EX PR 402 and 9 credit units in kinesiology.

Provides prospective physical education teachers with the ability to understand, recognize, analyze, and demonstrate the range of teaching skills employed by successful physical education teachers in the elementary and middle school years. Emphasis is on understanding the theoretical implications of different teaching

approaches and the context in which they are effective.

RELIGIOUS STUDIES

**EDCUR 392.3
Teaching Religion in the Elementary/Middle Years
1/2(3L)**

Prerequisite(s): 12 credit units in Religious Studies or permission of the department head.

Prerequisite(s) or Corequisite(s): EDCUR 200.

Reviews the methods of teaching religious education in the elementary and middle school. The curriculum requirements of the Department of Education will be examined, and the appropriate methods for teaching these requirements will be reviewed in the context of the child's faith development and the specific school situations in which the teaching will occur.

Note: Students with credit for EDCUR 394 may not take this course for credit.

**EDCUR 394.3
Teaching Religion in the Secondary School
2(3L)**

Prerequisite(s): 12 credit units in Religious Studies.

Prerequisite(s) or Corequisite(s): EDCUR 200.

Reviews the methods of teaching religious education in the secondary school. The curriculum requirements of the Department of Education will be examined, and the appropriate methods for teaching these requirements will be reviewed in the context of adolescent faith development and the specific school context and situation in which the teaching will occur.

Note: Students with credit for EDCUR 392 may not take this course for credit.

SCIENCE EDUCATION

**EDCUR 322.3
Teaching Science in Elementary Schools
1/2(3L)**

Prerequisite(s) or Corequisite(s): EDCUR 200.

Students will be introduced to teaching children science and to the Saskatchewan Science Curriculum for the Elementary Level. Various methods and resources needed to teach the Curriculum at this level will be demonstrated. Specific issues related to Science Education will be explored.

Note: Students may receive credit for only one of EDCUR 322, 323, 324 and 325.

**EDCUR 324.3
Teaching Science in Middle Years Schools
1/2(3L)**

Prerequisite(s) or Corequisite(s): EDCUR 200.

Students will be introduced to teaching middle level students science and the Saskatchewan Science Curriculum for the Middle Level. Various methods and resources needed to teach the Curriculum at this level will be demonstrated. Specific issues related to Science Education will be explored.

Note: Students may receive credit for only one of EDCUR 322, 323, 324 and 325.

**EDCUR 327.3
Methods for Teaching Life Sciences in the Secondary School
1/2(3L)**

Prerequisite(s): BIOL 253 (or introductory university-level course in ecology) and 9 other credit units in biology.

Prerequisite(s) or Corequisite(s): EDCUR 200.

Students will develop and demonstrate an informed and practical philosophy of teaching the life sciences by exploring the nature of science, reflecting on the pedagogical implications of provincial science curriculum intentions and examining how current research in science education informs planning, the development of resource materials, and teaching methodologies.

**EDCUR 328.3
Methods for Teaching Physical Sciences
1/2(3L)**

Prerequisite(s): 12 credit units in chemistry, geology, physical geography or physics.

Prerequisite(s) or Corequisite(s): EDCUR 200.

Students will develop a series of conceptual frameworks that have practical implications for reflecting on classroom practice. Topics include: curriculum intentions, the nature of the scientific enterprise, concept development, assessment and evaluation, and pedagogical methods and strategies that support curriculum intentions.

**EDCUR 420.3
Advanced Methods for Teaching Science in the Elementary and Middle Years Schools
2(3L)**

Prerequisite(s): EX PR 402 and BIOL 253 (or introductory university-level course in ecology) and 9 other credit units in a natural science.

Provides beginning teachers the opportunity, through seminars, collaborative investigations, and critical exploration of curriculum materials, to extend and develop from previous studies of science education the knowledge, leadership skills and expertise to support and advance science education in elementary and middle years schools.

**EDCUR 421.3
Epistemology and Sociology of Science for Teaching
1/2(3L)**

Prerequisite(s): EDCUR 200 and 18 credit units in the natural sciences.

Students examine how scientists know what they know, what kind of knowledge this is, how the social and technological milieu interactions with scientists and their knowledge, and implications for teaching science. Emphasis is given to analyzing scientific events from a number of different perspectives: historical, philosophical, sociological, and pedagogical.

**EDCUR 423.3
Advanced Methods for Teaching Science in Secondary School
1/2(3L)**

Prerequisite(s): EDCUR 327 or 328 and EX PR 402 and 12 credit units in the natural sciences.

Provides beginning teachers the opportunity through seminars, reflection on their internship experience, research, and critical exploration of curriculum materials to extend and develop from previous studies of science education the knowledge, leadership skills and expertise for excellence in teaching science at the secondary level.

GRADUATE COURSES

Department of Curriculum Studies, College of Graduate Studies & Research

**EDCUR 820.3
Introduction to Graduate Studies in Science Education
1/2(3L)**

Prerequisite(s): 6 credit units of undergraduate-level science methods courses; 24 credit units of natural science courses (as defined by the Arts and Science section of the Calendar); or permission of the department.

A survey of advanced studies in science education, prerequisite to all other graduate courses in science education. Topics include: the nature of the scientific enterprise; the interactions of science with society, stressing the implications to science education; new curriculum developments; objectives; and current issues and trends. Special emphasis will be placed on the philosophy and methodology inherent in these topics.

**EDCUR 821.3
Advanced Studies in Science Education
1/2(3L)**

Prerequisite(s): EDCUR 820.

A continuation of EDCUR 820, but with more emphasis on individual and group projects. The major topic will be a survey of research in science education. Additional topics will be supplementary to EDCUR 820 and dependent on the interest and needs of the students.

**EDCUR 827.3
Colloquium in Science Education I
1/2(3S)**

A seminar in which students will be encouraged to examine and present materials and ideas at the frontier level of science education. Contributions will be made by faculty members from science education and other departments.

**EDCUR 828.3
Colloquium in Science Education II
1/2(3S)**

Prerequisite(s): EDCUR 827.

An advanced seminar in science education. Contributions will be made by students and faculty.

SECOND LANGUAGE EDUCATION

**EDCUR 161.6
Beginning Oral French
1&2 SS(30P)**

Designed for those who have never studied French or who are extremely limited in their oral communication in French. Based on the communicative approach of language instruction.

**EDCUR 162.6
Intermediate Oral French
1&2 SS(30P)**

Prerequisite(s): Permission of the department.

Designed for those who have a basic knowledge of French and want to improve their ability to communicate orally. Emphasizes communication used in everyday settings.

**EDCUR 362.3
Introduction to Principles and Practices of Second Language Teaching
2(3L)**

Prerequisite(s): Excepting ESL students, at least 12 credit units in a modern language, other than English.

Prerequisite(s) or Corequisite(s): EDCUR 200.

For prospective teachers of any second language offered in elementary and secondary schools. Involves a study of major theories of second language acquisition and use in various contexts, and their relevance to language teaching approaches. Emphasis is on communicative/experiential and content-based approaches.

**EDCUR 363.6
Advanced Oral French
1&2 SS(30P)**

Prerequisite(s): Permission of the department.

Designed for native and non-native speakers of French who want to maintain and improve their oral fluency. Emphasizes idiomatic expression, dialogues, debates and oral presentations.

**EDCUR 460.3
Methods of Teaching International Languages in Elementary, Middle and Secondary Years
2(3L-1P)**

Prerequisite(s): EDCUR 362.

For prospective teachers of any second language offered in elementary and secondary schools. Involves application of the major principles of second language teaching and learning. Critical analyses of commonly used methods as well as analysis and development of curricular materials will be involved. In a laboratory setting, students will demonstrate their ability to put communicative language teaching principles into practice.

**EDCUR 462.3
Advanced Methods of Teaching French as a Second Language in the Elementary and Middle Years
2(3L-1P)**

Prerequisite(s): EX PR 402 and intermediate-level proficiency in French.

Allows students to apply the major principles of second language teaching to practical situations in the elementary and middle years. Emphasizes practicing appropriate elementary and middle years language teaching methods, designing communicative activities, communicative lesson planning and implementation, experiential unit planning, examining and using elementary and middle years curriculum guides and commercial

programs, and using communicative assessment techniques.

Note: Students with credit for EDCUR 463 may not take this course for credit.

**EDCUR 463.3
Advanced Methods of Teaching French as a Second Language in the Secondary School
2(3L-1P)**

Prerequisite(s): EX PR 402 and intermediate-level proficiency in French.

Allows students to apply the major principles of second language teaching to practical situations in the secondary school.

Emphasizes practicing appropriate language teaching methods and designing communicative activities appropriate to the secondary school, communicative lesson planning and implementation, experiential unit planning, examining and using curriculum guides and commercial programs for the secondary school, and using communicative assessment techniques.

Note: Students with credit for EDCUR 462 may not take this course for credit.

**EDCUR 464.6
Refinement of Oral French
1&2 SS(30P)**

Prerequisite(s): Permission of the department.

Designed to refine spoken French and to develop mastery of various language registers through individual presentations, spontaneous and prepared improvisation, and other situational oral language activities.

**EDCUR 466.3
Methods of Teaching Ukrainian in Elementary, Middle and Secondary Schools
1&2 SS(3L)**

Prerequisite(s): EDCUR 362 or permission of the department; EX PR 402 or teaching experience; intermediate-level proficiency in Ukrainian.

For prospective teachers of Ukrainian in both core and bilingual programs. Emphasis is on practising appropriate language teaching methods, designing communicative activities, examining commercial programs and using communicative assessment. Conducted largely in Ukrainian.

GRADUATE COURSES

Department of Curriculum Studies, College of Graduate Studies & Research

**EDCUR 860.6
Methods of Teaching French (Advanced)
1&2(3L)**

Prerequisite(s): Permission of the instructor.

Methods of teaching French as a second language with concentration on current issues in French Education.

SOCIAL STUDIES EDUCATION

**EDCUR 382.3
Teaching Elementary Social Studies
1/2(3L)**

Prerequisite(s) or Corequisite(s): EDCUR 200.

Focuses on teaching Social Studies in primary and elementary schools. It is an activity-oriented course which provides

students with opportunities to participate in instructional methods and approaches for children.

Note: Students may receive credit for only one of EDCUR 382, 383, 385 and 387.

**EDCUR 386.3
Teaching Social Studies in the Secondary School
2(3L)**

Prerequisite(s): 12 credit units in history, human geography, economics, or native studies.

Prerequisite(s) or Corequisite(s): EDCUR 200.

Identifies major concepts selected from history, geography and other social sciences. Emphasis is placed upon the learner's ability to demonstrate skill in selecting methods, strategies, materials and forms of evaluation in social studies. In turn, there will be an in-depth examination of the Saskatchewan secondary social studies curriculum.

**EDCUR 387.3
Teaching Social Studies in Middle Years
1/2(3L)**

Prerequisite(s) or Corequisite(s): EDCUR 200.

Introduces students to Social Studies education at the middle years level including examination of its disciplinary foundations and issues central to recent developments in the field. Emphasis will be on instructional methods and classroom approaches congruent with the goal of developing reflective and responsible citizens for a multicultural society.

Note: Students may receive credit for only one of EDCUR 382, 383, 385 and 387.

**EDCUR 482.3
Advanced Methods in Teaching Social Studies in Elementary and Middle Years
1/2(3L)**

Prerequisite(s): EDCUR 382 or 387 and EX PR 402.

Focuses on a critical analysis and comparison of a variety of methods and techniques. Topics include values education, inquiry, gender equality, aboriginal issues, multiculturalism, global studies and futurism.

**EDCUR 488.3
Advanced Methods in Teaching Secondary School Social Studies
1/2(3L)**

Prerequisite(s): EDCUR 386 and EX PR 402.

A critical analysis of the methodological approaches for teaching secondary school social studies. New programs, curricula and materials will be examined (and developed) in light of the compelling need to include the historical contributions of women, aboriginal peoples, and other groups, in social studies curricula.

GRADUATE COURSES

Department of Curriculum Studies, College of Graduate Studies & Research

**EDCUR 887.3
Issues and Trends in Social Studies Education I
1/2(3L)**

Prerequisite(s): At least 3 credit units in the methods of teaching social studies plus at

least 12 senior Arts and Science credit units in the social sciences.

A variety of issues and trends across the whole field of Social Studies Education. Issues to be identified and analyzed are: the place of the social science disciplines in social studies education; the objectives of social studies education; the various patterns for organizing curricula; the various types of methods, the use of various types of materials, and methods of evaluation.

**EDCUR 888.3
Issues and Trends in Social Studies Education II
1/2(3L)**

Prerequisite(s): At least 3 credit units in the methods of teaching social studies plus at least 12 senior Arts and Science credit units in the social sciences.

Extends beyond the identification and understanding of theories related to Social Studies Education as explored in EDCUR 887 to an evaluation of theoretical issues as they are applied to actual programs and materials. Focus is on research and development. Included are analyses of Social Studies curricula; the evaluation of materials and programs in terms of value development, skill processes, and cognitive orientations; viewing curricular and methodological strategies in Social Studies from the perspectives of evaluation and research; opportunities to develop and critique instructional materials and associated teaching methodologies.

**EDCUR 889.3
Canadian Social Studies Education
1/2(3L)**

Prerequisite(s): At least 3 credit units in the methods of teaching social studies plus at least 12 senior Arts and Science credit units in the social sciences.

Designed for senior or graduate students wishing to specialize in Social Studies Education. The present status and structure of Social Studies Education in Canada will be examined through its philosophical and historical development. Canadian Social Studies curricula will be surveyed in order to determine the contributions made by the various Social Science disciplines. Special attention will be given to strategies, materials and processes developed in Canadian Studies Projects and their implications for Canadian Social Studies Education.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

EDCUR 298.3 1/2(3S)

EDCUR 398.3 1/2(3S)

EDCUR 498.3 1/2(3S)

TEACHING EFFECTIVENESS

GRADUATE COURSES

Department of Curriculum Studies, College of Graduate Studies & Research

**EDCUR 830.3
Research in Teaching Effectiveness
1/2(3L)**

Prerequisite(s): A valid teaching certificate; 3 years of successful teaching

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experience; an undergraduate degree in Education.

Designed to provide students the opportunity to learn the magnitude of research in teaching and to become familiar with the knowledge of effective teaching resulting from the research. Content will be organized by areas of concentration of research and the contributions of major researchers. Regular observations in classrooms will provide an opportunity to identify teaching behaviours discussed in the research. Students will be required to demonstrate their effectiveness in teaching in the classroom.

EDCUR 831.3 **Analysis of Teaching** **1/2(3L)**

Prerequisite(s): Research in Teacher Effectiveness; three years of successful teaching experience; an undergraduate degree in Education.

Provides knowledge of models and methods of teaching which provide the parameters for analyzing micro teaching behaviours. Students will be expected to be competent in identifying and demonstrating models as well as analyzing the model itself.

EDCUR 832.3 **Practicum** **1/2(3P)**

Requires students to apply in schools the knowledge of teaching and/or supervision studied in course work. The specific in-school activities will include working in a classroom, with a teacher or intern and with a group of teachers conducting an in-service program.

EDUCATION

College of Education

EDUC 403.3 **Selected Issues in Education**

Students will study in-depth selected educational issues. Credit for the course as an Education elective would require the permission of a program counsellor and the content of the course must have prior approval of faculty.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the Undergraduate Programs Office for more information.

EDUC 498.3 1/2(3S)

GRADUATE COURSES

College of Graduate Studies & Research

EDRES 800.3 **Research Methods: Introductory** **Level** **1/2(2L-2P)**

Introduction to research methods, with special reference to research in Education. The basic principles of research, both quantitative and qualitative, are discussed. Skills necessary for the production of research proposals are developed, e.g. techniques for surveying the research literature, and the collection and analysis of data.

EDRES 840.3 **Statistical Methods: Intermediate** **Level** **1/2(3L-1P)**

Prerequisite(s): Permission of the instructor.

Selected parametric and non-parametric inferential tests. Analysis of variance, one-way and factorial designs, planned and post-hoc comparisons. Computer applications of these techniques with real and/or artificial educational and social science data will be an essential component.

EDRES 841.3 **Statistical Methods: Advanced Level** **2(3L-1P)**

Prerequisite(s): EDRES 840.

Selected experimental and quasi-experimental designs relevant for research in education and behavioral sciences. Multiple and step-wise regression. Introduction to selected multivariate techniques. The use of the various techniques in actual and simulated data in education and behavioral sciences will be an essential component.

EDRES 845.3 **Research Methods: Naturalistic** **(Intermediate)** **(3S)**

Prerequisite(s): EDRES 800.

Offers the opportunity to learn and practice inquiry processes for conducting naturalistic (qualitative) research. Within selected theoretical frameworks, the following techniques will be studied: framing the study, participant observation, interviewing, analytic induction and constant comparison, reporting.

EDRES 898.3 **Special Topics** **1/2**

EDUC 899.6 **Reading Course: Individual Reading** **and Study** **1&2(1T-8R)**

Provides an opportunity for students to pursue a topic of an interdisciplinary nature or multi-departmental concern. The topic must fall outside the scope of courses offered, although this provision may be waived with the consent of the departments involved. The student is responsible for defining the area of interest and the approval of the project by the sponsoring and cooperating departments must be gained prior to registration. The student undertakes intensive reading under the guidance of a staff supervisor and advisory committee and submits a major paper for assessment.

EDUC 992.6 **Project**

The research or developmental project, required on the project option for the M.Ed., where the nature of the research or developmental project is interdisciplinary or multi-departmental. The project must be accepted by a committee consisting of members from the sponsoring and co-operating departments and evaluated by this committee plus an external member.

EDUCATIONAL ADMINISTRATION

Department of Educational Administration,
College of Education

EDADM 422.3 **The Teacher in the School** **Organization** **1/2(3L)**

Prerequisite(s): Admission to the College of Education and completion of 60 credit units at the university level.

Familiarizes prospective and practising teachers with the nature of school structures and social systems, and examines the effects of the organization and group interaction patterns on the school experiences of individual teachers.

EDADM 423.3 **The Teacher and School Improvement** **1/2(3L)**

Prerequisite(s): Admission to the College of Education and completion of 60 credit units at the university level.

Prospective and practising teachers will explore trends and issues in school improvement, innovations, and effectiveness. Research on school effectiveness in various countries will be examined, and models of school improvement employed in specific schools and school systems will be assessed.

EDADM 424.3 **The Teacher as Leader** **1/2(3L)**

Prerequisite(s): Admission to the College of Education and completion of 60 credit units at the university level.

Provides a comprehensive understanding of concepts of leadership by integrating theory, research, philosophy, and practice. Students will discuss the history and nature of leadership; the tasks, contexts, attributes, and powers associated with leadership; and the related roles of the teacher as leader.

EDADM 425.3 **The Legal and Institutional Contexts** **of Education** **3(3L)**

Prerequisite(s): EX PR 402.

Students will integrate the knowledge and experience acquired in earlier coursework and the extended practicum by examining the components of governmental, administrative, legal, ethical and professional aspects of public education in Saskatchewan and Canada.

Note: Students with credit for EDADM 321 may not take this course for credit.

GRADUATE COURSES

Department of Educational Administration,
College of Graduate Studies & Research

EDADM 810.3 **Change Theory and Innovation in** **Education** **1/2(3S)**

Prerequisite(s): EDADM 811.

Includes presentation of theories regarding changes in education. Forces affecting change in education are studied in detail through a case study approach. Special attention is given to the role of administrators and to methods for improving the process of change in education.

EDADM 811.3 **History and Development of** **Organizational Theory** **1(3S)**

Traces major theories through the evolution of organizational thought, and examines recent trends in the study of organizations. A variety of schools of thought are investigated and utilized as perspectives from which to view educational organizations. The content is designed to provide a basis for further in-depth study of concepts and processes in educational settings.

EDADM 812.3 **Educational Finance** **1/2(3S)**

Financing public education; educational revenues and expenditures; principles underlying grants systems for education; alternative models for financing public education; taxation and principles of taxation; financial administration in local school systems; cost-quality relations in education; trends in educational finance; financial planning in times of retrenchment.

EDADM 813.3 **Educational Planning** **1/2(3S)**

Designed to provide individuals with a knowledge of educational planning at the Board of Education level. Includes such theoretical aspects as the nature of educational planning, planning concepts, and approaches and models. Investigates applied aspects such as data collection, demographic analysis and enrolment forecasting, school facilities, master plans, and new planning techniques.

EDADM 816.3 **Instructional Leadership and School** **Management** **1(3S)**

Prerequisite(s): EDADM 811.

Focuses on the formal and informal organization of the school. The leadership styles of principals and vice-principals, as they affect curriculum development, implementation and evaluation, will be studied. Emphasis will be placed on organizational development strategies.

EDADM 817.3 **Supervision for the Improvement of** **Classroom Instruction** **2(3L)**

Deals with the development of supervisory skills through the process of clinical supervision. Attention will be given to the role expectations of personnel involved in the supervisory process and the nature of the supervisory process as it involves classroom teachers and principals.

EDADM 820.3 **Administrative Roles in School** **Systems** **1/2(3S)**

Prerequisite(s): EDADM 811.

Examines the roles of various educational administrators: vice-principal, principal, assistant director and director. The relationships and functions associated with each of these roles will be examined from several perspectives - legislation, theoretical models, role theory, and research findings. The specific content will

address means by which these roles can lead to effective administrative practice.

**EDADM 821.3
Perspectives of Organizational
Behaviour
1/2(3S)**

Prerequisite(s): EDADM 811.

Focuses on behaviour within the formal and informal contexts of the educational system. It includes such topics as motivation, group processes, communication, decision making, conflict management, leadership, power and authority.

**EDADM 822.3
Economics of Education
1/2(3S)**

Concepts fundamental to an analysis of education from an economic perspective; relationships between education and the economy, and education and personal income; human capital; cost-benefit analysis in education; the planning of human resources development.

**EDADM 823.3
Planning and Management of
Educational Facilities
1/2(3S)**

Prerequisite(s): EDADM 813; or permission of the department.

An intensive course in the planning and management of the physical and functional aspects of elementary and secondary schools. Both theory and applications are studied. Topics include the purpose and nature of educational facilities, determining program needs, emerging awareness of facility requirements, specific facility planning activities and procedures, operationalizing new and altered facilities, evaluating completed projects, strategies for effective and efficient operation and maintenance, terminating obsolete and redundant facilities and developing an overall facility program for the school system.

**EDADM 824.3
Structure and Organization of
Education in Canada
1/2(3S)**

Traces the historical basis and development for the present forms of education in the various provinces in Canada. It explores the current structure and organization of education in different provinces. Finally, it studies the issues and problems germane to the Canadian educational scene.

**EDADM 825.3
Educational Administration and the
Law
1/2(3S)**

Deals with constitutional law as applied to education and language, intentional wrong and defenses, the various aspects of negligence and its defenses, occupier's liability, employer's liability, administrative law, defamation, and human rights. Wherever relevant, a parallel tie-in will be made with statute law.

**EDADM 826.3
Personnel Administration
1/2(3S)**

Prerequisite(s): EDADM 811.

Designed to provide a review of the literature in personnel administration in education and exposure to applications in human resources management. The topics

addressed include manpower planning, recruitment of personnel, selection of personnel, placement and induction of personnel, staff development, appraisal of personnel, administration of collective agreements, legal aspects of personnel administration and supervisory practices.

**EDADM 827.3
Administration in Continuing
Education
1/2(2S)**

Assessments of various approaches to administration related particularly to public educational programs directed at social and technological change; case studies useful in administering continuing education programs.

**EDADM 829.3
School Improvement
1/2(3S)**

Focuses on organization development as a planned and sustained effort to apply behavioral science and school effectiveness research to school and system improvement. Strategies which involve school and system members themselves in the assessment, diagnosis and transformation of their own school organization will be studied in detail.

**EDADM 834.3
Case Studies in Leadership Ethics
1/2(3L/S)**

Prerequisite(s): EDADM 811.

Considers issues and dilemmas arising from a wide variety of educational leadership cases. Classical and contemporary moral philosophies as well as professional ethics will be utilized to examine these problematic cases. The challenges associated with developing ethical frameworks for decision-making and with promoting ethical consciousness and competencies in particular education settings will be explored.

**EDADM 835.3
Governance and Decision Making in
Education
1/2(3S)**

Prerequisite(s): EDADM 811.

Deals with the use of political, jurisprudential and organizational theories to better understand and analyse educational governance at state, system, and site-based levels. The course includes the application and assessment of various models and mechanisms of educational policy and decision making. Consideration will be given to the evolving roles and relationships of interest groups, interagency personnel, professional educators, legislators, executives, the judiciary and citizens.

**EDADM 836.3
Leading Community Relations in
Education
1/2(3L)**

Prerequisite(s): EDADM 811.

Deals with issues, principles and strategies used to develop and maintain learning communities and effective community relations. Topics include: community-participation theory; contemporary leadership and followership theory; stakeholder collaboration; communication and conciliation strategies; the politics of diversity and inclusion; as well as

approaches taken to community and capacity building in education.

**EDADM 841.3
Administration of Special Programs
1/2(3S)**

Designed to make use of specialists from other departments. Focuses on the administration of special education programs in the schools.

**EDADM 861.3
Administration of Higher Education
1/2(3S)**

Designed to explore the administration of institutions of higher education; namely technical institutes and vocational centres, colleges and universities.

**EDADM 881.3
Organizational Paradigms and
Analysis
1/2(3S)**

Prerequisite(s): EDADM 811.

Analyzes a number of organizational paradigms based upon different sets of metatheoretical assumptions about the nature of social science and the nature of society. Emphasis will be placed on the paradigmatic shifts that are occurring in educational administration.

**EDADM 883.3
Advanced Theory of Organizational
Behaviour
1/2(3L/S)**

Prerequisite(s): EDADM 881.

An advanced review of concepts in organizational behaviour. Utilizing basic tenets of philosophical thought, it will provide in-depth examination of behavioral theories of organization and will surface related research needs and applications in the context of educational organizations.

**EDADM 884.3
Policy-making in Education: A
Critical Perspective
1/2(3S)**

An advanced doctoral level course in educational administration dealing with policy-making in education. Focuses on three main aspects of educational policy-making: building consent for educational policy; promoting deliberation, understanding, and informed action in policy-making; and synthesizing basic considerations for formulating and implementing educational policy.

**EDADM 885.3
Research Methods
1/2(3S)**

Designed to explore the various methods of research, and the problems related to research design. Special emphasis will be placed on research methods related to Educational Administration.

**EDADM 891.6/892.3
Trends and Issues in Educational
Administration
1&2(3L), 1/2(3L)**

Selected current trends and issues in educational administration will be analyzed in detail. Literature, research and related developments in other areas will be examined. These courses will normally be taught during summer sessions by visiting professors with particular expertise.

Note: May be taken more than once on the recommendation of the Department Head.

**EDADM 893.6/894.3
Advanced Laboratory in Educational
Administration
1&2(P), 1(P)**

Each provides opportunities for students to apply theory to practice in undertaking field research projects which differ from thesis and project topics. Preparation of a scholarly report and regular consultation with faculty members are key course requirements.

**EDADM 898.3
Reading Course: Individual Reading
and Study
1/2(R/T)**

Provides an opportunity for a student to pursue a topic of personal interest. The topic studied must fall outside the scope of educational administration courses offered, although this provision may be waived with the consent of the department. The student is responsible for defining the area of interest and approval of the project must be gained prior to registration. The student undertakes intensive reading under the guidance of a staff supervisor, and submits a major paper for assessment on or before a date agreed upon in writing with his/her supervisor. An oral examination is also required.

**EDADM 990
Seminar**

A required non-credit seminar for graduate students in the Master's and Ph.D. programs. Provides students with information, guidance, and some skills needed to succeed in and profit from their program of studies. Enhances skills in seminar participation, scholarly writing, library use, and computer applications. Discussions of educational issues, research opportunities, research protocols, and research funding sources are also included. Separate seminars are arranged for full- and part-time Master's students and Ph.D. students.

**EDADM 992.6
Project**

This practicum consists of either a field project or an administrative internship planned through a process of consultation among the student, an advisor, the Department Head, and an educational administrator in the field. It is designed to provide the student with a practical experience with administrative tasks and processes in education. The student is required to file a written report on the practicum with the department.

Note: Required for the project M.Ed. program; not available as an elective in the Postgraduate Diploma program.

**EDADM 994
Research**

A student undertaking research leading to a Master's thesis must register in this course each year until the thesis is completed. This applies to thesis work done extramurally as well as intramurally.

**EDADM 996
Research**

Students writing a Ph.D. thesis must register in this course.

EDUCATIONAL COMMUNICATIONS AND TECHNOLOGY

Department of Curriculum Studies, College of Education

**EDCMM 370.3
A Survey of Microcomputer Applications in Educational Environments
1/2(2L-1P)**

Emphasis is on the utilization and integration of text processing, database management, spreadsheet, and telecommunications software into classroom instruction. Computer programming skills are not required.
Note: Students with credit for CMPT 100 may not take this course for credit.

**EDCMM 402.3
Designing Multimedia and Computer-based Learning Resources
1/2(2L-1P)**

Prerequisite(s): Completion of 60 credit units at the university level.
Assists educators in the design and production of multimedia learning materials. Introduces principles of instructional design and applies them to the design and production of interactive instruction and resource materials.

**EDCMM 404.3
Distance Education: Tools and Strategies
1/2(2L-1P)**

Prerequisite(s): Completion of 60 credit units at the university level.
Examines development, organization and implementation of distance education programming for elementary and secondary schools. Distance education systems, technology, instructional development and course design are explored through presentation, demonstration and experimentation.

**EDCMM 460.3
Introduction to Educational Communications and Technology
1/2(3L)**

Prerequisite(s): Completion of 60 credit units at the university level.
Surveys the field of educational communications and technology. Topics include resource-based learning, media literacy, media utilization, distance education and instructional design. Educators learn to use media and resources to construct exciting and productive learning environments.

**EDCMM 470.3
Computer Mediated Communication
1/2(2L-1P)**

Prerequisite(s): Completion of 60 credit units at the university level.
Internet is a system that links together most of the current on-line networks around the world. Explores the informational and interpersonal resources available on the Internet network and focuses on ways that teachers can integrate these resources into classroom instruction.

**EDCMM 473.3
Producing and Using Instructional Resources
1/2(2L-1P)**

Prerequisite(s): Completion of 60 credit

units at the university.
Design, production and use of instructional resources materials for educational and training environments. Involves the study and application of principles of audio and visual communication as they apply to the development of mediated instruction.

**EDCMM 474.3
Mass Communication and Media Literacy Studies for Educators
1/2(3L)**

Prerequisite(s): Completion of 60 credit units at the university.
Explores media literacy, the language and literature of mass communication, examines how mass media influence learning, and discusses significant social, legal and educational issues such as copyright, bias and visual literacy.

**EDCMM 476.3
Introduction to Television Production
1/2(3L)**

Prerequisite(s): Completion of 60 credit units at the university.
Explores the technique of instructional television production on location and in the studio. Production experience includes single camera field production, full scale multi-camera studio production, audio mixing, graphics creation and video editing, scripting, directing, producing, editing and using television for traditional and distance education instructional formats.

**EDCMM 478.3
Still Photography in Education
1/2(3L)**

Prerequisite(s): Completion of 60 credit units at the university.
Introduces the basics of communication through still photographic and digital imagery. The student will learn to use a conventional camera, computer scanner and digital camera. Skills include film processing, print making, digitization and manipulation of still photographic and computer images for planning and developing instructional and training resources.

GRADUATE COURSES

Department of Curriculum Studies, College of Graduate Studies & Research

**EDCMM 802.6
Historical and Theoretical Foundations of Educational Technology
1&2(3L)**

Examines the historical, philosophical and theoretical foundations of the field of educational technology. Focuses on the maturation of theory and research in this area of study, and the impact of educational technology on educational institutions and practice.

**EDCMM 803.3
Principles & Practices of Authoring Interactive Instruction
1/2(3L)**

Prerequisite(s): EDCMM 370 or equivalent computer applications course.
Presents procedures and principles for planning, producing and evaluating computer-based instruction, and how to develop the necessary print-based

support materials required for its implementation.

**EDCMM 804.3
Distance Education: Theory and Practice
1/2(3L)**

The historical and theoretical foundations of distance education from a provincial, national and international perspective. Surveys the development, organization, and practice of distance education for various educational endeavours. Focuses specifically on distance education in Saskatchewan and compares the Saskatchewan situation with similar systems across Canada.

**EDCMM 873.3
Designing Materials for Individualized Instruction
1/2(3L)**

An applied course in which principles of instructional design are used to produce self-instructional materials. Students do a major project in which they plan and implement a self-instructional module in a medium of their choice.

**EDCMM 876.3
Organization and Administration of Media Centres
1/2(2L-1S)**

An examination of the operation of audiovisual programs in elementary and secondary schools and school units. The course considers the facilities, materials, equipment and services required in an audio-visual program and the budgeting, personnel and staff relations required for its operation.

**EDCMM 877.3
Advanced Cinematography in Education
1/2(2L-1S)**

Prerequisite(s): EDCMM 476; or experience and permission of the department.
Designed to allow students to continue film-making experiences encountered during EDCMM 476. The student will have the opportunity to script, direct, produce, and edit an individual medium length motion picture film. The highly individualized course gives the student wide latitude and flexibility in content, technique and production time.

Note: The student should be prepared to spend approximately \$25.00 on film stock and somewhat more time than is normally required for a 3 credit unit course.

**EDCMM 879.6
Television in Education
1&2(2L-1P)**

Prerequisite(s): EDCMM 476, or experience and permission of the department.

Investigates development of open and closed circuit television in educational institutions and integration of television into formal and informal learning situations. Development of knowledge and skills in television production, direction and script writing will be stressed in practical laboratory situation. Students will undertake major projects simulating those now utilized in educational TV.

**EDCMM 898.3
Special Topics**

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

EDUCATIONAL FOUNDATIONS

Department of Educational Foundations, College of Education

**EDFDT 101.3
Introduction to Education
1/2(3L)**

Prerequisite(s): Admission to the College of Education.
Lays foundations for the study of education and pedagogy. The equity component presents a moral basis for questioning personal attitudes and public practices concerning race, gender, exceptionalities, and class. The epistemological component provides a context for understanding the learning process and curriculum development.

**EDFDT 335.3
First Nations and Cross-Cultural Education: An Introduction
1&2(3L)**

Prerequisite(s) or Corequisite(s): EDFDT 101 and 3 credit units in Native Studies or permission of the department.
Analyzes educational issues of a politically, economically, and culturally diverse society. Theory and practice of cross-cultural, multicultural and anti-racist education from the perspectives of First Nations/Metis, immigrant and ethnic minorities are evaluated. The ideological and philosophical premises of these approaches are considered. The role and responsibility of educators in ensuring equity and promoting cross-cultural understanding are examined.

All 400-level courses require the successful completion of EDFDT 101. In cases where prerequisites cannot be met, students must request special permission from the Department Head.

**EDFDT 420.3
Origins and Growth of Canadian Education
1/2(3L)**

Prerequisite(s) or Corequisite(s): EDFDT 335.
Historical examination of the development of Canadian education and its relationship to social, economic, political, and cultural developments.

**EDFDT 432.3
Philosophy of the Curriculum
1/2(3L) IS/SS**

Prerequisite(s): Completion of 60 credit units at the university.
Students will explore the extent to which political, economic, and social factors influence school curriculum. They will acquire tools of argument for justifying curriculum proposals and examine the process by which recent curriculum in Saskatchewan has been developed.

**EDFDT 435.3
Educational Thought and Values:
Critical Perspectives
3(3L)**

Prerequisite(s): EX PR 402.
Explores the normative dimensions of teaching including the purposes of schooling, the capacities of an educated person, the scope of moral education, the valued characteristics of good teachers, and value issues related to different kinds of teaching and the content of what is to be learned.

**EDFDT 436.3
Rationale, Theory and Practice of
Co-operative Learning
1/2(3L)**

Prerequisite(s) or Corequisite(s): EDFDT 335.
Examines current school practices and foundations of co-operative learning. Focuses on philosophical, historical, cultural and sociological analysis of competition, individualism, and co-operation in schools and examines societal implications of these notions, with particular reference to the workplace.
Note: Offered yearly in Spring and Summer Session.

**EDFDT 440.3
An Introduction to Sociology of
Education
1/2(3L)**

Prerequisite(s): EDFDT 101 or permission of the department.
Examines schooling and the education system from the perspective of sociological theories. Social factors will be discussed critically in light of gender, race, class and sexuality. Emphasis is on the role of the teacher in today's society.

**EDFDT 454.3
International Education Study Tour**

Prerequisite: Completion of 60 credit units at the university level.
Students are introduced to the culture of the designated country and the history and structure of its education system through pre-departure readings and seminars. While on tour, students will analyze the relationships between cultural tradition, economic and political structures, and education through visits, attending seminars, and recording observations in journals.
Note: Offered Summer Session 1999-2000.

**EDFDT 480.3
Educating for a Global Society
1/2(3L)**

Prerequisite(s): EX PR 402 or permission of the department.
Focuses on intercultural and international relationships in education with an emphasis on the growing independence brought about by a global culture. Topics include development education, ecological education, human rights education and peace education.

**EDFDT 481.3
Education and the Environment
1/2(3L)**

Prerequisite(s): EDFDT 101 or permission of the department.
Prepares students to integrate environmental concerns into their teaching. Environmental education's history is traced

and its theories explored. Issues involved in providing environmental education in schools are discussed.

**EDFDT 482.3
Women and Education
1/2(3L)**

Prerequisite(s): EDFDT 101 or permission of the department.
Using an interdisciplinary approach, explores the social institutions and practices which contribute to and reinforce gendered identities: family, church, state, schools and popular culture. A limited historical overview of the education of females in the Canadian context is provided. Feminist critiques of formal education are studied.

**EDFDT 483.3
Women and the Teaching Profession
1/2(3L)**

Prerequisite(s): EDFDT 101 or permission of the department.
Traces women's relation to the occupation of teaching in Canada as it developed and changed over time, and as it is currently. Topics include the historical evolution of teaching, feminization and professionalization, unionization, and women teacher's entry into administrative positions and institutions of higher education.

**EDFDT 486.3
Gay and Lesbian Issues in Education
1/2(3L)**

Prerequisite(s): Completion of 60 credit units at the university.
Focuses on the political, psychological, and ethical issues surrounding gay and lesbian students and teachers, inclusiveness of the curriculum, resource-centre policy, homophobia in the school setting and dilemmas faced by school counsellors.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

EDFDT 298.3 1/2(3S)

EDFDT 498.3 1/2(3S)

EDFDT 499.6 1&2(3S)

GRADUATE COURSES

Department of Educational Foundations,
College of Graduate Studies & Research

**EDFDT 820.3
Early Educational Classics
1/2(3S)**

Selected educational classics from antiquity to 1850 in the light of the contributions they have made to educational theory and practice.

**EDFDT 821.3
Modern Educational Classics
1/2(3S)**

Selected educational classics from 1850 to the present in the light of the contributions they have made to educational theory and practice.

**EDFDT 822.3
Seminar in History of Canadian
Education
1/2(3S)**

Selected topics in Canadian educational history since 1867.

**EDFDT 823.3
Education and Canadian Minorities
1/2(3S)**

The history of education of selected Canadian minority groups.

**EDFDT 830.3
Philosophy of Education: Methods of
Investigation
1/2(3S)**

An introduction to basic methods of engaging in philosophy of education focusing on such modes as conceptual analysis, phenomenology, existentialism, critical theory, and pragmatism.

**EDFDT 831.3
Existentialism and Education
1/2(3S)**

Highlights critical issues raised by existentialists which in turn serve as the starting point for thinking about the individual and education.

**EDFDT 832.3
Phenomenology and Education
1/2(3S)**

Inquiry into the value for education of phenomenological theory and methodship. Major works of selected phenomenologies will be examined.

**EDFDT 833.3
Conceptual Analysis and Education
1/2(3S)**

An analysis of educational concepts using the techniques of modern conceptual analysis to illuminate ethical, epistemological and other educational problems.

**EDFDT 835.3
Problems in Philosophy and
Education
1/2(3S)**

Topics selected by the instructor and students.

**EDFDT 836.3
Contemporary Education in Theory
and Practice
1/2(3S)**

A critical analysis of contemporary educational practice in the light of recent literature on educational theory.

**EDFDT 837.3
Educational Philosophies and the
Curriculum
1/2(3S)**

Deals with the philosophical foundations of curriculum theory and will clarify the basis from which educational programs can be analysed. Contemporary philosophical issues related to the curriculum and school programs will be examined. The writings of selected educational philosophers will be studied.

**EDFDT 840.3
Research Design in Sociology of
Education
1/2(3S)**

Prerequisite(s): EDRES 800.
Gives students the opportunity to apply research methods to specific problems in

sociology of education. Whenever possible, students will participate in ongoing research in the department.

**EDFDT 841.3
Sociological Theories of Education
1/2(3S)**

Prerequisite(s): EDFDT 440; or permission of the department.
Examines the contributions made by functionalism, conflict theory, and interactionism to educational theories. Furthermore, the status of the 'new' sociology of education will be critically assessed.

**EDFDT 850.3
Comparative Studies in Education
1/2(3S)**

Prerequisite(s): Permission of the department.
Focuses on methodological issues in comparative education and introduce the student to landmarks in cross-national research.

**EDFDT 851.3
International Education and
Modernization
1/2(3S)**

Focuses on educational issues in development and modernization, and the role of education in international understanding and cooperation.

**EDFDT 854.3
International Education Study Tour**

Predeparture readings and seminars will introduce students to the culture of the designated country and to the history and structure of its education system. Lectures, seminars, observation, and journals will be used to develop an analysis of the relationships between cultural tradition, economic and political structures, and education.

**EDFDT 860.3
Seminar in Anthropology and
Education
1/2(3S)**

Investigation of selected problems in anthropology and education.

**EDFDT 870.3
Interdisciplinary Seminar in
Foundations of Education
1/2(3S)**

A consideration of important educational issues from the anthropological, comparative, historical, philosophical and sociological points of view and the possible implications for a comprehensive theory of education.

**EDFDT 871.3
Student Seminar
1/2(3S)**

Under appropriate faculty supervision, students will assume major responsibility for initiating and developing the content and form of the course.

**EDFDT 872.3
The Experience of Women in
Canadian Education
1/2(3S)**

Prerequisite(s): EDFDT 482 and 483; or their equivalents.
Provides a philosophical analysis of the conceptualization of the position of women in traditional educational theory and traces historically the provision of education for

women in Canada. A sociological analysis of the school is undertaken to determine the extent to which it may be contributing to sexist attitudes and practices. Special attention is paid to the education of Saskatchewan native women.

**EDFDT 873.3
Feminist Thought and Its
Implications for Canadian Education
1/2(3S)**

Prerequisite(s): EDFDT 872.
A theoretical, feminist framework is developed in order to analyze research, theory and practice in Canadian education. Feminist thought and its implications for education are analyzed philosophically. A feminist critique of the basis of women's socio-economic position in Canadian society is developed both historically and sociologically. Feminist thought as a mode of analysis is used to make a comparative study of women and education in selected countries.

**EDFDT 881.3
Education, Wisdom and Nature
1(3S)**

Traces the concept of wisdom from earliest times through a decline in interest during the Enlightenment to its present-day resurgence among feminist theologians, deep ecologists, and First Nations peoples. Conceptions of wisdom and their emotional and cognitive preconditions are explored. Educational implications are considered.

**EDFDT 882.3
Education and Moral Development
1/2(3S)**

Prerequisite(s): PHIL 230 or 233; or equivalent.
The theoretical aspects of moral education. The possibility of reasoning morally, the case for the developmental hypothesis, the cultivation of moral sentiments, the role of conscience in moral experience and the fostering of moral character are the major areas investigated.

**EDFDT 883.3
Moral Education in Practice
1/2(2S-1P)**

An introduction to a variety of materials and strategies used for the purposes of moral education and apply these in simulated classroom and school settings.

**EDFDT 898.3/899.6
Individual Reading in Educational
Foundations
1/2(3R), 1&2(3R)**

Provides students with an opportunity to study in areas of their own interest. Under the direction of a staff advisor, they plan and follow a reading program and prepare a major paper.

Note: Students may take up to 12 credit units of individual reading in their graduate program.

**EDFDT 990
Seminar**

This is a non-credit seminar designed for students in residence. Students and faculty explore issues in the general field of educational foundations using literature that is both challenging and current.

**EDFDT 992.6
Project**

A compulsory course for those registered for the project Master's route. The project must be accepted by a committee of the department and evaluated by the committee plus an external member.

**EDFDT 994
Research**

Students undertaking research leading to a Master's thesis must register in this course each year until the thesis is completed (applies to thesis work done extramurally as well as intramurally).

**EDUCATIONAL PSYCHOLOGY AND
SPECIAL EDUCATION**

Department of Educational Psychology and Special Education, College of Education

**EDPSE 258.3
Learners and Learning (Formerly
EDPSY 258.3)
1/2(3L)**

Prerequisite(s): EDFDT 101 (or corequisite for Sequential Program students)
Assists students to develop an understanding of the characteristics of learners and the learning process in childhood and adolescence, and provides a foundation for meeting the learning needs of students through a variety of teaching-learning models and instructional strategies.

**EDPSE 390.3 (Formerly EDEXC 390.3)
Exceptional Learners
1/2(3L)**

Prerequisite(s) or Corequisite(s): EDPSE 258.
Introduces students to the concept of exceptionality as it reflects the special needs of individuals for whom they will be responsible in their classrooms, schools, and communities. The philosophy of inclusion will be emphasized. Students will learn how to identify and provide appropriate learning opportunities for children with special needs and ensure that they receive additional services to which they are entitled by the Saskatchewan Education Act and current Regulations. Students will become sensitive to cultural differences, the need to work with families and the importance of early intervention to prevent or ameliorate disability.

**EDPSE 410.3 (Formerly EDEXC 410.3)
Language and Communication
Disorders in the Classroom
1/2(3L)**

Prerequisite(s): EDPSE 390.
Language and communication development and disorders will be studied with emphasis on the impact they have on students' academic, social, emotional and cognitive development. The teacher's role, including classroom identification and assistance for students having language and communication disorders, will be discussed. Classroom and instruction modifications will be presented.

**EDPSE 414.3 (Formerly EDEXC 414.3)
Exceptional Learners: Classroom
Implications
1&2(3L)**

Prerequisite(s): EDPSE 390.
Emphasizes strategies and techniques

useful in accommodating children and youth with special learning needs in the regular classroom. Students will learn how to maximize potential for individualization through procedures such as adapting lesson plans, devising alternative evaluation procedures and modifying teaching techniques and materials.

**EDPSE 415.3 (Formerly EDPSY
415.3)
Interpersonal Communication and
Personal Development
3(3L-1P))**

Prerequisite(s): EX PR 402.
Topics include: psychosocial well-being and its social and cultural dimensions, interpersonal, intergroup and intercultural communication, group processes, the management of stress, and conflict resolution. Class activities foster professional and personal development, and help students to acquire strategies and skills applicable to diverse classroom, professional, and community contexts.

**EDPSE 416.3 (Formerly EDPSY 411.3
and EDPSY 425.3)
Comprehensive Guidance and
Counselling
1/2(3L)**

Prerequisite(s): 3 credit units in Educational Psychology or permission of the instructor
Introduction to comprehensive guidance and counselling in school, community, and agency settings. Examines the rationale for and best practices, as well as roles, functions, and ethical practices of personnel involved in guidance and counselling, career education, work education, career resource centres, academic advisement, and student recruitment centres.

Note: Students may not obtain credit for both this course and EDPSY 411.3 or EDPSY 425.3

**EDPSE 417.3 (Formerly EDPSY 412.3)
Introduction to Counselling
2(3L)**

Prerequisite(s): EDPSE 416.3 or permission of the instructor.
Introduces students to major contemporary theories and practices of individual and group counselling. The primary focus is on preparing classroom teachers and school counsellors for conducting school counselling activities. This is a prerequisite class for the graduate program in counselling in the Department of Educational Psychology and Special Education.

Note: Students may not receive credit for both this course and PSY 257 in a B.Ed. program.

**EDPSE 418.3
Special Topics in Educational
Psychology and Special Education
1/2(3L)**

Prerequisite(s): Permission of the Instructor
Reviews the theoretical and practical bases of emerging trends in educational psychology and special education. Regular faculty with specific expertise or visiting scholars will offer the course periodically.

**EDPSE 421.3 Assessing the Needs of
Diverse Learners
1(3L)**

Prerequisite(s) or Corequisite(s): Student must hold a B.Ed. degree and have completed EDPSE 390, 410, and 414.
Provides theoretical background and practical assessment skills for delivery of effective educational programs for students with special needs. Emphasis is placed on the "why, who, when, where, and how" working within the collaborative team to design the assessment plan, gather information, plan and implement services, and monitor student progress.

**EDPSE 422.3 Program Planning for
Exceptional Learners
1(3L)**

Prerequisite(s) or Corequisite(s): EDPSE 421 or approval of the department.
The intent of this class is to provide preparation in the theory of instructional methods and strategies of known to be effective of "best practice" instruction in Special Education. The emphasis in this class is on the organizational and procedural aspects of instruction and is directed toward providing frameworks for instructional decision-making in a variety of instructional environments.

**EDPSE 437.3 (Formerly EDPSY 437.3)
Classroom Dynamics and Student
Discipline
1(3L)**

Corequisite(s): EX PR 402 or permission of the department.
Classroom and student discipline are examined from a holistic perspective. Prospective teachers explore and apply to situations encountered in the internship a variety of models for conceptualizing classroom dynamics and constructing interventions which facilitate student self-regulation in diverse educational and socio-cultural settings.

**EDPSE 441.3 (Formerly EDPSY 441.3)
Introductory Statistics in Education
1/2(3L)**

Prerequisite(s): 3 credit units in Educational Psychology or permission of the instructor.
Provides the student with an overview of descriptive statistics and basic psychometric concepts, with specific attention to problems of measurement and research in education and counselling. The emphasis is on application rather than derivation. No specific mathematical background is required.

Note: Especially recommended for students needing to fulfill the statistics requirement for admission to M.Ed. programs. Students with credit for COMM 104, PSY 233 or STATS 244 may not take this course for credit.

**EDPSE 448.3 (Formerly EDPSY 448.3)
Assessing Learning in the Classroom
2(3L)**

Prerequisite(s): 3 credit units in Educational Psychology or permission of the instructor.
Provides training in the skills involved in assessing student achievement. Students will learn how to construct various measuring devices such as paper and

pencil tests, performance tests, assignments, portfolios, and observation schedules. Students will also learn how to summarize, interpret and report assessment results.

EDPSE 453.3 (Formerly EDPSY 453.3) Human Development: Adult 1/2(3L)

Prerequisite(s): EDPSE 258 or permission of the department.

Examines social roles, concerns, learning characteristics and self-concepts of men and women at different stages of the adult life cycle. Various aspects of adult life and roles will be selected for more intensive study, depending on the specific interests of students.

EDPSE 455.3 (Formerly EDPSY 492.3) Issues of Adolescence 1/2(3L)

Prerequisite(s): EDPSE 258 or permission of the department.

Typical and atypical developmental concerns and issues of adolescence are examined from the perspective of the classroom teacher. Special attention is given to Canadian research, community contexts, and resources; and to the impact of gender, cultural, socio-economic, and school factors on identity formation, academic performance, psychological health, and life chances.

Note: Students with credit for Psy 214.3 may not take this course for credit.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

EDPSE 498.3 1/2(3S)

GRADUATE COURSES

Department of Educational Psychology and Special Education, College of Graduate Studies & Research

See also EDEXC courses listed under Educaiton - Special Education.

EDPSY 811.3 The Organization and Administration of the Guidance Program 1/2(3L-1S)

A seminar dealing with the organization of the school guidance program; its relation to the total school organization, the counselor as program administrator; guidance in relation to the curriculum and needs of society; the counselling program and staff relationships.

EDPSY 812.3 Theories of Counselling and Psychotherapy 1(3L)

Historical overview of the major schools of counselling and psychotherapy and considers these within the framework of a constructive-developmental orientation. Representative theories within each school are examined in terms of their philosophical roots and their impact upon contemporary therapeutic models and approaches. Emphasis is placed upon meeting the counselling needs of individuals in education/school contexts.

Students are encouraged to develop an integrated personal theory of counselling and to adopt a reflective practitioner orientation to the provision of counselling services.

EDPSY 813.3 Counselling: Therapeutic Approaches and Techniques 2(1L-1S-1P)

Prerequisite(s): EDPSY 812; or permission of department.

Introduces students to specific therapeutic approaches and techniques of counselling children, adolescents, and adults and provides a theoretical foundation for the practice of a variety of counselling skills. Particular emphasis is placed upon meeting the counselling needs of individuals in educational/school contexts. Students are encouraged to continue to move in the direction of developing an integrated personal theory of counselling and to adopt a reflective practitioner orientation to the provision of counselling services.

EDPSY 814.3 Group Counselling 1/2(1S-2P)

Students are provided with an opportunity to develop an understanding of group interaction, dynamics, and interpersonal relationships, through active involvement in a group experience designed to enhance participants' self-awareness and self-insight. These understandings are reinforced by an examination of group theory and processes, with special attention to group counselling in the context of the internship and extended practicum in the Counselling program.

EDPSY 815.3 Child Counselling 1/2(1L-2S)

Familiarizes students with the depth study method, identification of vulnerable children, children's rights, and services available for children. Intervention strategies considered include environmental approaches and classroom management; consultation with parents, teachers and other agencies; and individual and group counselling with children. A practical component is built into the course.

EDPSY 816.3 Family Counselling 1/2(1L-2P)

Provides an orientation to the counselling of family units and related services available to the community. Techniques of family counselling are demonstrated, and discussed. A practical component for the practice of specific skills is built into the course. Problems are examined within a systemic context which includes the interactions between families and the school system.

EDPSY 819.6 Practicum in Educational Psychology 1&2(4S-4P-4C)

Provides a supervised practical experience in counselling/school psychology/measurement and evaluation. The primary objective is to facilitate the development of appropriate skills in the designated area. The practicum is divided into three major segments: a three month pre-practicum during September to December; a four month practicum during

December through April; and a two month full-time practicum during May and June.

EDPSY 825.3 An Advanced Seminar on Career Education 1/2(1L-1S-1P)

An opportunity for students to examine in depth, integrate, and apply theories, principles, and interventions relevant to career development. Students will critically analyze and evaluate a variety of interventions, including career education, work experience, workshops and support groups for focus populations (e.g., youth, midlife career changers, minority groups, women, persons with disabilities, retirees), employee assistance programs, etc. The goal is for students to develop competencies in selecting, creating, implementing, and evaluating career interventions.

EDPSY 827.3 Career Counselling: Theory 1(3S)

Based on the concept of career as a dynamic, holistic, life-long enterprise. Students examine the theoretical, research, assessment and practice literature related to career development as well as individual and group career counselling.

EDPSY 829.3 Career Counselling: Practicum 2(3P)

Prerequisite(s): EDPSY 827.

Emphasizes the application of the theoretical, research, assessment and practice literature related to career development and career counselling in a variety of settings (elementary, middle years, senior high school, post-secondary school, adult counselling centres, etc.). Students will work with a limited number of clients.

EDPSY 831.3 Theory and Practice of School and Applied Psychology 1(1L-1S-1P)

Focuses on the conceptual, theoretical and applied framework of school psychology; service roles in diagnosis, treatment, prevention and consultation; ethics and professionalism; and a survey of the research literature on special populations of students. It is intended to introduce students to the field of school and applied psychology.

EDPSY 832.3 Theory and Methods of Behaviour Analysis and Therapy 1/2(1L-2P)

Designed specifically for graduate students who intend to work in educational and education-related health settings, this course examines the principles and practices of behavioral analysis and therapy. A major focus will be on the application of behavioral strategies to the needs and problems of individuals and groups in school, family, and community environments.

EDPSY 835.3 Assessment in Educational Psychology: Introduction 1(2L-1P)

Introduces the theory and practices of psychological and educational assessment, including the history of assessment,

techniques of assessment, theory of test construction, psychometric properties of tests, case management from referral through intervention, collaborative consultation, report writing and ethics. Practice includes screening in the academic, cognitive and behavioural domains.

EDPSY 836.3 Assessment in Educational Psychology: Intermediate 2(2L-1P)

Prerequisite(s): EDPSY 835

Consists of the theory and practice of cognitive, social, emotional and behavioural assessment. Students administer and interpret assessment batteries consisting of interviews, behavioral observation and individual tests of cognition and personality, with provision for the inclusion of some measures of specific interest for students.

EDPSY 837.3 Advanced Clinical Assessment in Educational Psychology 1/2(1L-1P)

Prerequisite(s): EDPSY 835, 836 and permission of the instructor.

Designed for doctoral and advanced masters level students, this course includes cognitive, neurological, social, behavioural, and personality assessment for the purpose of conceptualizing and evaluating interventions. Students review current research literature, construct integrated batteries, and assess the functioning of clients with a variety of disorders.

EDPSY 843.3 Theory of Educational and Psychological Measurement 1(1L-1S-1P)

A theoretical examination of the basic problems of psychological measurement, together with the statistical procedures relevant to the understanding and evaluation of tests. Both classical test theories and item response theory models are examined.

EDPSY 844.3 Advanced Test Theory and Instrument Construction 2(1L-2P)

Prerequisite(s): EDPSY 843.

A detailed examination of test theory within an instrument development context. Both classical test and item response theories are examined from the perspective of designing various measuring instruments. Educational and psychological tests, questionnaires, interview schedules, and program evaluation instruments are among the information gathering devices which may be considered depending upon the professional interests and needs of the students. A practical skill development component is built in.

EDPSY 851.3 Advanced Educational Psychology: Human Development and Personality 1/2(2L-1S)

Examines various theoretical perspectives and research in the areas of human development and personality with a view to assisting students in the Educational Psychology sub-specialities to identify and

meet the needs of clients in a variety of educational settings.

**EDPSY 855.3
Advanced Educational Psychology:
Learning
1/2(2L-1S)**

The major approaches to the study of human learning are examined from the points of view of theory, research, and application. Students are encouraged to critique research in the field of human learning and to relate current findings to educational situations such as counselling, teaching, program design, and curriculum development.

**EDPSY 881.3
Group Processes and Communication
1/2(3S)**

Prerequisite(s): Permission of the instructor.
Designed to facilitate personal learning in interpersonal relations and small group functioning. The development of both conceptual frameworks and behavioral skills will be stressed. Emphasis will be placed on the experiential approach to learning with video taped feedback being available. A variety of time blocks will be employed which will include lectures, weekend workshops and individual consultation with the instructor.

**EDPSY 884.6
Adult Counseling in Continuing
Education**

Prerequisite(s): Consultation with the instructor.
Theories and techniques of personal and group counseling in work with adults. Opportunity to observe professional counselors, and to obtain experience in counseling under skilled supervision.

**EDPSY 898.3/899.6
Special Problems in Educational
Psychology: Reading Course
1/2(3R), 1&2(3R)**

Topics for individual study are selected by the student in consultation with a faculty advisor. The study may take the form of an extensive report or a project which is both accepted and evaluated by a committee of three. A copy of the final project must be left with the Department Head. The area must be one which is not covered by an existing course. Permission of the Department Head is required.

**EDPSY 990
Seminar**

A non-credit course for graduate students in residence. Current issues in educational psychology will be discussed. It will also provide a forum for discussing current faculty and student research.

**EDPSY 992.6
Project**

For students registered in a non-thesis Master's degree. It is a compulsory course for the non-thesis Master's route. The project must be accepted by a committee of the department and evaluated by the committee plus an external member.

**EDPSY 994
Research**

A student undertaking research leading to a Master's thesis must register in this course each year until the thesis is completed

(applies to thesis work done extramurally as well as intramurally).

INDIAN AND NORTHERN EDUCATION

Department of Curriculum Studies, College of Education

**EDIND 220.6
Advanced Oral and Written Cree for
Teachers
1&2(3L)**

Prerequisite(s): CREE 120 or permission of the department.

Presents the development of oral and written Cree language. Standard Roman Orthography will be used to compose original writings such as poetry, verse, changes, legends and stories. Elders and traditional storytellers will be a main resource.

Note: Students who are non-Cree speakers who have completed CREE 101 and 120 will have acquired the appropriate oral and written proficiency for this class. **This is an External course.**

**EDIND 360.3 Aboriginal Education in
a Cross-Cultural Context
1/2(3L)**

Prerequisite(s) or Corequisite(s): EDFDT 335.

Offers a cross-cultural contextual framework for addressing the education of Aboriginal students within school system. It focuses on the ideological foundations of traditional Aboriginality and modern schooling, the educational implications for meeting the needs of Aboriginal students, and the creation and adaptation of cross-cultural appropriate pedagogy and curriculum.

**EDIND 375.3
Teaching English as a Second
Language/Dialect: Level One
1/2(2L-1P)**

Designed for teachers who are employed to teach English as second language/dialect to Indian and native students. Emphasis is on methods appropriate for coping with the linguistic difficulties encountered in school by children whose first language is one spoken by Aboriginal peoples.

**EDIND 380.3
Incorporating the Cultural Arts of
Indian, Métis and Inuit People into
School Programs
1/2(3L)**

Informs students about the rich and varied cultural arts of the Indian, Métis and Inuit people of North America. Emphasizes understanding and aesthetic appreciation as well as on practical aspects of cultural arts inclusion in school programs.

**EDIND 450.3
Aboriginal Epistemology and
Pedagogy
1/2(3L)**

Prerequisite or Corequisite: EDFDT 335.3

This course features salient Aboriginal learning styles and teaching strategies which underpin the survival and resiliency of Aboriginal people. It provides an opportunity through seminar, collaborative investigations and critical exploration to analyse Aboriginal ways of knowing and an art of teaching respecting Aboriginal protocols and knowledge.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

EDIND 498.3 1/2(3S)

GRADUATE COURSES

Department of Curriculum Studies, College of Graduate Studies & Research

**EDIND 800.3
History of Indian and Native Education
in Central and Atlantic Canada
1/2(3L)**

The nature of history as it pertains to Indian and Inuit people. Describes and analyzes the chronological development of schooling for the indigenous people in Central and Atlantic Canada. Historical origins of contemporary issues in education are examined.

**EDIND 810.3
History of Indian and Native Education
in Western and Northern Canada
1/2(3L)**

A review and examination of educational practices of Indian and Inuit people of Western and Northern Canada both before and after the arrival of Europeans. The course outlines the involvement in schooling of the Hudson's Bay Company, missionaries and governments. Contemporary developments in education for Indian, Métis and Inuit people are discussed.

**EDIND 820.3
Administrative Systems of Indian and
Northern Education
1/2(3S)**

Examines the various administrative systems and structures through which schooling is offered to Indian, Métis and Inuit people. Systems of concern include the Department of Indian and Northern Affairs, Governments of the Yukon and Northwest Territories, the Department of Northern Saskatchewan, provincial and band controlled school boards and committees. Legal, financial and jurisdictional aspects of the structures are discussed.

**EDIND 825.3
Role of the Administrator in Indian
and Northern Education
1/2(3S)**

A study of the duties, responsibilities and leadership qualities required of a school administrator in the various structures within which schooling is available to Indian, Inuit and Métis people. Changing expectations of local people (i.e. band controlled schools) and the role of the school principal are examined.

**EDIND 830.3
The Environment of the Schooling
Process for Indian and Native
Students in Northern Areas
1/2(3S)**

Focuses on the educational environment of Indian, Métis and Inuit students with emphasis on cultural, political, economic change in northern and isolated communities. Data is drawn from ethnography and other anthropological research.

EDIND 840.3

**The Environment of the Schooling
Process for Indian and Native Students
in Integrated and Urban Systems
1/2(3S)**

A seminar centering on the societal environment of the schooling process experienced by Indian and native students in small integrated schools and those in large urban centres. Implications of economics, housing, politics, mobility, teaching/learning approaches and curriculum are discussed.

**EDIND 845.3
Cross-Cultural Communication in
Theory and Practice
1/2(2L-1P)**

A study of the theories of interpersonal communication and of the barriers posed by variables within the cultural learnings of speaker and listener. Explores the use of role-plays, simulations and cross-cultural interaction to increase understanding and communication effectiveness.

**EDIND 850.3
Cross-Cultural Psychological
Research and Its Implications for
Teaching Indian, Métis and Inuit
Students
1/2(3S)**

An examination of the development of the field of cross-cultural research in psychology and the importance of findings to the design of teaching material and techniques. Examines the problems and ethics involved in conducting cross-cultural studies as well as the applicability of research conclusions across cultures.

**EDIND 851.3
Decolonizing Aboriginal Education
1(3S)**

This course is intended to address colonization and imperialism among Aboriginal peoples, focusing specifically on the role education has played in achieving cognitive imperialism, critique the tenets of cognitive imperialism in English language and education policy, politics, and practice, and evaluate international options for restoring Aboriginal communities.

**EDIND 855.3
Cross-Cultural Research
Methodology
1/2(2L-1P)**

A methodology course dealing with the adaptation of various research approaches to the study of variables across cultures. Students are expected to become involved in the design and conduct of a cross-cultural research study.

**EDIND 860.3
Cross-Cultural Education Within
Circumpolar Countries
1/2(3S)**

A survey of systems, programs, teaching approaches and the development of curriculum materials for the education of minority groups resident in circumpolar countries and areas. The focus is on Greenland, the Scandinavian countries, northern Russia, Alaska and northern Canada

EDIND 865.3
Use of Media as an Aid to
Cross-Cultural Communication
1/2(1L-2P)

An activity-oriented course concerned with a study of the use and impact of mass media on communication across cultures. Opportunity will be provided for students to become familiar with producing audio-visual material for use in cross-cultural teaching situations..

EDIND 870.3
Cross-Cultural Education Within
Third World Countries
1/2(3S)

A survey of the development of schooling for indigenous and minority cultures within a sample of third world countries. Focus will be on the aborigines of Australia, the Maoris of New Zealand, the Indians of Latin and South America, and the original people of African countries.

EDIND 898.3/899.6
Special Study - Individual Reading
Course
1/2(R), 1&2(R)

Students select a specific area of interest within the field of Indian and Northern education. In consultation with a faculty advisor the student delineates the subject of study, research methodology, bibliography and working arrangements. A completed report or mini-project is evaluated by a committee of faculty within the Program in consultation with the student.

EDIND 992.6
Project

A compulsory course for those registered for the project Master's route. The project must be accepted by a committee of the department and evaluated by the committee plus an external member.

EDIND 994
Research

A student undertaking research leading to a Master's thesis must register in this course each year until the thesis is completed. This applies to thesis work done extramurally as well as intramurally.

MUSIC EDUCATION

College of Education

Students in the College of Arts & Science may take some EDMUS courses for credit towards a B.A. or B.Sc. degree. For details see the College of Arts & Science section.

EDMUS 102.3
School Vocal Techniques
1/2(3L)

Intended for students with limited voice training, or students other than voice majors. A group approach to human voice as a musical instrument stressing the fundamental principles involved in developing good vocal technique.

EDMUS 270.3
Classroom Guitar Techniques
1/2(3L)

Designed for teachers who plan to use the guitar as a vehicle for teaching music concepts and skills at the elementary or secondary level. Teaching methods and materials include a review of audiovisual and other materials, teaching and

motivational strategies, classroom routines and evaluation strategies.

EDMUS 303.3 Teaching Music in
Elementary/Middle Schools
1/2(3L)

Prerequisite(s): EDCUR 200.

Introduces students to elementary/middle years music methods and develops many of the basic skills required to teach music in the elementary/middle years school. Is intended for elementary/middle years students without a background in music.

Note: Students may receive credit for only one of EDMUS 300 and 303.

EDMUS 327.3 (Formerly 240)
European Methods in Music
Education (3L)

Prerequisite(s): MUSIC 101 or 113 and 114; or permission of the department.

A first course in European approaches to music education such as Kodály or Orff with special emphasis on music reading techniques. Laboratory participation constitutes an important phase of the course.

EDMUS 328.3 Pre-School and
Primary Music Methods
1/2(3L)

Prerequisite(s): MUSIC 101 or permission of the department.

Focuses on music programs for nursery school, kindergarten, and primary grades. Designed to offer classroom teachers and music specialists an understanding of the methods, materials, and techniques for teaching music at the primary level.

EDMUS 331.3
Introduction to Elementary School
Music Methods
1/2(3L)

Prerequisite(s): MUSIC 113 and 119, and EDCUR 200.3; or equivalent study of harmony, or permission of the department.

An Introduction to the study of school music methods and materials essential for the sequential development of the musical learning process of elementary school students. Studies include psychological principles of child growth and development as applied to the music learning process. This course is intended for

Elementary/Middle Years Music Specialists in the combined B.Ed./B.Mus.(Mus.Ed.) program and College of Education students electing music as a Teaching Area.

Note: A background in music (a 30-level high school music credit, Grade VIII Royal Conservatory or permission of the department) is required.

EDMUS 332.3
Advanced Elementary School Music
Methods
1/2(3L)

Prerequisite(s): EDMUS 331 or permission of the department.

A study of advanced school music methods and materials essential for the sequential development of the musical learning process of elementary school students. The course will explore in greater depth the methodology of Orff, Kodaly and others. The development and design of instructional programs with respect to the

teaching process, including other materials of music education will be studied.

EDMUS 335.3
Introduction to Conducting
1(3L)

See new course MUSIC 325.3.

EDMUS 336.3
Intermediate Conducting
2(3L)

See new course MUSIC 326.3

EDMUS 337.3
Jazz Ensemble Techniques
1/2(3L)

Prerequisite(s): MUSIC 213 and 214 or permission of the department.

An introduction to the study and application of techniques in reading jazz, teaching, improvisation, jazz ensemble rehearsal, and the management of the successful school jazz ensemble program. Other areas of study include: the rhythm section, literature selection, score analysis and preparation, basic jazz theory, and the use of technology in jazz education.

EDMUS 338.3
Classroom Instruments
1/2(3L)

Prerequisite(s): MUSIC 113 and 114 or equivalent study of harmony or MUSIC 101 or permission of the department.

Deals with methods and techniques involved in playing and teaching classroom instruments including ukulele, guitar, recorder and mallet percussion.

EDMUS 340.3
Teaching Instrumental Music in the
Secondary School
2(3L)

Prerequisite(s): MUSIC 113 and 114 or permission of the department.

A study of instrumental materials and methods including curricula and support materials, standards planning, teaching strategies, technology, evaluation, and future directions in music education. Students are required to apply course learnings in lesson and rehearsal planning and to conduct research using a variety of resources.

EDMUS 342.3
Philosophical Basis of Music Education
1(3L)

Prerequisite(s): MUSIC 113 and 114 or permission of the department.

An introduction to the philosophical, psychological and curricular foundations of music education.

EDMUS 427.3 (Formerly 328)
Advanced European Methods in Music
Education
(3L)

Prerequisite(s): EDMUS 327 or permission of the department.

An advanced course in European methods such as Kodály and Orff. The coordinated vocal/instrumental approach to music education will be stressed. Laboratory participation constitutes an important phase of the course.

EDMUS 428.3
Choral Techniques
1/2(3L)

Prerequisite(s): MUSIC 213 and 214 or

permission of the department.

A course dealing with the fundamentals of leading a choir. Topics include: review of conducting skills, vocal technique, text and diction, choral tone, selection of repertoire and rehearsal skills, style and performance practice.

EDMUS 430.6
Woodwind Techniques
1&2(3L)

Prerequisite(s): MUSIC 113 and 114 or permission of the department.

An intensive study of playing and teaching techniques of woodwind instruments, including equipment and materials. Special topics in elementary and secondary school woodwind pedagogy are also included.

EDMUS 433.3
Brass Techniques I
1/2(3L)

Prerequisite(s): MUSIC 113 and 114 or permission of the department.

Trumpet and euphonium pedagogy and performance skills for music educators.

EDMUS 434.6
String Techniques
1&2(3L)

Prerequisite(s): MUSIC 113, 114 and 140 or permission of the department.

An intensive study of playing and teaching techniques of string instruments. Special topics in elementary and secondary school string pedagogy are included.

EDMUS 435.3
Advanced Instrumental Conducting
1&2(3L)

Prerequisite(s): EDMUS 335, 336 and 6 credit units in music history.

An analysis and discussion of orchestral and band scores and their preparation with respect to baton technique and rehearsal procedure.

EDMUS 436.3
Percussion Techniques
1/2(3L)

Prerequisite(s): MUSIC 113 and 114.

An intensive study of playing and teaching techniques of percussion instruments including equipment and materials. Special topics in elementary and secondary school percussion pedagogy are included.

EDMUS 438.3
Teaching Choral Music in the
Secondary School
1/2(3L)

Prerequisite(s): EDMUS 428.

A methods course dealing with a study of examples of choral curricula, repertoire selection and analysis, lesson planning, programming, teaching of musical literacy, and evaluation. Also included is an examination of materials and resources, and a review of the characteristics of successful secondary school choral music programs.

EDMUS 439.3
Teaching Secondary School Music in
the Context of Arts Education
1(3L)

Prerequisite(s): EDMUS 342 (or 341) or permission of the department.

A survey and critical examination of secondary school courses in general music

and arts education. Criteria and strategies for effective secondary courses will be developed.

**EDMUS 442.3
The Organization and Administration of the School Music Program 1/2(3L)**

Prerequisite(s): MUSIC 213 and 214 and at least 12 credit units in music education or permission of the department.

Besides topics in organization and administration, studies include music and arts education curricula. Leadership and managerial styles pertaining to the music educator will be explored. Students will gain first hand experience in planning, coordinating and managing a major music festival.

**EDMUS 443.3
Brass Techniques II 1/2(3L)**

Prerequisites: Music 113 and 114 or permission of the Department.

Trombone, horn and tuba pedagogy and performance skills for music educators.

**EDMUS 479.3
Advanced Methods of Teaching Music 1/2(3S)**

Prerequisite(s): Advanced standing in the College of Education and permission of the department.

A seminar course devoted to particular problems in Music Education.

**EDMUS 490.3
Seminar in Music Education 1/2(3L)**

Prerequisite(s): EX PR 402.

A senior seminar for students who have completed the Extended Practicum in Music. It involves directed readings, seminar discussions, written assignments, classroom and rehearsal observation, and other experiences to assist students in integrating knowledge and abilities acquired from courses in Music and Music Education, and the Practicum.

GRADUATE COURSES

Department of Music, College of Graduate Studies & Research

**EDMUS 860.3
Psychology of Music 1/2(3L)**

Functions of the musical mind and factors involved in the development of musical skills and maturity.

**EDMUS 861.3
Tests and Measurements in Music 1/2(3S)**

Study and research into standardized aptitude and achievement testing in Music.

**EDMUS 863.6
A History of Music Education 1&2(3L)**

The study of the development of music education in North America and Europe with special emphasis on the Canadian scene. A feature of the course will be the comparative study of music education systems as they exist today.

**EDMUS 864.6
Seminar in Conducting 1&2(3L/S)**

Advanced techniques in choral and instrumental conducting. A major portion of the course will be devoted to laboratory experiences with campus and community instrumental and choral organizations.

**EDMUS 865.6
Seminar in Applied Music 1&2(3L/S)**

Investigates the literature, pedagogy, and performance characteristics of selected instruments (keyboard, wind, string, voice). The performance and pedagogy components will be geared to the individual needs and requirements of the student.

**EDMUS 869.6
Seminar in Music Education 1&2(3L/S)**

Investigation into current trends in music education; teaching techniques, administrative and supervisory techniques, research methods, research problems and projects.

**EDMUS 994
Research**

A student undertaking research leading to a thesis must register in this course each year until the thesis is completed. This applies to thesis work done extramurally as well as intramurally.

SPECIAL EDUCATION

GRADUATE COURSES

Department of Educational Psychology and Special Education, College of Graduate Studies & Research

**EDEXC 801.3
Assessment in Special Education 1(3L)**

Provides preparation in theory and practice of assessment methods and strategies necessary for success in the integrated practicum (EDEXC 805). Emphasizes the organizational and procedural aspects of assessment, and is directed toward providing a framework of instructional decision-making.

**EDEXC 803.3
Theory of Service Delivery in Exceptionality 1/2(3L)**

Presents models and practices of service delivery in special education. A range of service alternatives, from mainstream support to segregated settings, is outlined. Emphasis is placed upon collaboration and team decision making in selecting and implementing patterns of service options.

**EDEXC 805.3
Integrated Practicum in Special Education I 1(3L-2C)**

Prerequisite(s): EDEXC 801 and 803.

Provides students with practicum experience intended to consolidate and apply the concepts presented in the related theory classes within the program. Experience will be provided across a range of ages and exceptionalities. The practicum begins in both campus and school settings

and becomes progressively school-based. Collaboration and team decision-making are emphasized.

**EDEXC 807.3
Instruction in Special Education 1(3S-2C)**

Prerequisite(s): EDEXC 801, 803.

The intent of this class is to provide preparation in theory of instructional methods and strategies necessary for success in the integrated practicum. The emphasis in this class is upon the organizational and procedural aspects of instruction, and is directed toward providing a framework for instructional decision-making. The instructional content is delivered in the related needs classes.

**EDEXC 810.3
Language and Communication Skills 1/2(3L)**

Prerequisite(s): EDPSE 410 (formerly EDEXC 410); or equivalent.

Information concerning mild and moderate degrees of language and communication difficulties is presented. Relationships to academic success are discussed. Primary emphasis is placed on improving listening and speaking skills. Reading and writing skills are stressed as they contribute toward the development of communicative competence. Assessment and intervention issues are also addressed.

**EDEXC 812.3
Teaching Behaviour and Social Skills 1/2(2L-1S)**

Presents generic strategies for assessment and educational intervention with children/youth who have behaviour and social problems. While relevant theory and research are reviewed, major emphasis is placed on practical strategies for improving behaviour in the school setting.

**EDEXC 814.3
Cognitive and Academic Skills of Exceptional Persons 1/2(3L)**

Provides students with knowledge of theory, research, and practice related to the understanding and teaching of exceptional children who have specific instructional needs in the cognitive and academic domains. Central topics include: application of models of cognitive processes, history and methods of cognitive strategy instruction, metacognition, and cognitive processes underpinning academic instruction for exceptional students.

**EDEXC 816.3
Transitional Needs in Special Education 1/2(3L)**

Examines critical issues surrounding the transition of students with learning and behaviour disorders to less restrictive educational settings, post-secondary school, and work environments. Current models for transitional services, assessment practices, formalized transitional plans, and strategies for plan implementation and evaluation will be critiqued.

**EDEXC 821.3
The Study of Intellectual Disabilities: Theory 1&2(3L)**

Examines intellectual disabilities with reference to identification, assessment and diagnosis, classification schemes, etiologies, behavioural manifestations, societal attitudes and societal responsibilities. While this course addresses practical solutions to the problems that persons with intellectual disabilities face, the emphasis of the course is theoretical.

**EDEXC 824.3
Teaching Language and Communication Skills 1/2(3L)**

Prerequisite(s): EDEXC 810; or equivalent.

Provides an in-depth study of the theoretical basis of language and communication development and disorders. An integrated approach to assessment and intervention will provide relevant information on theoretical issues that have both direct and practical implications in working with individuals having communication difficulties.

**EDEXC 831.3
Behaviour Disorders of Children and Youth: Introduction to Theory and Practice 1/2(3L)**

Prerequisite(s): EDEXC 812.

Provides an introduction to the interdisciplinary nature of behaviour disorders in children and youth and the broad functions that support pedagogical and clinical practice. Focus will be directed towards presenting research, theory and practice grounded in replicable experimental data. Students in special education, educational psychology and psychology may find this course useful.

**EDEXC 833.3
Theoretical Foundations of Learning Disability 1/2(3L)**

Provides a comprehensive overview of the field of learning disabilities, its diverse theoretical issues, historical roots and emerging directions. Methods of recognition at different life stages will be covered as well as appropriate intervention strategies.

**EDEXC 853.3
Seminar in Teaching Language and Communications Skills 1/2(1L-2S)**

Prerequisite(s): EDEXC 810 and 824 .

A deeper examination of the theory of language and communication difficulty. Intensive review and critique of current research on the psychological, psycholinguistic, and cognitive aspects of language and communication dysfunction.

**EDEXC 859.3
Seminar in Learning Disabilities 1/2(1L-2S)**

Prerequisite(s): EDEXC 833.

An in-depth study of the most recent theories in the field of learning disabilities. Each student will undertake a major search of the literature and present one aspect of

basic skills, the models of processing and the way learning disabilities interfere with normal acquisition of this basic skill.

**EDEXC 862.3 (Formerly 861)
Special Problems: Intellectual Disabilities 1&2(3S)**

Prerequisite(s) or Corequisite(s): EDEXC 821.

This is a seminar class which examines topics of major interest associated with intellectual disabilities. Topics are chosen each year on the basis of student interest and critical need as determined by the instructor. Students participate in all seminars and must provide a minor graduate-level paper on a chosen topic.

**EDEXC 868.3 (Formerly 867)
Behaviour Disorders of Children and Youth: Advanced Theory and Practice 1(3S)**

Prerequisite(s): EDEXC 831.

Focuses on the empirically-based education and clinical management of behaviour disorders in children and adolescents. Critical issues related to theory, assessment practices, and treatment approaches are examined

**EDEXC 886.1/887.2/888.3
Trends and Issues in the Education of Children and Youth with Special Needs 1/2(1S), 1/2(2S), 1/2(3S)**

Prerequisite(s): Permission of the instructor.

Reviews the theoretical and practical bases of emerging trends in the education of children and youth with special education needs. Regular faculty with specific expertise or visiting scholars on sabbatical leave will offer the course periodically. The course is adaptable for intensive, short-term offerings by outstanding visiting scholars.

**EDEXC 898.3/899.6
Individual Study 1/2(3P), 1&2(3P)**

These courses consist of the writing of a minor thesis based on extensive readings or on experimental study. The project must be planned, carried out and reported by the student under the supervision of a faculty supervisor.

**EDEXC 990
Seminar on Exceptionality**

Non-credit course for graduate students in Education of Exceptional Children. On-going research and development projects of faculty and students form the focus of a series of seminars.

**EDEXC 992.6
Project**

The project for students registered in a project Master's degree. It is a compulsory course for the non-thesis Master's route. The project must be accepted by a committee of the department and evaluated by the committee.

**EDEXC 994
Research**

A student undertaking research leading to a Master's thesis must register in this course each year until the thesis is completed. This applies to thesis work done extramurally as well as intramurally.

TECHNICAL EDUCATION

Department of Curriculum Studies, College of Education

**EDTEC 272.3
Curriculum in Industrial Education 2(3L)**

Prerequisite(s): EDCUR 200 and completion of 30 credit units at the university or permission of the department head.

Deals with the planning and organization of courses of study in both Vocational Education and Industrial Arts. Students in either of these specializations may pursue work that is pertinent to their fields. Emphasis is on systematic and methodical preparation of learning programs.

**EDTEC 274.3
Organizations and Communications in Industrial Education 1/2(3L)**

Prerequisite(s): Restricted to Post-Secondary Vocational Certificate students or permission of the department head.

Enables students to make an introductory examination of interpersonal communication and how it is applicable to educators. The work experiences of students will be used to assist in making the transition from workers in an organization to instructors in an organization. Skill development exercises will be provided.

**EDTEC 373.3 (Formerly 273)
Instructional Materials in Industrial Education 1/2(3L)**

Prerequisite(s): EDTEC 272 or permission of the department head. Restricted to 3rd and 4th year Industrial Arts and Vocational Education students.

Deals with preparing and selecting learning aids appropriate for Vocational Education and Industrial Arts. Emphasis is on the development of teacher-competence in designing, developing, and applying materials that can be used to facilitate individual as well as group learning.

**EDTEC 374.3 (Formerly 276)
Methods for Teaching Industrial Education 2(3L-2P)**

Prerequisite(s): EDTEC 272 or permission of the department head. Restricted to 3rd and 4th year Practical and Applied Arts students.

The teacher's role is regarded as being a manager of learning and the organizational, leadership, and control aspects of this role are examined. Experience will be gained in planning instructional activities and in delivering instruction through the use of micro-teaching.

**EDTEC 375.3 (Formerly 275)
Evaluation in Industrial Education 1/2(3L)**

Prerequisite(s): EDTEC 272 or permission of the department head. Restricted to 3rd and 4th year Industrial Arts and Vocational Education students.

Deals with evaluating Practical Arts students through testing, observation and project assessment. Item preparation will focus on practical or performance tests. The nature of most Practical Arts activities

requires an emphasis on performance observation. Basic statistical concepts appropriate for Practical Arts teachers are studied.

**EDTEC 476.3 (Formerly 376)
Advanced Methods for Teaching Industrial Education 2(3L)**

Prerequisite(s): EX PR 402 or permission of the department head. Restricted to Practical and Applied Arts students.

Study of the basic principles, techniques, advantages, and limitations of individualized competency-based instruction. Applications to institutional settings, apprenticeship, cooperative work-experience programs, and on-the-job training are considered.

**EDTEC 477.3 (Formerly 277)
Facility Planning in Industrial Education 2(3L)**

Prerequisite(s): Restricted to 3rd and 4th year Industrial Arts and Vocational Education students or permission of the department head.

Industrial educators are responsible for operating costly facilities. An understanding of the principles underlying their design is essential. The intended functions to be carried on in the facility dictate its design and operation and the emphasis is on this aspect rather than technical construction details.

ELECTRICAL ENGINEERING

Department of Electrical Engineering, College of Engineering

**E E 201.3
Electric and Magnetic Circuits II 1(3L-1.5P)**

Prerequisite(s): MATH 124 and E P 155.

Topics include magnetic fields, series and parallel magnetic circuits; electromagnetic induction, self and mutual inductances, transients in R-L circuits; generator and motor actions; waveform and frequency, average and rms values; voltage drops in R, L and C circuits; phasor representations of sinusoidal quantities; single phase series and parallel ac circuits; apparent, real and reactive powers, complex power, power factor; ammeters, voltmeters, wattmeters, and multimeters, impedance and frequency measurements.

**E E 212.3
Passive AC Circuits 2(3L)**

Prerequisite(s): MATH 124 and E E 201.

Basic concepts in AC circuits, power factor, real, reactive and complex power. Loop and nodal analysis, circuit theorems and their application in AC circuits. Wye-delta transformation, series and parallel resonance, circuit response to variable frequencies. Circuit representation of transformers, utilization of the per unit system, Polyphase system, three phase 3-wire and 4-wire systems, star and wye connections, balanced and unbalanced three phase systems, power measurement in three phase systems.

**E E 214.3
System Modelling and Network Analysis 2(3L)**

Prerequisite(s): MATH 124 and E E 201.

Deriving differential equations for electrical and mechanical systems, solving differential equations for initial conditions and a step input, the Laplace transform, Second Order Systems, solving transient response by the Laplace transform, Simulation with Matlab/Simulink, Frequency Response, Passive Filters, Network Synthesis, Two-Port Networks.

**E E 216.3
Probability, Statistics and Numerical Methods 1(3L)**

Prerequisite(s): MATH 124.

Tabular and graphical representation of data, Probability, Random variables and discrete probability distributions, Continuous probability distributions, expectation, confidence interval, Testing of hypotheses, Method of least squares, Software packages for statistical analyses. Numerical Methods: Random numbers and random sampling, Interpolation and spline functions, Solutions of equations in one variable, solutions of systems of linear equations, Numerical differentiation and numerical integration, Solutions of differential equations, Fast Fourier Transform, Optimization.

**E E 221.3
Analog Electronics 1(3L)**

Corequisite(s): E E 201 (or G E 212).

Introduction to solid state electronics. Emphasis is on circuit design concepts with extensive discussion on diodes and diode circuits and on bipolar junction transistors (BJT) and field effect transistors (FET) as amplifiers and as switches.

**E E 232.3
Digital Electronics 2(3L)**

Prerequisite(s): E E 221.

An introduction to digital logic including combinational and sequential logic devices and circuits. Covers the range from the fundamentals of Boolean algebra and the binary number systems to combinational and sequential circuit functional blocks such as adders, multiplexers, counters and state machines. Some coverage is also given to electronic characteristics of real logic devices and field programmable gate arrays (FPGA).

**E E 271.3
Materials and Heat Transport in Electrical Engineering 1(3L)**

Prerequisite(s): CHEM 111 (beginning 2003 CHEM 114) and E P 155.

Basic concepts in materials science, crystals, kinetic theory, heat capacity, thermal fluctuations, Boltzmann equation, x-ray diffraction, crystal imperfections, solid solutions, alloys, mechanical properties, electrical properties, thermal properties, heat transport by thermal conduction, radiation and convection; and applications of these concepts in electrical

engineering. Practicum and design based on these topics.

**E E 292.2
Electrical Engineering Laboratory I
2(3P)**

Corequisite(s): E E 212 and 232.
Experiments related to Passive AC circuits, Analog Electronics and Digital Electronics. Introduction to Electrical Engineering laboratory equipment and experimental methods.

**E E 301.3
Electricity, Magnetism and Fields
1(3L)**

Prerequisite(s): E E 201 and E E 212.
Review of vector calculus, static electric and magnetic field theory and its extension into time varying E and M fields, interaction between fields and materials, transmission line, wave guide and antenna fields.

**E E 311.3
Electronics
1(3L-1.5P)**

Prerequisite(s): E E 201 (or G E 212).
An introductory service course in electronics. Topics include Thevenin's theorem, Norton's theorem, operational amplifiers, filters, an introduction to diodes, BJT, FET, diode circuits, and electronic amplifiers. Digital electronics, Boolean algebra, shift registers, and memory devices.
Note: Electrical Engineering students may not take this course for credit.

**E E 314.3
Electrical Power Systems
1(3L-1.5P)**

Prerequisite(s): E E 201 (or G E 212) and MATH 224.
An introduction to three-phase power circuits and fundamentals to dc, ac induction type and synchronous machines.

Note: Electrical Engineering students may not take this course for credit.

**E E 323.3
Electronic Instrumentation
1(3L)**

Prerequisite(s): E E 221 and E E 232.
Topics include: operational amplifier circuits, such as instrumentation amplifier, active filters, and precision rectifiers; noise sources and noise reduction techniques; transducers; virtual instrumentation; analog and digital interfacing such as A/D converters, D/A converters, sample and hold circuits, and digital instrumentation buses.

**E E 331.3
Microprocessor Hardware and Software
1(3L)**

Prerequisite(s): E E 232.
Covers the architecture and operation of microprocessors and memory devices, linking together of logic devices. The assembler language is introduced to program low level functionality of microprocessors.

**E E 332.3
Real Time Computing
2(3L)**

Prerequisite(s): E E 232 and 331.
The functional blocks studied in E E 331 are used to describe the architecture and operation of microprocessors and memory devices. In addition, the course covers the linking together of logic devices and interfacing digital logic with analog inputs and outputs. The course also covers embedded processor systems (micro-controller) and application specific I/O interfacing techniques.

**E E 341.3
Electric Machines I
2(3L)**

Prerequisite(s): E E 212.
Basic concepts of transformers: transformer on no-load, equivalent circuit, transformer tests, transformer performance, three-phase transformers. Direct current machines: field excitation, commutation, armature windings, armature reaction, saturation curve, voltage buildup in a dc generator, steady-state operating characteristics of dc generators, dc motors, speed regulation of dc motors, steady-state operating characteristics of dc motors, torque-speed characteristics of dc motors, starting of dc motors, losses and efficiency of dc machines. Three-phase induction motors: synchronous speed and slip, rotating magnetic field, equivalent circuit of an induction motor, no load and locked rotor tests, torque-slip curve of an induction motor, losses and efficiency, starting of induction motors, speed control of induction motors, single-phase induction motors.

**E E 342.3
Power Systems I
1(3L)**

Prerequisite(s): E E 212.
This course covers generation of energy, components of a modern power system, three-phase systems; voltage, current and power calculations, per-unit system, modelling of transformers, single-line diagrams, Inductance and capacitance calculations of single- and three-phase lines, transmission lines; modeling, steady-state operation and compensation, power system controls; local and central controls.

**E E 344.3
Power Electronics
2(3L)**

*Prerequisite(s): E E 323.
Corequisite(s): E E 341.*
Introduction to switching devices: volt-ampere characteristics of BJTs, thyristors, GTOs, IGBT and MOSFETs, switching losses. Average, rms and peak current and voltage ratings of power electronic devices. Commutation of power electronic devices; analyses of uncontrolled and controlled converter circuits, single-phase and three-phase AC-DC converters, DC drives. Principle of DC to DC conversion: analyses of boost and buck choppers. Principle of DC to AC conversion, application of inverters, analysis of inverter circuits, voltage control in inverter circuits, reduction of output harmonics in inverters. Snubber circuits. Emphasis will be placed,

throughout the course, on the utilization of software application packages.

**E E 351.3
Spectrum Analysis and Discrete Time Systems
1(3L)**

Prerequisite(s): Math 223, 224 and E E 214.
This course reviews input/output relationship from the perspective of linear differential equations and introduces convolution integrals as a general solution. Mathematical concepts of spectrum, the Fourier series for periodic signals and the Fourier transform for aperiodic signals, are covered to understand the spectrum of signals based on continuous time. Then, starting from sampling and related phenomena, discrete time base is introduced leading toward difference equations and the z-transform. Following the full discussion of the z-transform, basic concepts of DSP and the use of FFT are briefly covered.

**E E 352.3
Communication Systems
2(3L)**

Prerequisite(s): E E 351.
The course provides an introduction to communication systems beginning with digital signal representation and digital transmission. Frequency translation and amplitude modulation are discussed including the variants of DSB, SSB, VSB and QAM.

**E E 362.3
Digital Signal Processing I
2(3L)**

Prerequisite(s): E E 351.
Representation of signals and systems in discrete time functions and in z-transform, digital system response by difference equations, digital filters, convolution and correlation, frequency analysis, discrete time Fourier transform (DFT).

**E E 372.3
Electronic Devices
1(3L)**

Prerequisite(s): E E 201 and 271.
Quantum physics, Schrödinger equation, quantized energy levels, quantum numbers, photons, bonding, energy bands, electron statistics, semiconductor basics, extrinsic semiconductors, pn junction, pn junction characteristics and models, bipolar junction transistor (BJT), junction field effect transistor (JFET), metal-oxide-semiconductor transistor (MOST), enhancement and depletion MOSFETs, BJT, JFET and MOS transistor equations, biasing, amplifier circuits and small signal parameters and models.

**E E 391.3
Electrical Engineering Laboratory II
1(6P)**

*Prerequisite(s): E E 292.
Corequisite(s): E E 323, 331, and 351.*
Laboratory experiments and exercises of design software packages for the corequisite courses.

**E E 392.3
Electrical Engineering Laboratory III
2(6P)**

*Prerequisite(s): E E 391 (taken), 342, 372
Corequisite(s): E E 332, 352 and (341 or 362).*
Laboratory experiments and exercises of design software packages for the corequisite courses.

**E E 395.3
Electrical Engineering Design
2(1.5L-1.5P)**

Prerequisite(s): E E 323.
Covers the "top down" approach applied to engineering design. The students will exercise the approach by designing, building and testing one or two projects. The course also includes aspects of manufacturing engineering and, project organization and control.

**E E 402.3
Microwave Engineering
2(3L)**

Prerequisite(s): E E 301.
Review of EM field theory, transmission line theory, Smith chart, impedance matching, microwave transmission lines, coaxial and wave guide components, resonators, microwave antennas.

**E E 431.3
Hardware Descriptive Language
2(3L)**

Prerequisite(s): E E 232 and CMPT 117.
Discusses hardware descriptive language (HDL) and techniques to design application specific integrated circuits (ASICs) for specific applications such as digital filters and embedded controllers. HDL is a C like language allowing parallel processing description and timing control. The detailed syntax of HDL will be presented along with techniques for problem analysis and circuit synthesis using field programmable gate arrays (FPGA) and more advanced Embedded Arrays that includes a built-in CPU.

**E E 432.3
VLSI Circuit Design
2(3L)**

Prerequisite(s): (E E 232 and 372) or (E P 311 and 321).
A general introduction to VLSI design, simulation and testing. This includes CMOS cell design, logic simulation, circuit simulation and system design.

**E E 441.3
Power Systems II
1(3L)**

Prerequisite(s): E E 342.
This course covers network calculations; loop and nodal equations; bus impedance and admittance matrices; network equations in matrix form; computer storage.; load flow studies; analysis of faulted power systems; symmetrical components; sequence networks; balanced and unbalanced faults; power system stability; swing equation; equal area criterion; and numerical solution of swing equation.

**E E 442.3
Power Systems Operation and Control
2(3L)**

*Prerequisite(s): E E 342.
Corequisite(s): E E 341.*

This course looks at economic dispatch; the lossless case; inequality constraints; consideration of transmission losses; unit commitment; system control; control loops; the automatic voltage regulator; automatic load frequency control of a single-area system; implementation using computers; system protection; subsystems and attributes; zones of protection; transducers; relay design; protection of lines; transformers; generators and busbars; and microprocessor-based relays.

**E E 444.3
Electric Machines II
1(3L)**

Prerequisite(s): E E 341.

This course deals with magnetic and magnetically coupled circuits, principles of electromechanical energy conversion, synchronous machines, brushless dc machines, Stepper motors, Reluctance motors, Permanent magnet machines, and Dynamic simulation of electric machines.

**E E 445.3
Reliability Engineering
2(3L)**

Prerequisite(s): E E 216.

This course covers basic reliability concepts; elements of probability and statistics; application of important distributions in reliability evaluation; reliability and availability assessment of series; parallel and complex systems; utilization of Monte Carlo simulation in system reliability evaluation; and Markov modelling in discrete and continuous systems.

**E E 456.3
Digital Communication
1(3L)**

Prerequisite(s): E E 352.

Topics include: digital modulation methods; receiver synchronization; noise and bit error ratio in receivers; wireless and satellite communication systems; and spread spectrum communication.

**E E 458.3
Communication Electronics
2(3L)**

Corequisite(s): E E 352.

An introduction to devices and circuits commonly used in communications systems. Emphasis is on circuits extending into the radio frequency (RF) range, where familiar devices require a new understanding. Topics include resonant circuits, transformers, impedance matching concepts, transmission line hybrids, power amplifiers, frequency multipliers, phase locked loops, oscillators, and frequency synthesizers. This course is intended for students concentrating in the communications area.

**E E 461.3
Digital Signal Processing II
1(3L)**

Prerequisite(s): E E 362.

This course covers Finite impulse response linear phase filters, infinite impulse response filters, architecture of digital filters, DSP processors and special instruction sets, discrete Fourier transform DFT and fast Fourier transform FFT, and Finite register length effects.

**E E 472.3
Optoelectronics and Photonics
2(3L)**

Prerequisite(s): E E 372.

Topics include: physical optics, dielectric planar waveguides, optical fibers in optical communications, dispersion, bit-rate and bandwidth, semiconductor device principles, degenerate semiconductors, heterojunctions, light emitting devices, stimulated emission, Einstein coefficients for lasing devices, gas lasers, semiconductor lasers, new solid state lasers, emitters for optical communications, photodetectors, photodetectors for optical communications, photovoltaics, light modulation.

**E E 480.3
Digital Control Systems
2(3L)**

Prerequisite(s): E E 481 (or 410).

This course deals with specialized topics in feedback control. Topics include state-space modeling of control systems, digital computer simulation of control systems and digital computer stability analysis of multi-variable processes; controller synthesis using Nyquist criterion; direct digital control, z-transform methods for assessing stability of sampled data systems, and introduction to other topics in modern control theory.

**E E 481.3
Control Systems
1(3L)**

Prerequisite(s): E E 351 or Math 338.

Topics include mathematical modeling of control elements and systems, performance analysis, stability assessment and system compensation. Both time domain and frequency domain techniques are used. Multi-variable processes are discussed using state space models. Discussion extends to the basic concepts of controller design, root locus method and frequency response method. Controller design methods specific to phase lead/lag compensator and PID controller are presented. MatLab control tools are used in computer simulation and in various analyses of control systems.

**E E 495.6
Design Project
1&2(6P)**

Corequisite(s): In graduating year or permission of the Department Head.

The emphasis in this course is on the application of a formal design process. Students will be formed into working groups of two or three to design, in a top down fashion, a product or system. The students start from a layman's statement of what is needed and produce a requirement specification, block level design and a

working unit. Under special circumstances, feasibility studies may qualify as design projects. The students are also required to give a formal oral presentation of their year's work to a group of their peers.

GRADUATE COURSES

Department of Electrical Engineering,
College of Graduate Studies & Research

Courses for students not majoring in Electrical Engineering

**E E 701.3
Introductory Circuits and Electronics
1/2(3L-3P)**

A lecture/laboratory course designed for students who have little or no background experience in electronics but who wish to obtain a working knowledge of electronic devices and techniques. Fundamentals of electricity and basic laws governing voltage and current in circuit elements with direct and alternating current excitation; charge carriers in vacuum and semiconductor materials; the diode and diode circuits; the junction transistor, equivalent circuit at low frequency, the basic amplifier circuit, biasing, and digital electronics. It is expected that students will follow up with E E 702 to achieve a useful level of experience in the application of electronic devices.

**E E 702.3
Electronic Instrumentation
1/2(3L-3P)**

Prerequisite(s): PHYS 227 or G E 212; or equivalent experience approved by the Head of Department.

A lecture/laboratory course for students whose main interest is in fields other than electrical engineering but have a background knowledge of elementary electric circuits and principles of electronics. Deals with electronic instruments and their application, in measurement, automatic control, computation, and other areas related to the interests of the students.

Courses for students majoring in Electrical Engineering

**E E 740.3
Introduction to Real-Time Computing
1/2(3L-3P)**

The main purpose of this course is to become familiar with the capabilities and use of the computers in the College of Engineering. Topics include capabilities of the operating systems, system utilities, real-time capabilities and their use. Main emphasis will be placed on an awareness of system capabilities and hands-on use of the system.

**E E 800.3
Circuit Elements in Digital Computations
1/2(3L-3P)**

The electrical circuit aspects of digital systems. Includes: logic devices, data bus design, processor architecture, input-output techniques, input-output devices, magnetic and electronic storage devices, computer communication techniques and devices.

**E E 801.3
Advanced Non-Linear Circuits
1/2(3L)**

General principles of design of pulse circuits from the milli-second to nano-

second regions. Semiconductor two and three terminal devices will be discussed with reference to pulse generation, wave shaping, etc. The operation and limitations of digital integrated circuits will be dealt with. Devices and techniques will be highlighted by investigating a number of selected applications. Some laboratory sessions may be included.

**E E 802.3
Advanced VLSI Design and Analysis
1/2(3L-3P)**

A study of semiconductor devices with special emphasis placed on device operation in VLSI circuits. Topics include device physics, electrical characteristics, computer simulation of circuits, speed-power-area considerations, and MOS integrated circuit design. Laboratory sessions will examine device measurement and simulation. A design project is also required.

**E E 804.3
Passive and Active Linear Network Synthesis
1/2(3L)**

Positive real functions, realization of lossless one ports, RLC Driving point function synthesis, passive two port synthesis; an introduction to the synthesis of active networks.

**E E 805.3
Real-time Data Acquisition and Control
1/2(3L-3P)**

Prerequisite(s): E E 740 and CMPT 122; or equivalent.

Advanced data acquisition and control in an engineering environment. Real time control using analog and digital inputs and outputs. Processing delays associated with data acquisition software. Hardware and software techniques for noise reduction and signal conditioning.

**E E 809.3
Selected Topics in Electronic and Digital Systems
1/2(3L)**

Consists of regular lectures, assigned reading, reports, and laboratory exercises. Topics selected from the following areas: development of microprocessor based digital systems; large scale integrated circuit (VLSI) design and testing; computer aided design, testing and manufacture; high frequency linear network design; high speed digital design.

**E E 810.3
Communication Theory I
1/2(3L)**

Deterministic signal theory, noise and its physical origin, random signal theory, performance of analog and digital communication systems in the presence of noise.

**E E 811.3
Antenna Engineering
1/2(3L)**

Prerequisite(s): E E 818.

EM radiation, Green's function technique for the radiation problem, principle of equivalence, concept of magnetic current, radiations from electric and magnetic current sources, aperture antennas, lens and reflector antennas, printed antennas,

variational technique for antenna impedances, antenna array theory.

**E E 812.3
Active Microwave Devices and Circuits
1/2(3L)**

Prerequisite(s): E E 818.

Topics include: matching networks and signal flow graphs, characteristics of amplifiers and oscillators, noise theory, avalanche devices and circuits, Gunn devices, bipolar and field effect transistors, low noise amplifiers, power amplifiers, oscillators, microwave subsystems.

**E E 813.3
Introduction to Pattern Recognition
1/2(3L-3P)**

Pattern recognition systems, vector space representation of patterns. Supervised and unsupervised systems. Bayes solution. Parameter estimation. Maximum likelihood classification. Linear and nonlinear discriminants. Discussion of feature selection and clustering. A design project is also required.

**E E 814.3
Communication Theory II
1/2(3L)**

Information theory and applications in communication systems. Channel capacity and introduction to coding theory, synchronization in digital systems.

**E E 815.3
Man-Machine Communication and
Interactive Computer Systems
1/2(3L-3P)**

A wide range of techniques used in interactive computer systems utilizing audio and visual interfaces is discussed. Data acquisition fundamentals, image enhancement, texture analysis, 3-dimensional displaying techniques, sound/voice synthesis, simulation of physical systems, extraction of information from real time systems, data format conversion, associative memory, artificial intelligence and neural network.

**E E 816.3
Telephony I
1/2(3L)**

Prerequisite(s): E E 485; or equivalent.

Topics will be chosen from the following: wireline transmission of analog and digital signals with references to subscriber lines, trunks and carrier facilities. Processing and coding of analog signals for digital transmission and switching. Blocking and non-blocking connecting networks with PBX and central office applications. Data transmission in analog and digital networks.

**E E 818.3
Electromagnetic Wave Propagation
1/2(3L)**

This is a fundamental course on Electromagnetic Field Theory and Microwave Passive Circuits. Includes vector calculus, electrostatics, magnetostatics, Maxwell's equations, Poynting theorem, plane-wave solution, reflection of plane waves, rectangular waveguide, cylindrical waveguide, planar transmission lines, network parameters, branchline hybrids, dielectric resonators, isolators and attenuators, matching

networks, filters, wide band directional couplers, mixers, pin diode circuits.

**E E 819.3
Selected Topics in Communications
and Signal Processing
1/2(3L)**

Consists of regular lectures, assigned reading, reports and laboratory exercises. Depending on the interests of students and faculty, topics will be selected from the following areas: electromagnetic wave propagation, fiber optic transmission systems, digital microwave and satellite transmission, image processing and pattern recognition for robotic and remote sensing applications.

**E E 820.3
Electrical Materials Science
1/2(3L)**

Review of general solid state physics for electrical engineers. An introduction to Wave-Mechanics. Band theory of solids, metals, semiconductors and insulators. Electrical conduction in solids. Structure and properties of materials for device applications.

**E E 821.3
Magnetic Properties of Materials
1/2(3L)**

Brief review of the magnetic properties of bulk materials, domains in bulk and thin films; preparation of thin films; anisotropy and magnetization reversal; structure and switching of permalloy films with applications to computers; magnetic measurements, ferromagnetic resonance; paramagnetic resonance.

**E E 823.3
Solid State Electronic Devices
1/2(3L)**

Physics of semiconductors, emphasis on electronic and optical properties; growth mechanisms, determination of structures, modification of bulk properties, microelectronics, thin and thick films, review of recent developments in electronic materials. Principles of semiconductor devices.

**E E 829.3
Selected Topics from Optical
Electronics and Imaging Science
1/2(3L)**

Basic theory with emphasis on relationship between electronic structure and optical properties of solids; Einstein A and B coefficients for stimulated transitions; the density matrix; inhomogeneous broadening; quantum noise; application of Lasers; Fourier theory to the analysis and synthesis of optical imaging, holography and electrophotography.

**E E 830.3
Electronic Instrumentation
1/2(3L)**

Sensor design and application in general, with detailed examples, followed by an examination of the problems, their use in process control and data logging, and analysis and presentation of results.

**E E 832.3
Automatic Cartography
1/2(3L)**

The engineering design concepts relative to assembling a system of automatic

cartography which is closely related to the needs of cartographers and hydrographers. Computer control of system, automatic graph plotters, automatic and semi-automatic digitizing units and display systems.

**E E 840.3
Mathematical Methods in Engineering
1/2(3L-3P)**

Techniques for solving sets of linear algebraic equations using direct and iterative methods; methods for solving non-linear algebraic equations using digital computer methods; simulation methods for large scale dynamic systems; fast Fourier transform method and digital computer solutions to other transform methods.

**E E 841.3
Numerical Methods in Power System
Analysis
1/2(3L-3P)**

A brief review of matrix theory. Laplace transform methods, and stability criteria of control systems. State space representation and the application of numerical techniques for investigating the effects of controller adjustments on power system dynamics. Digital computer programming methods for obtaining load flow solutions and analyzing large complex control systems.

**E E 845.3
Random Variables in Engineering
Systems
1/2(3L)**

Random variables, functions of random variables, expectations, characteristic function, joint densities and distributions, sequences of random variables, concept of stochastic processes. The emphasis is on developing a working knowledge of the above theory in engineering applications.

**E E 850.3
Reliability Engineering
1/2(3L)**

Basic reliability concepts, elements of probability and statistical theory, application of important distributions, reliability in series, parallel and complex systems. Application of Markov chains in the evaluation of repairable system reliability. Utilization of Monte Carlo simulation in basic system reliability evaluation.

**E E 851.3
Power System Reliability
1/2(3L)**

Reliability evaluation of static and spinning generating capacity requirements. Interconnected system reliability concepts. Transmission system reliability evaluation. Determination of composite system reliability. Distribution system reliability evaluation. Incorporation of customer interruption costs in the evaluation of power system reliability worth.

**E E 860.3
Power System Analysis
1/2(3L)**

System representation and analytical techniques required in the solution of power system steady state and transient problems. The use of analog and digital computers in load flow, fault and stability studies is emphasized. Insulation co-ordination, hv-dc transmission, power system reliability and control are briefly discussed.

**E E 861.3
Advanced Power System Analysis
1/2(3L)**

Symmetrical components, balanced and unbalanced power system fault studies. B and O; positive plus negative, positive minus negative and O sequence components. Simultaneous faults. Sequence impedances of lines and cables. Measurement of sequence voltages, currents and impedances. Performance of relays during faults and swings are briefly discussed.

**E E 863.3
High Voltage Direct Current
Transmission
1/2(3L)**

Economics of direct current bulk power transmission. Converter circuits and valve connections. Analysis of bridge connected rectifiers and inverters. Grid control, compounding and regulation. Artificial commutation of bridge rectifiers. High voltage mercury arc and thyristor valves. Control of dc transmission lines. Harmonics in ac and dc systems. Reactive power requirements. D.C. corona.

**E E 865.3
Power System Relays and Protection
1/2(3L)**

Electromagnetic and electronic protective relay devices. Overcurrent undervoltage, underfrequency, distance, pilot wire and carrier protective relay schemes. Protection of generators, transformers, lines and bus bars. Back up protection. Maintenance and testing of relays.

**E E 866.3
Power System Modeling and Control
1/2(3L)**

Modeling of power systems: synchronous machines, HVDC lines, static var compensators (SVC), loads and the power network. Small-disturbance modeling and large-disturbance modeling; control of power systems: automatic generations control (AGC), frequency and voltage control. Control of power system damping and transient stability.

**E E 867.3
Economic System Operation
2(3L)**

Basic concepts of economic system operation; determination of system transmission losses; development of transmission loss formulae co-ordination of incremental production costs and incremental transmission losses in composite hydro-thermal systems; economic load dispatch in thermal systems by dynamic programming; optimal economic operation of hydro-thermal systems and risk constrained unit commitment and economic load dispatch.

**E E 868.3
Digital Techniques for Power System
Measurements and Protection
1/2(3L-1.5P)**

Conditioning and sampling of power system data. Digital techniques for estimating voltage and current phasors. Measuring current, voltage, power, reactive power, power factor, frequency and rate of change of frequency. Digital techniques for protection of generators, transformers, reactors, capacitors and, transmission and distribution lines.

E E 869.3
Advanced Topics in Power System Analysis and Design
 1/2(3L/R/P)

Consists of assigned reading, lectures by staff members, discussion periods and laboratory exercises with reports. Topics will be selected from the following areas of analysis and design of electric power systems. Switching and lightning surges, insulation coordination; composite system reliability evaluation, reliability of substations; digital relays, analog and digital filters; sensitivity analysis and simulation of outages; second-order load flows; optimal and adaptive control of power systems; planning and operation of power systems.

E E 870.3
Theory of Electrical Machines
 1/2(3L)

Review of fundamental laws, including Maxwell's equations. Coupling concepts, voltage equations and equivalent circuits of static and dynamic machines, operational implications of these aspects in transformers, induction and synchronous machines. Symmetrical and unsymmetrical windings, distribution of field and current-loading, production of constant and pulsating torques, harmonic torques. Introduction to generalized electrical machine theory.

E E 871.3
The Generalized Theory of Electrical Machines
 1/2(3L)

Basic principles of the general theory. The generalized rotating machines and its equation. Transformations of the equations. Applications to different electrical machines.

E E 872.3
Advanced Theory of Electrical Machines
 1/2(3L)

Prerequisite(s): E E 870.

Penetration of field-wave in the massive-rotor; application of Maxwell's equations; the electrical fields of transformers; shaft-voltages and fluxes, bearing-currents, oscillations in induction machines; massive-rotor induction machines; unsymmetries in stator and rotor windings; reluctance motor; asynchronous-synchronous operation of a synchronous machine; stability; power selsyns.

E E 873.3
F.H.P. Motors and Special Rotating Electromagnetic Devices
 1/2(3L)

Prerequisite(s): E E 870 recommended.

Linear theory of induction motor; single and polyphase F.H.P. motors; unsymmetrical connections and windings; shaded-pole motors; effect of saturations; hysteresis motors; Reluctance motor; stepper motors; induction-synchronous motors; applications and design considerations.

E E 874.3
Electromagnetic Acoustic Noise in Electrical Machines
 1/2(3L)

Prerequisite(s): E E 870.

Electromagnetic striction; modes of vibrations in 1-phase and 3-phase transformers; calculation of acoustic noise and means of suppression; fields and harmonics in rotating

machines, nature and analysis of noise in induction and synchronous machinery. Design considerations for limiting the noise-level in power machines.

E E 875.3
Electric Machine Transient Performance
 1/2(3L)

A study of the dynamic performance of interconnected synchronous machines taking into account their non-linear properties and the effects of speed and excitation control devices.

E E 880.3
Digital Signal Processing
 1/2(3L)

Prerequisite(s): G E 210, E E 315, 326 or equivalent; 321, 325, 484, and 485 are desirable as prerequisites.

The fundamentals of discrete signals theory for communication, telephony, image processing and biomedical engineering. The course covers discrete Fourier transform, FFT (Fast Fourier Transform), spectral analysis, FIR (Finite Impulse Response) filters, IIR (Infinite Impulse Response) filters, DSP (Digital Signal Processing) microprocessor applications, finite word-length effects, and introduction to spectral estimation and adaptive digital filters.

E E 902.6
Advanced Electrical Laboratory
 1&2(P)

Candidates for the Postgraduate Diploma may register for work in one of the electrical Engineering Research Laboratories as in the case of the regular courses. Permission of the department must be obtained before enrolling, and will depend upon the availability of suitable facilities as well as the experience of the candidate. Normally, credit may be given for no more than 6 credit units during the academic year, following the completion of the work and the submission of a satisfactory engineering report certified by the department. This course is not acceptable for the Master's degree.

E E 990
Seminar

A seminar is held periodically throughout the regular session during which staff and graduate students discuss current research topics. Graduate students are required to attend these seminars.

E E 992.6
Project

Students undertaking the project Master's degree (M.Eng.) must register in this course. It consists of independent study and investigation of a real world problem, and submission of an acceptable report on the investigation.

E E 994
Research

Students writing a Master's thesis must register for this course.

E E 996
Research

Students writing a Ph.D. thesis must register for this course.

ENGINEERING PHYSICS

Department of Physics and Engineering Physics, College of Arts & Science

E P 155.3
Electric and Magnetic Circuits I
 2(3L-1.5P)

Prerequisite(s): G E 124 and MATH 110 (taken).

Topics include Coulomb's law, sources of dc potential, resistance, conductance, Ohm's law, power and energy, ammeters, voltmeters, voltage dividers, ohmmeter, Kirchhoff's laws, series and parallel circuits, circuit analysis techniques, Wheatstone bridge, electrostatic fields, dielectric materials, capacitance, series and parallel arrangement of capacitors, transients in R-C circuits.

E P 225.3
Waves, Fields and Optics
 2(3L-1.5P)

Prerequisite(s): E P 155; MATH 223; MATH 238 [or Math 224 (or 226) which may be taken as a corequisite].

Offers an introduction to mechanical and electromagnetic wave phenomena including derivation of wave equations and wave velocities, energy and momentum carried by waves, wave reflection in terms of impedance mismatch, standing waves, and radiation of electromagnetic waves. This is followed by geometrical and physical optics.

E P 228.3
Computer Tools for Engineering Physics
 2(3L-4P)

Prerequisite(s): CMPT116; G E 120; MATH 238 (or MATH 224 which may be taken as a corequisite)

The emphasis of this class is to investigate the practical engineering and scientific applications of mathematical techniques that were introduced previously in other classes. This goal is realized through the design and development of software systems to solve problems related to: electric circuit analysis; numerical differentiation, integration and interpolation of real world measurements; modelling of physical systems and Fourier decomposition. In the laboratory portion of this class the students write their own software to solve problems that are introduced in the formal lectures.

E P 271.3
Heat, Kinetic Theory and Thermodynamics
 2(3L-1.5P)

Prerequisite(s): MATH 238 (or corequisite MATH 224); PHYS 251.

Calorimetry, thermal expansion, heat transfer and the empirical gas laws. Kinetic theory of gases: specific heats, Boltzmann distribution. Mean free path and transport phenomena. Zeroth, first and second laws of thermodynamics. Entropy and heat engines.

E P 311.3
Electronics I
 1(3L-4P)

Prerequisite(s): E P 228 or MATH 266;

PHYS 227.

Corequisite: MATH 338.

Introduces analogue electronics. The course covers network analysis, AC circuits, the physics and operation of semiconductors, junction diodes, transistors, the design of amplifier circuits, small signal analysis, and operational amplifiers (op-amps).

E P 317.3
Applied Physics of Materials
 1(3L)

Prerequisite(s): EP 271.

Corequisite(s): PHYS 381.

Introduction to atomic structure, bonding, types of solids, crystalline states, and types of crystals. Solid solutions. Mechanical properties strain and thermal expansion. Thermal fluctuations, noise and thermally activated processes. Heat capacity of solids. Electrical conductivity of pure metals and solid solutions. Temperature dependence. Hall effect. Energy band structure in solids. Semiconductors. Classical and Fermi-Dirac statistics. Conduction in metals. Contact potential. Seebeck effect, thermocouple. Thermionic emission and vacuum tube devices. Phonons. Debye heat capacity and heat conductivity. Extrinsic, p- and n-semiconductors. Conductivity and temperature dependence. Optical absorption. Luminescence. Shottky diode. Ohmic contact and thermoelectric effect.

E P 320.3
Discrete Linear Systems and Applied Information Theory
 2(3L-3P)

Prerequisite(s): PHYS 227; MATH 224 or 238.

An introduction to discrete linear systems and applied information theory with strong emphasis on both analytic and computer based solutions to practical physical problems in systems engineering and data analysis. In the laboratory portion of this class the students write their own software to solve problems that are introduced in the formal lectures. These problems include: discrete solutions to LCR circuits; discrete filtering of measurements collected in real experiments; the frequency responses of any linear system; and amplitude modulation of signals.

E P 321.3
Electronics II
 2(3L-4P)

Prerequisite(s): E P 311.

Introduces digital electronics and completes some analogue electronic topics not covered in E P 311. Analogue topics include transducers, feedback systems, modulators, frequency converters, amplifier configurations and design. The majority of the course covers digital electronics, including logic operation and implementation (AND, OR, NOT), binary numbers, Boolean algebra, memory elements, ROM, RAM, logic circuits (adders, counter, etc.), A/D and D/A converters, and simple microprocessors. Circuit design principles are emphasised and a major design project is undertaken.

**E P 324.3
Mechanics IV
2(3L)**

Prerequisite(s): G E 226 or PHYS 223.

Corequisite(s): MATH 338.

Covers three-dimensional rigid body dynamics and introduces fluid mechanics concepts such as the control-volume approach, the continuity equation, derivation of Bernoulli's equation, and conservation of momentum and energy in a fluid system.

**E P 356.3
Electricity and Magnetism II
2(3L)**

Prerequisite(s): PHYS 227.

Corequisite(s): MATH 338.

An intermediate course in electromagnetism. After an initial section on vector analysis, electrostatics, electric fields in matter, magnetostatics and magnetic fields in matter are developed as background for electrodynamics, including EMF, Faraday's Law and induction. Maxwell's equations are treated in differential form and are used to derive the wave equation, from which electromagnetic plane waves in vacuum are treated, including energy and momentum carried by these waves, and a discussion of their transverse polarisation.

**E P 413.3
Instrumentation and Design
1(3L)**

Prerequisite(s): E P 321.

Corequisite(s): E P 414.

A course in electronic instrumentation and design of measuring equipment. Emphasis is placed on digital techniques for the measurement of physical parameters.

**E P 414.3
Instrumentation Laboratory
1(4P)**

Prerequisite(s): E P 321.

Corequisite(s): E P 413.

A number of laboratory exercises based on the material given in E P 413 are carried out. The aim of the laboratory is to introduce the student to the practical problems and challenges associated with microprocessor based instrumentation design.

**E P 421.3
Optical Systems and Materials I
1(3L-4P)**

Prerequisite(s): E P 356; E P 225 or PHYS 341.

An advanced course in physical optics. The course begins with the development of the refractive index for various isotropic materials, in particular gases, dielectrics, plasmas and metals. The description of the polarisation state of electromagnetic waves is stressed, so that the effects of anisotropy in the refractive index caused by reflection and scattering can be evaluated. Naturally anisotropic materials are discussed, along with the use of controlled anisotropy through the application of electric, magnetic and mechanical (acoustic) stresses to materials, including applications in the modulation of the polarisation state of light for optical communications. The interference of light, including coherence concepts, is then studied with application to antenna systems and diffraction gratings, synthetic aperture radar, and

interferometers, in particular Michelson and Fabry-Perot systems. Fraunhofer diffraction is treated as the Fourier transform of the aperture function, Fresnel diffraction is treated using Fresnel integrals and the Cornu spiral.

**E P 431.3
Optical Systems and Materials II
2(3L)**

Prerequisite: E P 421.

Designed to provide background in fiber optic waveguides, lasers and photodetectors in order that the principles and design of optical communications systems and of non-communication applications be treated in some detail.

**E P 495.6
Capstone Design Project
1&2(1.5L-3P)**

Prerequisite(s): E P 317 and E P 356.

Corequisite(s): E P 413, 414 and 421.

This is a year-long design project incorporating all the steps and procedures used by professional engineers.

GRADUATE COURSES

Department of Physics and Engineering Physics, College of Graduate Studies & Research

**E P 994
Research**

Students writing a Master's thesis in Engineering Physics must register for this course.

**E P 996
Research**

Students writing a Ph.D. thesis in Engineering Physics must register for this course.

**ENGINEERING PROFESSIONAL
INTERNSHIP PROGRAM**

College of Engineering

**EPIP 401.0
Internship Placement 1**

**EPIP 402.0
Internship Placement 2**

**EPIP 403.0
Internship Placement 3**

**EPIP 404.0
Internship Placement 4**

ENGLISH

Department of English, College of Arts & Science

Only 6 credit units of introductory 100-level English may be taken for credit.

**ENG 110.6
Literature and Composition
1&2(3L)**

An introduction to the main kinds of literature. In addition to learning the tools of critical analysis, students will study and practise composition.

**ENG 111.3 Literature and
Composition: Reading Poetry
1/2 (3L)**

An introduction to the major forms of poetry in English. In addition to learning the tools of critical analysis, students will study and practise composition.

**ENG 112.3
Literature and Composition:
Reading Drama
1/2(3L)**

An introduction to major forms of dramatic activity in English. In addition to learning the tools of critical analysis, students will study and practise composition.

**ENG 113.3
Literature and Composition:
Reading Narrative
1/2(3L)**

An introduction to the major forms of narrative literature in English. In addition to learning the tools of critical analysis, students will study and practise composition.

**ENG 114.3
Literature and Composition:
Reading Culture
1/2(3L)**

An introduction to historical and contemporary cultural forms in English. In addition to learning the tools of critical analysis, students will study and practise composition.

Prerequisites

6 credit units 100-level English is a prerequisite for all 200, 300 & 400 level English courses.

A few senior English courses have alternate prerequisites (see the prerequisites listed under each individual course).

**SENIOR COURSES: 200 LEVEL
FOUNDATION**

The following three courses are new requirements for all degree programmes except the 3-year B.A. Students are advised to fulfill this requirement by taking these classes as early as the second year although they may be taken at any time. Academic counselling is encouraged.

**ENG 202.6
Reading the Canon: Texts/Contexts
1&2(3L)**

A survey of English literature with primary emphasis on the historical development of the British canon (including Chaucer, Shakespeare, Milton, Wordsworth, and Austen, for example), with some attention to the critical issues raised by the concept of "canon" itself, to non-canonical writers, and to other literatures in English.

Note: Students with credit for ENG 200.6 may not take this class for credit.

**ENG 203.6
Reading English: Critical Approaches
1&2(3L)**

An introduction to the major critical perspectives on reading literature, with particular emphasis on the 20th century. The course will typically explore a number

of critical approaches to reading and test them on a selection of literary works.

Note: Students with credit for ENG 282.6 may not take this class for credit.

**ENG 204.6
The History and Future of the Book
1&2(3L)**

An introductory history of the concept and technology of the book. The course focuses on the development of the book as a vehicle of communication and on its ideological and political impact, with some attention to the emergence and consequences of digital platforms such as e-mail, the web, and electronic books.

The following classes are not requirements in any degree programme. Students who wish to take these classes are advised to do so early in their programmes and to note that they MAY NOT BE SUBSTITUTED for ENG 202.6, 203.6, or 204.6 listed above.

**ENG 262.6
Advanced Composition
1&2(2L)**

Intended for students who are interested in developing their skill at expository writing. With the help of examples drawn from modern writers, the fundamentals of rhetoric and good prose style will be studied and practiced. Enrolment will be limited.

Note: This course may not be taken for credit towards the honours program.

**ENG 277.3
Literary Uses of Mythology
1/2(3L)**

An introduction to the theory of myth and selected examples of the classical and other myths most frequently adapted and reinterpreted in literature in English. Emphasizes the ways in which different writers can find quite different kinds of significance in the same myth.

**ENG 281.6
Feminist Critical Theory and
Literature by Women
1&2(3L)**

Several contemporary feminist critical approaches will be used to analyze writings by women from various parts of the English-speaking world.

**ENG 283.6
Literature and Colonialism
1&2(3L)**

An introduction to reading and research in literature and its colonialist contexts.

**ENG 294.3
Techniques of English Poetry
1/2(3L)**

An introduction to poetic technique, primarily metre, form, sound, and diction.

SENIOR COURSES: 300 LEVEL

Courses listed below previously taken at the 200 level will be counted as 300-level classes; e.g. students who have completed ENG 201 may not take ENG 301 for credit.

**ENG 301.3
Anglo-Saxon Language
And Culture
1/2(3L)**

Discussion of the importance of Old English language and literature for the Anglo-Saxon culture of early medieval England. Investigation of this language as foundation for the development of English. Introductory study of texts such as *Beowulf* and writers such as King Alfred.

Note: Students with credit for ENG 208.6 may not take this class for credit.

**ENG 306.3
Old Icelandic Language and Culture
1/2(3L)**

The impact of the Old Norse language and literature on the language and cultural identity of the Anglo-Saxons. Study of Old Norse language to approach the literature and culture of these North Germanic people. Examination of texts pertinent to the Viking attacks on and settlement in Anglo-Saxon England.

Note: Students with credit for ENG 207.6 may not take this class for credit.

**ENG 310.3
Old English Literature
1/2(3L)**

Prerequisite: ENG 301.

A study of several poems and some prose passages in Old English, including elegies, battle narratives, and a more extensive consideration of *Beowulf* than in English 201.3, including its backgrounds and analogues.

Note: Students with credit for ENG 208.6 may not take this class for credit.

**ENG 311.3
Chaucer and Medieval Makers
1/2(3L)**

Study of late medieval literature in English. Attention to writings by Chaucer, Langland, and the Gawain-poet, as well as those by fifteenth-century writers such as Margery Kempe, Sir Thomas Malory, and Robert Henryson.

Note: Students with credit for ENG 212.6 may not take this class for credit.

**ENG 313.3
Middle English: Dialect to Standard
1/2(3L)**

Study of the Middle English period, 1100-1500. Attention to the features, development, and status of regional dialects in a multilingual context. Emphasis on literary texts (such as *Ancrene Wisse*, *Patience*, and *The Paston Letters*) as witnesses to the varieties of English during the later middle ages.

Note: Students with credit for ENG 212.6 may not take this class for credit.

**ENG 314.3
Medieval Drama
1/2(3L)**

A survey of the variety of drama performed in the British Isles before 1550. A study of the plays in their historical context. It also examines their relation to custom and ritual; their social function; their performance and production; and the responses to them of medieval and modern audiences.

**ENG 315.3
Old Icelandic Literature
1/2(3L)**

Prerequisite: ENG 306.

A study of several Old Icelandic sagas and passages of Eddaic and of skaldic poetry. Critical approaches to Old Icelandic literature. Cultural backgrounds, as well as theories of saga composition, and continental influences.

Note: Students with credit for ENG 207.6 may not take this class for credit.

**ENG 317.3
Introduction to Old Norse Mythology
1/2(3L)**

A study of the mythology of medieval Scandinavia, including a survey of the sources, an examination of several chief deities and myths associated with them, and a consideration of some old Icelandic literary evidence.

Note: As of January 1, 2000 this class no longer fulfills a Category 1 requirement.

**ENG 320.6
16th-Century Literature
1&2(3L)**

A study of the Renaissance in England through the poetry and prose of such writers as More, Wyatt, Sidney, Spenser, and Bacon.

**ENG 321.6
Shakespeare
1&2(3L)**

A general course in Shakespeare's plays.

**ENG 324.3
Early Modern Drama
1/2(3L)**

A study of English drama, 1580-1640, including such playwrights as Marlowe, Kyd, Shakespeare, Jonson, Dekker, Middleton, and Ford. The course will investigate the philosophies, techniques, power and popularity associated with Tudor, Stuart, and Caroline plays.

**ENG 325.6
17th-Century Literature
1&2(3L)**

A study of English literature of the 17th century, including the poetry of Donne, Jonson, Herbert, Marvell, and especially the works of Milton.

**ENG 327.3
English Drama, 1660-1737
1/2(3L)**

A study of the drama of the Restoration and the 18th Century, emphasizing the comedy of manners, but also dealing with dramatic genres particular to the period.

**ENG 328.6
The Literature of the Restoration and
18th Century
1&2(3L)**

A study of the literature of England from 1660 to 1800, with emphasis upon major writers such as Dryden, Swift, Pope, Gray, Fielding, Johnson, Boswell, and Burke.

**ENG 329.3
Life Writing by British Authors, 1780
to 1900
1/2(3L)**

An introduction to the variety of life writing produced by English-speaking countries between 1780 and 1900. "Life Writing" is

an inclusive term that includes many different kinds of writing about the self: not only autobiography but also the diary, the "confession," the travel narrative, the fictionalized life, the personal letter, and the slave narrative.

**ENG 331.6
Poetry and Prose of the Romantic
Period
1&2(3L)**

A study of British literature from 1780 to 1830, examining the nature of romanticism and the usefulness of the term "romantic," and emphasizing the works of such writers as William Wordsworth, Mary Shelley, and William Hazlitt.

**ENG 332.3
Gothic Narrative
1/2(3L)**

This course will trace the Gothic mode, in its various forms, from its origins in Britain in the 1760s through its assimilation into mainstream literature in the nineteenth century and beyond.

**ENG 334.6
Prose and Poetry of the Victorian
Period
1&2(3L)**

A study of the period 1830-1890, with emphasis on such prose writers as Carlyle, J. S. Mill, Newman, Huxley, Arnold and Pater, and such poets as Tennyson, the Brownings, Arnold, the Pre-Raphaelites, and Hopkins.

**ENG 339.6
Modern Irish Literature
1&2(3L)**

A study of 20th-century Anglo-Irish prose, poetry, and drama, usually including such writers as James Joyce, Frank O'Connor, W. B. Yeats, Seamus Heaney, John Synge, and Sean O'Casey.

**ENG 340.6
20th-Century British Poetry and
Prose
1&2(3L)**

A study of major 20th-century British poets and writers of prose, including for example, Yeats, Eliot, Thomas, Hopkins, Auden, Joyce, Conrad, and Lawrence.

**ENG 350.6
Commonwealth Literature
1&2(3L)**

A study of selected colonial and post-colonial literatures in English from Africa, south-east Asia, the West Indies, and the Antipodes.

**ENG 351.6
Canadian Poetry in English
1&2(3L)**

A survey of the development of Canadian poetry in English from the end of the 18th century to the present, with emphasis on the 20th century. Typically the class would study such poets as Isabella Valancy Crawford, D. C. Scott, E. J. Pratt, Dorothy Livesay, Earle Birney, and Michael Ondaatje. *Note:* Students with credit for ENG 353 may not take this course for credit.

**ENG 352.6
Canadian Fiction in English
1&2(3L)**

A survey of the development of Canadian fiction in English from the end of the 18th

century to the present, with emphasis on the 20th century. Some non-fictional prose will also be considered.

Note: Students with credit for ENG 353 may not take this course for credit.

**ENG 353.6
Canadian Literature in English
1&2(3L)**

A survey of English-Canadian literature (principally poetry and fiction), with emphasis on the 20th century.

Note: Students with credit for ENG 351 or 352 may not take this course for credit.

**ENG 354.6
American Literature to the Civil War
1&2(3L)**

While earlier writers will be studied in sufficient depth to provide necessary background and continuity, the course will concentrate on the works of such writers as Irving, Cooper, Poe, Emerson, Thoreau, Hawthorne, Melville, Whitman, and Dickinson.

**ENG 355.6
American Poetry and Prose from the
Civil War to the Great Depression
1&2(3L)**

A survey of such prose writers as Samuel Clemens, W. D. Howells, Henry James, and Ernest Hemingway, and such poets as Robert Frost, Wallace Stevens, W. C. Williams, Ezra Pound, and E. E. Cummings.

**ENG 356.6
American Poetry and Prose During
and Since the Great Depression
1&2(3L)**

A study of prose and poetry from 1930 to today by such writers as William Faulkner, John Steinbeck, Bernard Malamud, and Robinson Jeffers.

**ENG 358.3
Canadian Drama in English
1/2(3L)**

The development of Canadian drama in English, with emphasis on the period since 1960.

**ENG 359.3
Western Canadian Literature
1/2(3L)**

A study of literature in English, especially fiction, poetry, and drama, produced on the Canadian prairies.

**ENG 365.6
Creative Writing
1&2(2L)**

Intended for students who are seriously interested in the practice of imaginative writing (fiction, poetry, etc.). Course work will include an assignment of writing each week. Enrollment will be limited. Interested students should (a) obtain an application form from the English Department general office, Arts 320, and (b) register in an alternate class until final selection of the class has been completed.

**ENG 366.3
Advanced Creative Writing: Fiction
1/2(3L)**

Prerequisite(s): Evidence of practice and skill in the writing of creative prose as determined by the instructor.

Intended for students who have acquired some practice and skill in the writing of prose.

Interested students should (a) obtain an application form from the English Department general office, Arts 320, and (b) register in an alternate class until final selection of the class has been completed.

**ENG 367.3
Advanced Creative Writing: Poetry
1/2(3L)**

Prerequisite(s): Evidence of practice and skill in the writing of creative poetry as determined by the instructor.

Intended for students who have acquired some practice and skill in the writing of poetry. Interested students should (a) obtain an application form from the English Department general office, Arts 320, and (b) register in an alternate class until final selection of the class has been completed.

**ENG 370.6
English Biography and Autobiography
1&2(3L)**

A study of the development of the genre from its earliest appearance in the Middle Ages to the present.

**ENG 372.3
Utopian Literature in English
1/2(3L)**

A literary and cultural survey of utopias in English, with emphasis on 19th- and 20th-century examples from British and American literature.

**ENG 373.6
English Fiction to 1800
1&2(3L)**

A study of various types of prose fiction from early romances, travel tales, rogue biographies, and so on, to Defoe and the rise and development of the novel in England. Particular emphasis will be given to the major novels and novelists of the 18th century.

**ENG 374.6
The English Novel in the 19th Century
1&2(3L)**

A study of the English novel from Jane Austen to Hardy, with particular concentration on the great Victorians - Dickens, Thackeray, the Bronte sisters, George Eliot, and Hardy.

**ENG 375.6
The English Novel in the 20th Century
1&2(3L)**

A study of representative English novelists of the 20th century, including, for example, Conrad, Joyce, Lawrence, Golding, Woolf, and Greene.

**ENG 378.6
English Satire
1&2(3L)**

A study of selected satire in English.

**ENG 380.6
Modern Drama, Primarily British and American
1&2(3L)**

A study of modern British and American drama and the influences on it, including such dramatists as Ibsen, Shaw, Brecht, Pinter, Churchill, O'Neill, and Mamet.

**ENG 384.3
Beowulf and Tales of Northern
Heroes
1/2(3L)**

A study of Beowulf in Modern English Translation, including extensive consideration of its cultural and literary backgrounds, and readings in related or pertinent heroic narratives, primarily of North Germanic origin.

**ENG 385.6
19th- and 20th-Century European
Literature in Translation
1&2(3L)**

Prerequisite(s): 6 credit units junior English or LIT 100.6.

A study of 19th- and 20th-century European literature in translation with an emphasis upon major works that have influenced English and American literature.

**ENG 386.3
Courtly Love and the Family in the
Middle Ages
1/2(3L)**

An examination of romantic love, chivalry, and the family during the Middle Ages. The course will focus on a number of medieval romances, but will also cover many areas of women's cultural expression, including musical composition and mystical visions, and the tensions between the various forms of medieval women's experience and models of clerical authority.

**ENG 387.3
Fantasy
1/2(3L)**

A history of fantasy in English literature from early times to the present. Emphasis will be placed on modern works of fantasy.

**ENG 388.3 (Formerly 298)
Introduction to Film
1/2(2L-2P)**

A brief introduction to film aesthetics and history.

Note: Students with credit for ENG 298 prior to 1999-2000 may not take this course for credit.

**ENG 389.3
English Structural Linguistics
1/2(3L)**

Prerequisite(s): 6 credit units junior English, or LING 111, or a senior course in a language.

The theory and practical applications of structural and transformational grammar and rhetorics.

**ENG 390.6
An Introduction to English Linguistics
and the History of the English
Language
1&2(3L)**

Prerequisite(s): ENG 110 or equivalent, or LING 111 or 112, or a senior course in a language.

An introduction to English linguistics with special attention to the history of the English language, its Germanic origins, and its development as a world language.

**ENG 392.3
The Semantics of English
1/2(3L)**

Prerequisite(s): ENG 110 or equivalent, or

LING 111, or a senior course in a language. Semantics explains the ways in which we find language meaningful, and why misunderstanding these ways confuses and frustrates us. Deals with the semantics for English proposed by A. B. Johnson, C. S. Peirce, Alfred Korzybski, and others, and applications of their proposals to understanding literature, advertising, and propaganda.

HONOURS SEMINARS

Seminars are open to students who have been admitted to a single or double Honours program of studies. Other students may be admitted as space permits after consultation with the Department's Administrative Assistant and the Instructor of the class. The content of courses will change from year to year. The topics and texts covered in any particular term will be announced before the deadline for registration. Please seek academic counselling through the General Office, 320, Arts Building.

**ENG 401.6 Studies in Anglo-Saxon
and Medieval Literature**

**ENG 402.3 Topics in Anglo-Saxon
and Medieval Literature**

**ENG 403.6 Studies in 16th-Century
Literature in English**

**ENG 404.3 Topics in 16th-Century
Literature in English**

**ENG 405.6 Studies in 17th-Century
Literature in English**

**ENG 406.3 Topics in 17th-Century
Literature in English**

**ENG 409.6 Studies in 18th-Century
British Literature**

**ENG 410.3 Topics in 18th-Century
British Literature**

**ENG 413.6 Studies in 19th-Century
British Literature**

**ENG 414.3 Topics in 19th-Century
British Literature**

**ENG 415.6 Studies in 19th-Century
American Literature**

**ENG 416.3 Topics in 19th-Century
American Literature**

**ENG 418.3 Topics in 19th-Century
Canadian Literature**

**ENG 443.6 Studies in Commonwealth
and Post-Colonial Literature**

**ENG 444.3 Topics in Commonwealth
and Post-Colonial Literature**

**ENG 445.6 Studies in Genres and
Contexts of Literature: Modern**

**ENG 446.3 Topics in Genres and
Contexts of Literature: Modern**

**ENG 461.6 Studies in 20th-Century
British Literature**

**ENG 462.3 Topics in 20th-Century
British Literature**

**ENG 463.6 Studies in 20th-Century
American Literature**

**ENG 464.3 Topics in 20th-Century
American Literature**

**ENG 465.6 Studies in 20th-Century
Canadian Literature**

**ENG 466.3 Topics in 20th-Century
Canadian Literature**

**ENG 467.6 Studies in 20th-Century
Irish Literature**

**ENG 468.3 Topics in 20th-Century
Irish Literature**

**ENG 483.6 Studies in Women's
Literature**

**ENG 484.3 Topics in Women's
Literature**

**ENG 485.6 Studies in Critical
Approaches to Literature**

**ENG 486.3 Topics in Critical
Approaches to Literature**

**ENG 487.6 Studies in Genres and
Contexts of Literature**

**ENG 488.3 Topics in Genres and
Contexts of Literature**

**ENG 493.6 Studies in Language and
Linguistics**

**ENG 494.3 Topics in Language and
Linguistics**

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

- ENG 298.3 1/2(3L)
- ENG 299.6 1&2(3L)
- ENG 398.3 1/2(3S)
- ENG 399.6 1&2(3S)
- ENG 498.3 1/2(3S)
- ENG 499.6 1&2(3S)

GRADUATE COURSES

Department of English, College of Graduate Studies & Research

**ENG 801.3
An Introduction to Textual
Scholarship
1/2(2S)**

An introduction to textual authority, including the study of bibliographic description, editorial technique, textual transmission, database searches, and the history of modes of publication.

**ENG 802.6
Studies in Literary and Cultural
History
1&2(2S)**

Studies of specific literary periods, literary movements, issues of influence, reputation or reception. Theories of literary history may also be studied.

**ENG 803.3
Topics in Literary and Cultural
History
1/2(2S)**

Particular topics in the study of periods, movements, issues of influence, reputation or reception. Theories of literary history may also be studied.

ENG 804.6
Studies in Individual Authors
1&2(2S)

Studies in an author or selected authors writing in English.

ENG 805.3
Topics in Individual Authors
1/2(2S)

Particular topics in the work of an author writing in English, or on particular works in the author's *oeuvre*.

ENG 810.6
Studies in National and Regional Literatures
1&2(2S)

Studies in national and regional literatures (Canadian, American, English, Irish, etc.) and other constructions of nationality (postcolonial, aboriginal, ethnic, etc.).

ENG 811.3
Topics in National and Regional Literatures
1/2(2S)

Particular topics in national and regional literatures and constructions of nationality.

ENG 816.6
Studies in Literary and Cultural Theory
1&2(2S)

Studies in selected literary and/or cultural theories, from Plato to the present.

ENG 817.3
Topics in Literary and Cultural Theory
1/2(2S)

Particular topics and issues in selected theories, or on particular theorists.

ENG 818.6
Studies in Methods and Texts
1&2(2S)

Studies in the application of selected methods in the practical criticism of selected texts.

ENG 819.3
Topics in Methods and Texts
1/2(2S)

Particular topics and issues in the application of selected methods to selected texts.

ENG 842.6
Studies in Genres and Contexts
1&2(2S)

Studies in traditional or emerging genres of writing, and in their intertextual, disciplinary, and extraliterary contexts.

ENG 843.3
Topics in Genres and Contexts
1/2(2S)

Particular topics and issues in traditional or emerging genres of writing, and in their intertextual, disciplinary and extraliterary contexts.

ENG 898.3/899.6
Special Topics
1/2(2S), 1&2(2S)**ENG 994**
Research

Students writing a Master's thesis must register for this course.

ENG 996
Research

Students writing a Ph.D. thesis must register for this course.

ENVIRONMENTAL ENGINEERING**GRADUATE COURSES**

College of Graduate Studies & Research

ENV E 710
Environmental Issues and Law
1/2(3L)

Prerequisite: Registration in a Graduate Studies Program.

Designed for graduate students particularly in the areas of Engineering, Agriculture, Resources and Environmental Studies with no legal background. This course explores the legal aspects of environmental protection, environmental offences, constitutional law, environmental impact assessment, environmental audit and professional responsibility in relation to environmental advice and decision-making.

ENV E 898.3
Special Topics
1/2(3L)

Two 3 credit courses can be taken independently. Topics will be selected according to the student's specific area of interest.

ENV E 990
Seminar

A seminar is held each week throughout the regular session during which students, staff, and invited speakers discuss current research topics. Students are required to attend and to present at least one seminar each academic term.

ENV E 992.6
Project

Students taking the non-thesis Master's degree must register in this course.

ENV E 994
Research

Students writing a Master's thesis must register in this course.

ENV E 996
Research

Students writing a Ph.D. thesis must register in this course.

EXTENSION

Division of Extension

EXT 305.3
Developing Effective Extension Programs
1(3L)

Prerequisite: Completion of 60 credit units of university course work.

Provides an introduction to extension programming in which students will acquire the knowledge and develop the skills and abilities to plan and design effective extension programs, training programs, technology transfer programs and marketing / information programs in both the public and private sectors.

EXT 405.3
Advanced Extension Techniques and Methods (Not offered in 2002-2003)
(3L)

Prerequisite: Completion of EXT 305.3 Developing Effective Extension Programs.

The course will address in detail the various methods, program designs, and instructional techniques and strategies that can be employed to deliver extension and training programs to meet the needs of a client group and the intended outcomes designed for the program.

FAMILY MEDICINE

Department of Family Medicine, College of Medicine

These courses are restricted to students enrolled in the College of Medicine.

FAMED 503.6
Family Medicine/Emergency
PD (C) 8 weeks

Clerkship students will participate in a six-week primary outpatient-based experience. The students will do two weeks in one of the Family Medicine Teaching Units and four weeks in a rural or remote location. The four principles of Family Medicine will be stressed. The Family Medicine clerkship will provide exposure to the full spectrum of early undifferentiated health problems commonly encountered in the community setting. Clerkship students will also have a two-week rotation in an Emergency Department.

FINANCE

Department of Finance and Management Science, College of Commerce

See also Finance courses listed under Commerce in this section of the *Calendar*.

FIN 400.6
Honours Seminar in Finance
1&2(3S)

Prerequisite(s): Admission to the Honours program.

Directed readings and individual research in the area of Finance. The major course requirement involves the preparation of an Honours research paper under the supervision of one or more faculty (Honours Advisors) in the particular area of specialization. The Honours paper is normally presented at a department seminar.

FINE ARTS

College of Education

FINAR 100.6
An Introduction to the Fine Arts
1&2(3L-6P)

Consists of four Fine Arts components – music, dance, art and drama. Covers the introduction, appreciation, and understanding of the basics of each discipline through lectures and practical exercises.

FOOD SCIENCE

Department of Applied Microbiology and Food Science, College of Agriculture

B.Sc. programs are available through both the College of Agriculture and the College of Arts & Science. See college sections for details.

Students in the College of Arts & Science may take most FD SC courses for credit towards a B.A. or B.Sc. degree. For details see Food Science in the College of Arts & Science section.

FD SC 323.3
Food Additives and Toxicants
2(3L)

Introduction to the types of food additives currently used in the food industry and the function of these chemical compounds in foods will be presented. The safety of these additives and toxicological information will be discussed. The question of the addition of additives to foods versus 'natural' foods will be discussed, emphasizing the types and concentrations of 'natural toxicants' in foods.

FD SC 345.3
Food Processing I
2(3L-1P)

The fundamental principles of the common unit operations of food processing and preservation are discussed with emphasis on freezing, drying, evaporation and thermal processing operations. The operating principles of equipment utilized in these operations will be examined and selected processes of unit operations studied in detail.

FD SC 412.3
Fluid Food Products
1(3L-1P)

Introduction to the production and processing of milk, alcoholic beverages, carbonated and non-carbonated drinks, and other fluid food products.

FD SC 415.3
Advanced Food Chemistry
1(3L-4P)

Prerequisite(s): BIOCH 211.

Advanced study of chemical components in foods and of chemical reactions involving these components. Topics include carbohydrates, lipids, pigments, emulsions/emulsifiers, enzymes and browning reactions.

**FD SC 417.3
Food Analysis
1(3L-4P)**

Prerequisite(s): BIOCH 211 or CHEM 251.
Modern analytical techniques/instruments and their application to food analysis are presented and discussed. Basic principles, methodology, applications, sampling, accuracy and precision are discussed.

**FD SC 452.3
Quality Assurance for the Food Industry
1(3L)**

Principles of quality assurance as applied to the food industry. Topics include food regulations, analytical concerns, statistical quality control, sanitation, and the Hazard Analysis Critical Control Point (HACCP) quality assurance system.

**FD SC 457.3
Food Processing II
1(3L-3P)**

Fundamentals of Meat Science, including chemistry, processing and storage will be presented. The lipid component of foods will be discussed including a review of lipid chemistry, processing of fats and oils, and functional properties.

**FD SC 490.0
Honours Seminar
1&2(1S)**

Students in the Honours program are required to present one departmental seminar and attend all seminars.

**FD SC 491.3
Research Project
1/2(3P)**

Prerequisite(s): Registration in Honours with a minimum cumulative percentage average of 70% in food science courses, and written permission of the Department of Applied Microbiology and Food Science.

A research project is selected in consultation with a faculty supervisor in whose laboratory the work will be carried out. The student will: a) become familiar with scientific literature pertinent to the project, b) plan and set up procedures, and collect, record and analyze results, c) submit to the department a typed report incorporating a review of literature, procedures used, results obtained and a discussion of the results and their significance.

SPECIAL TOPICS

These courses are offered occasionally in special situations. Students interested in such opportunities should contact the department for information on offerings.

FD SC 398.3

FD SC 498.3

GRADUATE COURSES

Department of Food Sciences, College of Graduate Studies

**FD SC 812.3
Fluid Food Products
1(3L)**

Designed to introduce students to the production and processing of milk, alcoholic beverages, soft drinks and other fluid food products.

**FD SC 817.3
Advanced Techniques in Food Science
1(3L-3P)**

Prerequisite(s): BIOCH 220 (or 203); or permission of the instructor.

Modern analytical techniques and instruments for routine analysis and research on food products. Basic principles, analytical methods, applications, precision and sampling problems are discussed. Seminar and written assignments on current topics.

**FD SC 830.3
Processing of Oilseeds and Legumes
2(3L-4P)**

Prerequisite(s): BIOCH 220 (or 203) or PL SC 420; or permission of the instructor.

A detailed study of the structure, composition and processing of the principal oilseeds and legumes. Refining and utilization of the food, feed and industrial products will be discussed. Techniques for the component extraction of oil, protein, starch and fiber will be demonstrated in the pilot plant.

**FD SC 840.3
Carbohydrates in Foods and Their Functional Properties
2(3L)**

The physical and chemical characteristics of carbohydrates of plant origin will be discussed; their functional properties and interactions with other food components will be emphasized.

**FD SC 898.3/899.6
Special Topics
1&2(R/T/P)**

Assigned reading, tutorials and laboratory techniques in special areas related to the student's major field of interest. Students will be required to prepare reviews or seminars in specific topics.

**FD SC 990
Seminar**

Current literature in the field of Food Science is reviewed and discussed. Staff and students present papers on current research topics. Graduate students are required to attend and participate.

**FD SC 992.6
Project**

Students registering for the project Master of Agriculture degree must register in this course.

**FD SC 994
Research**

Students writing a Master's thesis must register for this course.

**FD SC 996
Research**

Students writing a Ph.D. thesis must register for this course.

FRENCH

Department of Languages and Linguistics, College of Arts & Science.

Students registered in any of the language courses (103, 106, 121, 122, 125, 212, 215) should plan to attend weekly oral

tutorials as scheduled in the *Registration Guide*. A multi-media laboratory is also available on a library basis.

Students who have completed the Immersion program in French to Grade 12, the ACFG program in French, or the French program in a Designated School, must register in FR 128 and 218. Students having graduated from Grade 12 in an Immersion program will not be allowed to register in FR 121/122 or 125 for credit if it has been fewer than five years since their graduation. Students with credit for French 30 (Grade 12 Core French) must take FR 121/122, 125. Students with an additional background in French beyond the Grade 12 level should consult the Department before registering.

Note: Students taking acceptable immersion French language courses will receive transfer credit for "unspecified" junior or senior French which may be used to satisfy Requirement 7 only.

**FR 103.3
Beginning French I
1/2(4L-1T)**

An introduction to the basic grammatical concepts of French. Instruction will be based on the communicative approach.

Note: Students with credit for French 20 (Grade 11 French) in the past five years cannot take this course for credit. Students with credit for French 30 (Grade 12 French), regardless of how long ago it was taken, cannot take this course for credit. FR 103 does not count towards a major in French. This course can be used towards the humanities or languages requirement.

**FR 106.3
Beginning French II
1/2(4L-1T)**

Prerequisite(s): French 20 or FR 103.

A continuation of the basic grammatical concepts of French. The communicative approach will be used with greater emphasis on reading and writing.

Note: Students who have completed French 30 in the past five years, cannot take this course for credit. FR 106 does not count towards a major in French. This course can be used towards the humanities or languages requirement.

FR 120.6 has been split into FR 121.3/122.3 and 125.3.

**FR 121.3 (Formerly 120)
Intermediate French 1A
1/2(4L-1T)**

Prerequisite(s): French 30 (Grade 12 Core French) or FR 106.

For students requiring a detailed review of the basic grammatical concepts of French. Practice in aural comprehension, speaking, and writing; an introduction to reading. The course meets four hours a week, and students also attend a laboratory/conversation tutorial one hour a week.

Note: Students with French 30 or FR 106 must register in either FR 121 or 122. It is recommended that students with grades below 80 per cent in French 30 or FR 106 register in FR 121. Students having graduated from Grade 12 in an Immersion

program, as well as students with an additional background in French beyond the Grade 12 level, will not be allowed to register in FR 121 for credit if it has been fewer than five years since their graduation.

**FR 122.3 (Formerly 120)
Intermediate French 1B
1/2(3L-1T)**

Prerequisite(s): French 30 (Grade 12 Core French) or FR 106.

For students who have an adequate mastery of the basic grammatical concepts of French. Practice in aural comprehension, speaking and writing, and an introduction to reading. The course meets three hours a week, and students also attend a laboratory/conversation tutorial for an additional hour per week.

Note: Students with French 30 or FR 106 must register in either FR 121 or 122. It is recommended that students with grades above 80 per cent in French 30 or FR 106 register in FR 122. Students having graduated from Grade 12 in an Immersion program, as well as students with an additional background in French beyond the Grade 12 level, will not be allowed to register in FR 122 for credit if it has been fewer than five years since their graduation.

**FR 125.3 (Formerly 120)
Intermediate French 2
1/2(3L-1T)**

Prerequisite(s): FR 121 or 122.

A continuation of the language study done in FR 121 or 122, with more emphasis on reading. Students will attend a laboratory/conversation tutorial one hour a week in addition to three hours of classes.

Note: Students having graduated from Grade 12 in an Immersion program will not be allowed to register in FR 125 for credit if it has been fewer than five years since their graduation. Students with an additional background in French beyond the Grade 12 level should consult the Department before registering.

**FR 128.3 (Formerly 200)
Intermediate French for Bilingual Students
1/2(3L-1T)**

Prerequisite(s): Ecole fransaskoise Grade 12, designated (or immersion) school Grade 12, out-of-province equivalent Grade 12. (If it has been more than five years since graduation from these programs, students may take 121 [or 122] and 125).

Designed to help students with a well-developed pre-university training in oral French, strengthen and raise their overall, but especially written, performance, through grammar review, précis of short documentary videos, and a critique of a choice of articles.

Note: Students with credit for Fr 121 (or 122), or 125 may not take this course for credit.

**FR 181.3 (Formerly 107)
Introduction to the Literature of the Francophone World (in English)
1/2(3L)**

An introduction in English to the literature of the Francophone world, using three or four major works in translation as the basis of study. Deals with the literature of France as well as literature in French in other

European countries, Africa, the Caribbean and Canada.

Note: This course cannot be used as part of a French major. It can be used by non-French majors towards the humanities requirements. French majors may use it under Requirement 7.

**FR 186.3 (Formerly 108)
Culture and Civilization of Francophone Countries (in English)
1/2(3L)**

Examines, in English, some of the underlying myths of French and Quebec culture and civilization. Considers the acculturation of certain French myths in the former French colonies of Africa, Asia and the South Pacific.

Note: This course cannot be used as part of a French major. It can be used by non-French majors towards the humanities requirements. French majors may use it under Requirement 7.

**FR 212.3 (Formerly 202)
Advanced French I
1/2(3L-1T)**

Prerequisite(s): FR 125.

A French language course that builds on skills acquired in FR 121, 122, 125 or equivalent. Some oral work, but emphasis is placed on the practical application of grammar through reading and writing. A contemporary register of language, vocabulary and style is stressed through the study of magazines, journals and newspapers.

**FR 215.3 (Formerly 202)
Advanced French II
1/2(3L-1T)**

Prerequisite(s): FR 212.

A French language course that builds on skills acquired in FR 212 or equivalent. Some oral work, but emphasis placed on the practical application of grammar through reading and writing. A fairly formal register of language, vocabulary and style is stressed through the study of literary and para-literary material.

**FR 218.3 (Formerly 200)
Advanced French for Bilingual Students
1/2(3L)**

Prerequisite(s): FR 128.

This course completes the grammar review started in FR 128.3, and enhances writing skills through intensive vocabulary exercises, précis of and commentary on longer documentary videos and a critique of a Québécois novel.

Note: Students with credit for FR 125, 202, 212 or 215 may not take this course for credit.

**FR 220.3 (Formerly 210)
Masterpieces of French Literature
1/2(3L)**

Prerequisite(s): FR 125 or 218 (may be taken concurrently); or equivalent.

An introduction to literary studies in French. The course will combine two elements: how to approach a French literary text, and a general introduction to French literature. It will study a selected number of French authors from the different genres and the various periods of French literature.

Note: Students with credit for FR 210 may not take this course for credit.

**FR 230.3 (Formerly 213)
Introduction to French-Canadian Literature
1/2(3L)**

Prerequisite(s): FR 125 or 218 (may be taken concurrently); or equivalent.

An introduction to the literature of 20th-century French Canada. A study of the main literary genres – short story, novel, plays, poetry and poetic prose – in their relationship to everyday life.

Note: Students with credit for FR 213 may not take this course for credit.

**FR 251.3
French Civilization Through the Ages
1/2(3L)**

Prerequisite(s): FR 121 (or 122) and 125; or equivalent.

Characterizes the historical periods of France from the Middle Ages to the 20th century and studies the arts (painting, architecture and music) through selected artists and works.

**FR 252.3
France Today
1/2(3L)**

Prerequisite(s): FR 121 (or 122) and 125; or equivalent.

A study of present-day France: the geography, recent history, everyday life, political and economic life, problems and concerns, cultural activities, attitudes, and the changes occurring.

**FR 258.3
French for Business
1/2(3L)**

Prerequisite(s): FR 125 or 218 (may be taken concurrently).

An intermediate course in business French, introducing topics such as big and small business, banks, international business as well as material on résumés, letters and job interviews and basic information on computers and the Internet, focussing on both Canada and France.

**FR 261.0
Revolution and Dissidence: Studies in Protest Literature
1/2(1T)**

Prerequisite(s): FR 125 or 218 (may be taken concurrently).

A tutorial accompanying LIT 261.

**FR 262.0
Exiles and Emigrés: Studies in Expatriation
1/2(1T)**

Prerequisite(s): FR 125 or 218 (may be taken concurrently).

A tutorial accompanying LIT 262.

**FR 263.0
Heroines, Anti-Heroines and Gender Definition in Literature
1/2(1T)**

Prerequisite(s): FR 125 or 218 (may be taken concurrently).

A tutorial accompanying LIT 263.

**FR 264.0
Mephisto and Faust: Knowledge, Power, Damnation and Redemption
1/2(1T)**

Prerequisite(s): FR 125 or 218 (may be taken concurrently).

A tutorial accompanying LIT 264.

**FR 271.3
French Canadian Civilization: Origins and Traditions
1/2(3L)**

Prerequisite(s): FR 121 (or 122) and 125; or equivalent.

Explores the presence of French civilization in North America from the 17th century to the industrial era as it is apparent in crafts, architecture, folklore, food, and local traditions.

**FR 272.3
French Canadian Contemporary Culture and Society
1/2(3L)**

Prerequisite(s): FR 121 (or 122) and 125; or equivalent.

Examines French Canadian civilization today as it is expressed through culture and society.

**FR 285.3 (Formerly 205)
20th-Century French Literature in Translation
1/2(3L)**

Prerequisite(s): Completion of 30 credit units at the university or ENG 110 or LIT 100.

A study of the 20th-century French novel, short story and drama as a means of expressing varied approaches to the basic problems of modern life.

Note: This course cannot be used as part of a French major. It can be used by non-French majors towards the humanities requirements. French majors may use it under Requirement 7.

**FR 303.3
History of the French Language
1/2(3L)**

Prerequisite(s): FR 128 and 218 or 212 and 215.

Describes and exemplifies the history of the dialects spoken in France from Roman times, especially the one which evolved into modern international French.

**FR 304.3
French Phonetics: Theory and Practice
1/2(3L-1P)**

Prerequisite(s): FR 128 and 218 or 212 and 215.

Conducted entirely in French, this course deals with the theory and practice of standard European and Canadian French pronunciation, corrective phonetics, phonetic transcription and the phenomena of elision, liaison, enchainment and syllabification.

**FR 308.3
Medieval French Literature
1/2(3L)**

Prerequisite(s): FR 220 or 230.

Introduction to the civilization of medieval France, as expressed in literary masterpieces of enduring value. Extracts of epics, romances, poems and plays are read in the original language and explained for their linguistic and stylistic relevance.

**FR 309.3
French Literature of the Renaissance
1/2(3L)**

Prerequisite(s): FR 220 or 230.

A study of the representative authors, works, and literary movements in French literature during the Renaissance.

**FR 312.3 (Formerly 302)
Advanced French Grammar
1/2(3L)**

Prerequisite(s): French 215 or 218

A study of French grammar at the advanced level based on grammatical analysis.

Note: Students with credit for FR 302 may not take this course for credit.

**FR 314.3
Introduction to Translation
1/2(3L)**

Prerequisite(s): 6 credit units in French at the 200 level. A grade of 70% or above is desirable.

An introduction to translation from French to English. A number of different kinds of texts (general, specialized, literary) will be translated, and various approaches to translation will be studied.

**FR 317.3
French Literature of the 17th Century
1/2(3L)**

Prerequisite(s): FR 220 or 230.

Representative authors, works, and literary movements will be studied.

**FR 318.3
French Literature of the 18th Century
1/2(3L)**

Prerequisite(s): FR 220 or 230.

A study of the writers of 18th-century France who were most influential in the development of the philosophe movement, with particular emphasis on Montesquieu, Voltaire, Diderot and Rousseau.

**FR 319.3
French Literature of the 19th Century
1/2(3L)**

Prerequisite(s): FR 220 or 230.

Representative authors, works, and literary movements will be studied.

**FR 320.3
French Literature of the 20th Century
1/2(3L)**

Prerequisite(s): FR 220 or 230.

Beginning with Proust, the course will cover major writers and literary movements in the novel, the theatre and poetry, but will concentrate on the novel at the beginning of the century, the literature of the absurd, and the nouveau-roman.

**FR 334.3
The Poetry of Quebec
1/2(3L)**

Prerequisite(s): FR 220 or 230.

A study of the development of poetry in Quebec: forms and main themes.

**FR 340.3
Black-African and Caribbean Literature in French
1/2(3L)**

Prerequisite(s): 6 credit units in French at the 200-level.

Novels, poetry, short stories and essays of French-speaking black Africa,

Madagascar and the Caribbean. Traditional African society and cultural and political problems of colonialism and de-colonization will be discussed as background to the literature.

**FR 343.3
The Novel in Quebec
1/2(3L)**

Prerequisite(s): FR 220 or 230.

Studies the development of the novel in Quebec with emphasis on contemporary works.

**FR 345.3
The Theatre in Quebec
1/2(3L)**

Prerequisite(s): FR 220 or 230.

Studies the development of theatre in French Canada with emphasis on the contemporary period.

**FR 350.3
Francophone Literature of the
Canadian West
1/2(3L)**

Prerequisite(s): FR 220 or 230.

A study of the Francophone literature of the Canadian West from 1870 to today. Covers major writers in the novel, poetry and theatre. Students will be made aware of the representative authors and their works produced in French on the Canadian prairies.

**FR 365.3
French Theatre in English Translation
1/2(1L)**

Prerequisite(s): A course in English or Literature; completion of 60 credit units at the university.

Representative French plays from the 17th century to the contemporary period, studied in their historical context as expressions of literary movements (e.g., Classicism, Romanticism, Theatre of the Absurd) and as types of theatre (e.g., farce, comedy, tragedy, historical drama). This will be offered as a guided reading course. The class will meet one hour every two weeks for a discussion session.

Note: May not be taken by students with credit for FR 265 or 495. This course cannot be used as part of a French major. It can be used by non-French majors towards the humanities requirements. French majors may use it under Requirement 7.

**FR 408.3
Special Topics in Medieval French
Literature
1/2(3L)**

Prerequisite(s): FR 220 or 230.

One special topic in medieval French literature will be studied such as lyric poetry or epic literature.

**FR 409.3
Special Topics in French
Renaissance Literature
1/2(3L)**

Prerequisite(s): FR 220 or 230.

One of the following special topics in French literature of the 16th century will be studied: Rabelais or Montaigne.

**FR 417.3
Special Topics in 17th-Century
French Literature
1/2(3L)**

Prerequisite(s): FR 220 or 230.

One of the following special topics will be studied: the theatre of Corneille and Racine, the novel (from Urfé to Lafayette), or secondary genres (fables, sermons, maxims, portraits, correspondence).

**FR 418.3
Special Topics in 18th-Century
French Literature
1/2(3L)**

Prerequisite(s): FR 220 or 230.

One of the following special topics will be studied: the novel and the theatre or the Encyclopédistes.

**FR 419.3
Special Topics in 19th-Century
French Literature
1/2(3L)**

Prerequisite(s): FR 220 or 230.

One of the following topics will be studied: French symbolist poetry (Baudelaire, Verlaine, Rimbaud and Mallarmé); "Victor Hugo cet Inconnu"; The "arriviste" in Stendhal's, Balzac's and Maupassant's novels; The superfluous man in the 19th-century French novel (Constant, Adolphe, Chateaubriand, René, Flaubert, L'Education sentimentale).

**FR 420.3
Special Topics in 20th-Century
French Literature
1/2(3L)**

Prerequisite(s): FR 220 or 230.

One of the following topics will be studied: The Nouveau-roman; Dada and Surrealism in French literature; the literature of the absurd.

**FR 423.3
Literature and Spirituality: The
Catholic Novel in France
1/2(3L)**

Prerequisite(s): FR 220 or 230.

A study of the three major "Catholic" novelists of 20th-century France: François Mauriac, Julien Green, and Georges Bernanos. Emphasis will be placed upon their religious and spiritual preoccupations.

**FR 434.3
Special Topics in French Canadian
Poetry
1/2(3L)**

Prerequisite(s): FR 220 or 230.

A special topic in French Canadian poetry will be studied, such as surrealism, women writers, modernism/post-modernism.

**FR 436.3
Selected Topics in French
1/2(2 Weekends)**

Prerequisite(s): FR 215 or 218 and 6 senior credit units in French or French Canadian literature.

This course is offered in collaboration with the University of Regina and taught jointly by faculty members from both campuses. It may, for example, be given over two weekends, one in Saskatoon and one in Regina, on two related topics in areas such as literature, civilization, cinema, and translation. Or distance technology could be used. The topics change every year.

**FR 438.3 Special Studies in French
1/2(IS)**

Prerequisite(s): FR 215 or 218 and 6 senior credit units in French literature and/or civilization and/or linguistics.

Independent study, under the direction of a faculty member, of a topic in French or French Canadian literature or civilization or linguistics that is not covered in any of the existing courses in the department.

**FR 443.3
Special Topics in the French
Canadian Novel
1/2(3L)**

Prerequisite(s): FR 213.

A special topic in the French Canadian novel will be studied, such as one of the women writers, the social novel or the nouveau-roman.

**FR 445.3
Special Topics in French Canadian
Theatre
1/2(3L)**

Prerequisite(s): FR 220 or 230.

A special topic in French Canadian drama will be studied, such as women writers, a period or author, or the application of a particular theoretical approach to the study of theatrical texts.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

FR 298.3 1/2(3L)

FR 299.6 1&2(3L)

FR 498.3 1/2(3S)

FR 499.6 1&2(3S)

GRADUATE COURSES

Department of Languages and Linguistics,
College of Graduate Studies & Research

**FR 808.3
Advanced Studies in the Literature of
Medieval France
1/2(3L)**

Prerequisite(s): FR 308; or equivalent.

In a given year, one special topic in medieval or Renaissance French and Provençal literature will be studied, such as the epic, drama, poetry, verse-novels, the Graal-cycle, (pre-)humanistic translations, or non-literature texts, with special emphasis on the manuscripts transmission and editorial principles.

**FR 814.6
French Literature of the Second Half
of the 19th Century
1&2(3L)**

Literary movements including Le Parnasse, symbolism, realism, naturalism. Poets studied include Hugo, Leconte de Lisle, Hérédia, Baudelaire, Rimbaud, Mallarmé. Novelists studied include Flaubert, Zola, Maupassant, Daudet.

**FR 815.6
French Poetry
1&2(3L)**

A study of French poetry from the medieval period to the present.

**FR 817.3
Advanced Studies in 17th-Century
French Literature
1/2(3L)**

Prerequisite(s): Admission to graduate studies in french.

In a given year, a special topic in French literature of the 17th century will be studied, e.g., the theatre of Corneille and Racine; the novel; secondary genres (fables, sermons, maxims, portraits, correspondence).

**FR 818.3
Advanced Studies in 18th-Century
French Literature
1/2(3L)**

Prerequisite(s): Admission to graduate studies in French.

In a given year, a special topic in French literature of the 18th century will be studied, e.g., novel, theatre, Encyclopédistes, etc.

**FR 819.3
Advanced Studies in 19th-Century
French Literature
1/2(3L)**

Prerequisite(s): Admission to graduate studies in french.

In a given year, a special topic in French literature of the 19th century will be studied, e.g., the second, disillusioned romantic generation (Flaubert, Baudelaire, Rimbaud and Mallarmé), which idolizes art, the antithesis of money.

**FR 820.3
Advanced Studies in French
Literature of the 20th Century
1/2(3L)**

Prerequisite(s): Admission to graduate studies in french.

One aspect of 20th-century literature will be studied in depth, for example, the absurd and engagement, 20th-century attempts at tragedy, Dada and Surrealism, the Nouveau-roman.

**FR 840.6
Seminar on a Special Subject of
French or French-Canadian
Literature
1&2(S)**

**FR 843.3
Advanced Studies in the Quebec
Novel
1/2(3L)**

Prerequisite(s): FR 343 and admission to graduate studies in french.

Advanced studies of a special topic in the Quebec novel, e.g., women writers, the social novel, the nouveau-roman, etc.

**FR 845.3
Advanced Studies in Quebec Modern
Drama
1/2(1.5L-1.5P)**

Prerequisite(s): FR 345 and admission to graduate studies in french.

Advanced studies in Quebec modern drama, theory and practice. In the lab, students will work under the direction of an experienced actor and stage director.

**FR 897.3
Selected Topics in French
1/2**

Prerequisites: FR 220 or FR 230 or equivalent, and 6 credit units of French or

French Canadian Literature at the 300- or 400- level.

This course is offered in collaboration with the University of Regina and taught jointly by faculty members from both campuses. It may, for example, be given over two weekends, one in Saskatoon and one in Regina, on two related topics in areas such as literature, civilization, cinema, and translation. Or distance technology may be used. The topics change every year.

FR 898.3/899.6
Special Topics
1/2(3R), 1&2(3R)

FR 994
Research

Students writing a Master's thesis must register for this course.

GENERAL BUSINESS

College of Commerce

G BUS 400.6
Honours Seminar in General Business
1&2(3S)

Prerequisite(s): Admission to the Honours program.

Directed readings and individual research in the areas of general business. The major course requirement involves the preparation of an Honours research paper under the supervision of one or more faculty (Honours Advisors) in the particular area of specialization. The Honours paper is normally presented at a department seminar.

GENERAL ENGINEERING

College of Engineering

G E 110.3
Engineering I
1(3L-3P)

An introduction to engineering to develop various problem solving approaches, skills and competencies used by engineers, including common computer applications, charts and graphs, documentation, and drawing and sketching to develop visualization skills.

G E 120.3
Engineering II
2(3L-3P)

Prerequisite(s): G E 110.

Further development of problem solving skills begun in G E 110. An introduction to modeling physical systems, with an emphasis on developing a relatively non-mathematical conceptual understanding of force, pressure, rates, flow, accumulation, etc. and their application in practical engineering situations. The fundamentals and application of linear algebra are the focus in the first half of the course. The types of activities included within the various engineering disciplines are discussed to illustrate the range of engineering activity. Examples of open-ended, discipline-specific problems are included in the lab component of the course.

G E 124.3
Engineering Mechanics I
1(3L-1P-2T)

Prerequisite(s): Physics 30.

Introduction to statics. This course provides a basic introduction to forces as vectors, force equilibrium of particles, and force and moment equilibrium of rigid bodies. Problems involving friction and the analyses of simple trusses, frames and machines are also introduced. A series of problem laboratories and practical laboratories are designed to help the student apply the principles of statics to practical problems.

G E 125.3
Engineering Mechanics II
2(3L-1P-2T)

Prerequisite(s): G E 124 and MATH 110.

Corequisite(s): MATH 124.

A continuation of Engineering Mechanics I. The equilibrium of bodies under distributed loads is presented as an introduction to centroids, centers of mass, and area moments of inertia. Particle dynamics is the subject of the majority of the course starting with the principles of particle translation under constant and non-constant acceleration. The kinetics of particles during translation, including force-acceleration, work-energy, and impulse-momentum are also applied to practical engineering applications. A series of problem laboratories and practical laboratories provide practical problems to assist in the assimilation of the principles covered.

G E 210.3
Probability and Statistics
1(3L-1.5P)

Prerequisite(s): A course in calculus (may be Calculus 30).

Introduces the student to the concepts of probability and statistics using examples from various fields of engineering.

G E 213.3
Mechanics of Materials
1/2 (3L-1.5P)

Prerequisite(s): G E 124 and G E 125 (taken).

Building upon the concepts introduced in the courses in statics and dynamics and the properties of engineering materials, this course will extend equilibrium analysis to deformable bodies. Emphasis will be placed on understanding and applying the three fundamental concepts of solid mechanics - equilibrium, constitutive relationships, and geometry of deformation (compatibility). The fundamentals will be introduced and reinforced in the context of specific behaviors, including axial tension and compression, pure bending, bending in combination with shear, and torsion of circular shafts. Transformation of stress in two dimensions will be introduced.

G E 226.3
Mechanics III
2(3L-1.5P)

Prerequisite(s): G E 125 and MATH 223 (taken).

A course in the mechanics (kinematics and kinetics) of plane motion. Velocity and acceleration for translational and rotational

motion are treated. The force-acceleration, impulse-momentum, and work-energy methods for systems undergoing two-dimensional dynamics are discussed in detail.

G E 300.3
Oral and Written Communication
1/2(3L)

Prerequisite(s): 45 credit units towards the B.E. degree.

The course introduces the study and practice of pragmatic communication, with a focus on the rhetorical foundations of technical communication. It is designed to teach students to read analytically, to evaluate the demands of audience, context, and purpose, and to write and present technical and other information clearly and comprehensively. It will also deal with the role of communicative competence in establishing professional credibility with clients, co-workers, and superiors. Students will prepare and present a variety of oral and written messages typical of those encountered in professional practice, including reports, résumés, and correspondence, and will be involved in the evaluation and critical appraisal of each other's work.

Note: Students with credit for G E 390 cannot take G E 300 for credit.

G E 348.3
Engineering Economics
1/2(3L-1.5P)

Prerequisite(s): 45 credit units of university study towards the B.E. degree.

An introduction to engineering economics and decision analysis. Topics include: Fundamental economic concepts, cost concepts, time value of money operations, comparison of alternatives, depreciation and income tax, economic analysis of projects in the public and private sectors; break-even analysis, sensitivity and risk analysis, decision models.

G E 400.3
Rhetoric: Theory and Practice of Persuasion
1/2(3L)

Prerequisite(s) and Corequisite(s): A previous course in any humanities discipline.

A broad survey of the ancient discipline of rhetoric as it is currently understood and practised. Consideration of the nature, tradition, and theory of rhetoric, with an emphasis on developing skill in the use and detection of rhetorical devices and strategies in oral and written discourse.

G E 449.3
Engineering in Society
1/2(3L)

Prerequisite(s): 90 credit units of university study towards the B.E. degree.

Corequisite(s): G E 300.

Designed to create an awareness of the diverse and often-contradictory impacts of science and technology on society. The consequences of current technological changes and those of the recent past are explored from a professional ethics point of view to illustrate the complexities of technological-societal interrelationships.

GEOGRAPHY

Department of Geography, College of Arts & Science

GEOG 101.3
Introduction to Global Environmental Systems: Atmosphere, Hydrosphere and Biosphere
1/2(3L)

A study of important elements of the global environment, emphasizing interactions between the atmosphere, soils and vegetation. Examines the global radiation and energy balance, global variations in temperature and precipitation, atmospheric and oceanic circulation, the hydrologic cycle, soil formation and fertility, and the distribution and composition of plant communities. Case studies are introduced to illustrate human impact on the environment.

Note: Follows the same lectures as GEOG 111, but without a laboratory component. Recommended for students who wish to satisfy the natural science requirement of Programs Type A, B, and D. Students with credit for GEOG 110 or 111 may not take this course for credit.

GEOG 102.3
Introduction to Global Environmental Systems: Landscapes of the Earth
1/2(3L)

A study of important elements of the global environment, emphasizing interactions between the atmosphere, lakes and oceans, and the earth's surface. Examines the processes operating beneath and at the earth's surface that shape the continents and ocean basins. Topics include plate tectonics, earthquake and volcanic activity, the hydrologic cycle, and the landforms created by the action of rivers, wind, glaciers, ground ice, and waves. Case studies are introduced to illustrate the impact of natural hazards on human populations.

Note: Follows the same lectures as GEOG 112, but without a laboratory component. Recommended for students who wish to satisfy the natural science requirement of Programs Type A, B, and D. Students with credit for GEOG 110 or 112 may not take this course for credit.

GEOG 111.3
Introduction to Global Environmental Systems: Atmosphere, Hydrosphere and Biosphere
1/2(3L-2P)

Follows the same lectures as GEOG 101, but with a laboratory component.

Note: Recommended for students who wish to satisfy the natural science requirement of Program Type C. Students with credit for GEOG 101 or 110 may not take this course for credit.

GEOG 112.3
Introduction to Global Environmental Systems: Landscapes of the Earth
1/2(3L-2P)

Follows the same lectures as GEOG 102, but with a laboratory component.

Note: Recommended for students who wish to satisfy the natural science requirement of Program Type C. Students with credit for

GEOG 102 or 110 may not take this course for credit.

**GEOG 113.3
Introduction to Economic Geography
1/2(3L-1T)**

An introduction to geography as a social science. A survey of the subfields of economic geography includes the location of social and economic activities in space, regional development, spatial diffusion, urban growth processes and spatial interaction, as applied to selected regional problems.

Note: Students with credit for GEOG 115 may not take this course for credit.

**GEOG 114.3
Introduction to Cultural Geography
1/2(3L-1T)**

Examines the distribution of human populations, the evolution of human societies, the behavioral norms or cultures of these societies, and the influence of culture in its various manifestations (language, religion, customs, politics, etc.) on the human landscape including settlement types, forms of agriculture and travel patterns.

Note: Students with credit for GEOG 115 may not take this course for credit.

**GEOG 201.3 (Formerly 301)
Regional Geography of Russia
1/2(3L)**

Prerequisite(s): 3 credit units of geography.

An appraisal of the physical environment, resource base, industrial development, agriculture, population and cultural characteristics of Russia using a regional approach. The regional breakdown will be based on the 20 official Economic Regions.

**GEOG 202.3
Regional Geography of Canada
1/2(3L)**

Prerequisite(s): 3 credit units in geography.

Presents an analysis of the evolution of Canada and describes the physical, historical, economic and cultural bases of the various regions of Canada.

**GEOG 203.3
Regional Geography of the United States
1/2(3L)**

Prerequisite(s): 3 credit units in geography.

The major geographic regions of the United States will be defined and the physical environment, the historical development, the economic activities and the settlement patterns will be analyzed.

**GEOG 204.3
Geography of the Prairie Region
1/2(3L)**

Prerequisite(s): 3 credit units in geography.

Presents an analysis of the physical, historical, economic and social geography of the three Prairie Provinces. The processes of settlement, resource development, and urban growth will be examined.

**GEOG 205.3
Regional Geography of Latin America
1/2(3L)**

Prerequisite(s): 3 credit units of geography.

A picture of the land, climates, peoples, politics, and economies of Latin America in terms of mappable regions of similarity.

**GEOG 207.3
Geography of Pacific Asia
1/2(3L)**

Prerequisite(s): 3 credit units in geography.

A systematic study of the geographical settings of Pacific Asia; analysis of the physical characteristics, population and spatial economy; and examination of selected countries and regions.

**GEOG 208.3 (Formerly 281)
World Regional Development
1/2(3L)**

Prerequisite(s): 3 credit units in social science or permission of the department.

The regions of the world face a series of development problems. These problems are examined in terms of development theory and their spatial consequence. Their implications for global, national and regional planning are discussed.

**GEOG 210.3
Environmental Study in Physical Geography
1/2(3L-2P)**

Prerequisite(s): 3 credit units in introductory natural sciences.

An overview of environmental study using physical geography as an integrative discipline. Includes assessment of human-environment interrelationships from the perspective of our current understanding of how Earth systems function.

Note: May be taken concurrently with upper level geography courses with permission of the department.

**GEOG 215.3
Human Geography and Global Change
1/2(3L-1T)**

Prerequisite(s): 3 credit units in a social science.

A systematic examination of the interrelationships between geography and global change. Geographic concepts and perspectives are used to better understand the rapidly changing economic, political, social, demographic and environmental processes in the world as it enters the 21st century.

Note: May be taken concurrently with upper-level geography courses with permission of the department.

**GEOG 219.3 (Formerly 263)
Introduction to Business Geography
1/2(3L-1P)**

Prerequisite(s): GEOG 113 or 114 or 215.

An introduction to a geographic perspective on businesses and the economy. Provides a broad overview of all sectors of the economy in addition to a focus on theories and methods in manufacturing location. Introduces the student to computer applications in location planning.

**GEOG 222.3
Introduction to Technical Geography
1/2(3L-3P)**

Prerequisite(s): 6 credit units of geography.

Introduction to the skills for reading maps, air photos and satellite images is provided, along with introduction to computer-based cartography, image analysis and enhancement, and geographic information systems (GIS).

**GEOG 225.3
Hydrology of Canada
1/2(3L)**

Prerequisite(s): GEOG 111 or 210 or GEOL 243 and 246.

The geographic distribution of hydrologic processes in Canada is outlined. The types of processes and their rates of operation are related to regional physical environments.

**GEOG 233.3
Introduction to Weather and Climate
1(3L-1T)**

Prerequisite(s): GEOG 111 or 210 or GEOL 206.

An examination of the elements of weather and climate including the composition and thermal structure of the atmosphere; radiation and energy balances; global circulation; air masses; fronts and atmospheric disturbances; and climates of the world.

**GEOG 235.3
Principles of Geomorphology
1(3L)**

Prerequisite(s): GEOG 112 or 210 or GEOL 121 or 122.

The description and objective classification of landforms and the processes and principles involved in their origin and distribution.

**GEOG 241.3
Population Geography
1/2(3L)**

Prerequisite(s): GEOG 113 or 114 or 215.

Examines the demography of human populations and their spatial patterns. Central themes are the evolving patterns of fertility, mortality, and migration, the processes that fashion these geographical distributions, and their impact upon population growth, demographic change and regional development.

**GEOG 246.3 (Formerly 256)
Urban Community Planning
1/2(3L)**

Prerequisite(s): GEOG 113 or 114 or 215.

Introduces the theory and methods of urban and regional planning. Three major topical areas are emphasized: the land use and social organization problems faced by urban places and planners; planning concepts, and their evolution and application; and the interrelationship between the role of the state, and urban or regional change.

**GEOG 247.3
Community Planning in Canada
1/2(3L)**

Prerequisite(s): GEOG 113 or 114 or 215.

Detailed investigation of community planning methodology and applications, with emphasis on population and housing analysis. The causes, impacts and proposed planning solutions for major

community planning problems in Canadian urban or rural areas are discussed. Computer applications and the use of statistical information in addressing problems of inner-city neighbourhoods in Saskatoon are stressed.

**GEOG 249.3
Introduction to Urban Geography:
Urban Systems
1/2(3L)**

Prerequisite(s): GEOG 113 or 114 or 215.

An introduction to the fundamental concepts of the urban system. The origins of cities, evolution of urbanization, classification of urban areas, urban hierarchies, core-periphery relationships and inter-urban movement of phenomena will be traced.

**GEOG 260.3
Political Geography
1/2(3L)**

Prerequisite(s): GEOG 113 or 114 or 215 or POLST 110.

An analysis of the theories and ideas concerning the relationship between geography and politics.

**GEOG 265.3
The Geography of Transportation
1/2(3L)**

Prerequisite(s): GEOG 113, 114 or 215.

Introduces the geographical aspects of transportation theory and planning. Major topical areas that are emphasized are: travel, behaviour, network design, and planning and policy for the future.

**GEOG 270.3
Principles of Biogeography
1/2(3L)**

Prerequisite(s): GEOG 111 or 210.

Focuses on the geography of plants including the environmental control of plant distributions; the collection, analysis and presentation of vegetation data; and the functional and historical aspects of plant communities.

**GEOG 271.3
Regional Biogeography
1/2(3L)**

Prerequisite(s): GEOG 111 or 210 or BIOL 253 or PL SC 213.

A regional treatment of world plant communities emphasizing vegetation types, environmental parameters, faunal assemblages, and modification by human activities.

**GEOG 280.3
Introduction to Resource Geography
1/2(3L)**

Prerequisite(s): 3 credit units in geography or GEOL 121 or 122.

An introduction to the geographic perspectives on resources and resource analysis. Resource appraisal, allocation and evaluation are major topics of the course.

**GEOG 303.6 (Formerly 402)
Spatial Analysis
1&2(3L-1P)**

Prerequisite(s): 12 credit units in geography.

Emphasizes the role of statistics in human and physical geographical research. Topics are covered in univariate, bivariate, multivariate and spatial statistics. Weekly labs and course content emphasize geographical subjects.

GEOG 314.3
Geographies of Health and Healing
1/2(3L)

Prerequisites: GEOG 113 or 114 or 215 (recommended).

The healing or therapeutic affects of environment - an increasingly important determinant of health - are explored in this course from multiple perspectives. Through revealing the healing aspects of place, as framed by the therapeutic landscape concept, this course emphasizes the importance of place as a dynamic element in health and wellness.

GEOG 319.3
Location Theory
1/2(3L)

Prerequisite(s): GEOG 113 or 114 or 215.

Emphasizes the fundamental geographical concepts and theories necessary to explain the location of public and private facilities and the use of rural and urban land.

GEOG 320.3 (Formerly 220)
Cartography
1/2(2L-3P)

Prerequisite(s): GEOG 222, or equivalent background and permission of the department.

History of map making, map projections; relief representation, graphics and statistical mapping, drafting, map design and map reproduction, analysis of map series and sources.

GEOG 321.3 (Formerly 221)
Air Photo Analysis
1/2(2L-3P)

Prerequisite(s): GEOG 222, or equivalent background and permission of the department.

The techniques of data acquisition from and appreciation of air photos; photogrammetry and photo analysis of the geographical environment.

GEOG 322.3 (Formerly 412)
Introduction to Geographic Information Systems
1/2(3L)

Prerequisite(s): GEOG 222, or equivalent background and permission of the department.

Introduces students to the use of computer-based Geographic Information Systems for the management and analysis of spatial data for map production. Topics include vector and raster data structures, spatial data acquisition, geo-referencing, spatial interpolation, overlay analysis, and modelling. Students obtain practical experience with Geographical Information Systems through a series of exercises.

GEOG 323.3 (Formerly 313)
Remote Sensing
1/2(2L-1S)

Prerequisite(s): GEOG 222, or equivalent background and permission of the department.

Advanced lectures, seminars and laboratories for those specializing in resource and environmental studies. It includes inductive and deductive evaluation and air photo patterns and the interpretation of multi-spectral imagery and remote sensing imagery.

GEOG 325.3
Principles of Fluvial Systems
1/2(3L)

Prerequisite(s): GEOG 225.

Processes responsible for the spatial variability of available water resources are introduced and investigated analytically. Topics covered will provide an explanation of the pattern of precipitation, evaporation, infiltration, snowmelt and streamflow.

GEOG 332.3
Microclimatology
1/2 (3L)

Prerequisites: GEOG 233.3 and MATH 110.3; or AGRIC 210.3

The study of natural and modified microclimates near the Earth's surface; energy budgets of forests, lakes, tundra, grasslands, and agricultural crops with an emphasis on Canadian environments; transport of mass and heat. Familiarization with some instruments for microclimatic measurements.

GEOG 333.3
Regional Climatology
2(3L)

Prerequisite(s): GEOG 233.

The classification and distribution of world climates; water budget; the study of the climatic regions of the world with special reference to Canada.

GEOG 335.3
Pleistocene Geomorphology
2(3L)

Prerequisite(s): GEOG 235.

Glacial and periglacial geomorphology, stressing Pleistocene glaciation in Canada and the present periglacial environment.

Note: Students who have taken GEOL 312 may not take this course for credit.

GEOG 336.3
Hillslope Geomorphology
1/2(3L)

Prerequisite(s): GEOG 235 or GEOL 311.

Examination of slope systems as basic landscape units, with an emphasis on understanding the landscape moulding processes of weathering, transportation and deposition.

GEOG 340.3
European Heritage Of Our Built Environment

Prerequisite: GEOG 247 or GEOG 346 or permission of the Department

A field study on urban design and city-form in Central Europe, providing a historical review of architectural styles preserved at Prague and elsewhere in Bohemia. Gothic and Baroque styles are emphasized, particularly as they relate to street and square design.

GEOG 343.3
Legal Issues for Urban Studies and Planning
1/2(3L)

Prerequisite(s): 12 credit units in geography.

Designed for students interested in urban studies and planning, this course reviews legal concepts and issues associated with the functions of municipalities, and especially with their powers for controlling and planning land use. The focus wherever possible, is on

Saskatchewan urban and rural areas, and on Saskatchewan legislation and case law.

GEOG 344.3
Spatial Interaction
1/2(3L-1S)

Prerequisite(s): GEOG 113 or 114 or 215 or permission of the department.

Emphasizes the study of human spatial interaction in urban and regional systems through the use of models. The study of spatial interaction includes population migration, the urban journey-to-work, recreational travel, flow of goods and information, shopping travel, and spatial choice and decision making.

GEOG 346.3 (Formerly 341)
Introduction to Urban Design
1/2(3L)

Prerequisite(s): GEOG 246.

A lecture/seminar on the history, context and elements of the built urban environment. Function and form, and aspects of urban aesthetics are discussed in relation to streetscapes, open spaces and heritage conservation. The relationship of urban design with trends in social thought and with cultural patterns is addressed. The studio consists of design exercises including graphic presentations and elementary applications in computer-aided drafting.

GEOG 347.3
Gender and the City
1/2 (2L/1S)

Prerequisite: 6 credit units in human geography at the 200-level or above, or permission of the Department

This course explores issues relating to gender and contemporary cities in Europe and North America. It introduces feminist geography and explores the relationship between space and gendered social identities. The course then considers sites of gendered social practice - home, neighbourhood and the spatial organization of the city.

GEOG 349.3
Intermediate Urban Geography: Internal Structure of the City
1/2(3L)

Prerequisite(s): GEOG 113 or 114 or 215.

The internal structure of cities, especially those in the industrialized world, and the economic, social, political, and demographic processes that shape our urban areas.

GEOG 351.3
Northern Environments
1/2(3L)

Prerequisite(s): 6 credit units in the natural sciences (GEOG 210 recommended).

A multidisciplinary study of the physical environment of the circumpolar region. Examines the processes operating at the Earth's surface and within the atmosphere and oceans and their role in structuring northern ecosystems. Case studies will permit students with background preparation in the humanities, social sciences and natural sciences to assess the impact of human activity on northern environments.

GEOG 354.3
Historical Geography
1/2(3L)

Prerequisite(s): GEOG 113 or 114 or 215.

An introduction to the aims, content and methodology of Historical Geography. Emphasis will be placed on the development of studies in this discipline in Europe and North America in this century.

GEOG 370.3 Applied Biogeography
1/2(3L)

Prerequisite(s): GEOG 270 or BIOL 253 or PL SC 213 or permission of department.

The impact of human activity on the biosphere is introduced through the examination of environmental problems in agriculture, forestry, mining and industry, and discussed from an ecological perspective.

GEOG 381.3
Geography of Northern Development
1/2(3L)

Prerequisite(s): GEOG 113 or 114 or 215 or NATST 304.

Explores the question of development in northern Canada. The framework for this geographical analysis is provided by the Core/Hinterland Theory. Within this theoretical framework, major resource development will be examined and the regional impact analyzed. Special attention will be placed upon resource development conflicts.

GEOG 390.3
Field Methods in Physical Geography
1(L/P)

Prerequisite(s): 9 credit units in physical geography at the 200-level or above, and permission of the department.

Introduces a variety of field and laboratory approaches, methodologies and techniques that find frequent application in physical geography. Field projects will be undertaken to collect data for analysis, evaluation and presentation.

Note: Required for all four-year majors and honours students in physical geography. Attendance at a field camp held the week preceding the start of the fall (first) term is required. For this course there will be costs in addition to tuition fees.

GEOG 391.3
Field Methods in Human Geography
1(L/P)

Prerequisite(s): GEOG 113 or 114 or 215 and 6 credit units at the 200 level in human geography and permission of the department.

Geography students are introduced to field methods used in human geography. Students will undertake a series of data gathering exercises in the field and then analyze their results.

Note: Required for all four-year majors and honours students in human geography. Attendance at a field camp held the week preceding the start of the fall (first) term is required. For this course there will be costs in addition to tuition fees.

GEOG 405.3
History of Geographic Thought
1/2(3S)

Prerequisite(s): 24 credit units in geography.

A seminar designed to acquaint the major or honours student with the development of geographic thought, emphasizing major

themes and people who have been significant in this development.

**GEOG 419.3
Locational Analysis
1/2(3L)**

Prerequisite(s): GEOG 319.
Emphasizes the fundamental geographical methods necessary to analyze and determine the optimal location of public and private facilities and the rational allocation of rural and urban land use in space. The course also covers regional allocation methods and optimal regionalizations for planning purposes.

**GEOG 433.3 (Formerly 437)
Climates of the Earth
1/2(2L-1S)**

Prerequisite(s): GEOG 333.
A study of causes of climates of the earth including analyses of complex precipitation and temperature regimes. The emphasis will be to examine the surface and upper atmospheric flow patterns and their relationships with the weather and climate.

**GEOG 435.3
Problems in Geomorphology
1/2(3L)**

Prerequisite(s): GEOG 335 or 336.
A study of recent developments in research into weathering, fluvial geomorphology, mass movement and slope processes, karst landforms, glacial and periglacial geomorphology.

**GEOG 442.3
Advanced Land Use Planning
1/2(3L/3S)**

Prerequisite(s): GEOG 249.
A lecture/seminar on analytic methods in land use planning. Input-output relationships affecting land use change are introduced. Information system structure for urban transportation within the context of planning for residential, commercial and industrial land uses is discussed. Reviewed also is the land development process, demographic indicators, and computer procedures identifying geographic target areas for policy intervention throughout a city.

**GEOG 444.3
Problems in Spatial Interaction
1/2(3S)**

Prerequisite(s): GEOG 344.
Focuses on the study of contemporary and current problems in the field of spatial interaction modelling. Student projects will focus on the application of interaction models to real world problems.

**GEOG 446.3
Advanced Urban Design
1/2(3L)**

Prerequisite(s): GEOG 346.
A lecture/seminar on analytic methods in urban design with an emphasis on energy-efficient subdivision design. Design for sustainable development and for pedestrian traffic in open space networks is discussed and analyzed. Issues in the spatial syntax of artificial environments are introduced, with an analysis of artificial object configuration in urban space. The workshop consists of design and discussion exercises and the use of CAD.

**GEOG 449.3
Advanced Urban Geography
1/2(3L)**

Prerequisite(s): GEOG 249 or 349.
Advanced topics in both urban systems and internal structure of the cities. The focus is on alternative approaches and paradigms in the study of urban geography, advanced techniques of urban analysis, and the role of the state in urban geography.

**GEOG 470.3 (Formerly 426)
Theory in Biogeography
1/2(3L)**

Prerequisite(s): GEOG 370 or BIOL 110 and 323.
Pattern and process in the plant world are discussed at local, regional, and global scales with particular emphasis on the environmental control of plant distributions.

**GEOG 480.3
Critical Issues in Environmental
Management
1/2(3S)**

Prerequisites: GEOG 280 and 3 credit units of a field methods course; or permission of the instructor.
This course focuses on the institutional and social aspects of environmental management. Emphasis is placed on the challenges of public policy making and the influence of stakeholders in shaping the purposes and outcomes of management efforts. Each year may feature specific concepts and issues. Critical assessment of research is also undertaken.

**GEOG 490.3
Special Topics in Physical Geography
1/2(2L-2T)**

Prerequisite(s): 6 credit units in physical geography at the 300-level or above, and permission of department.
Students will work on theoretical or practical research projects under the supervision of a faculty member. An outline of the project must be submitted to the course co-ordinator in the term preceding registration and be approved before Departmental permission will be granted. An oral presentation and written report submitted at the end of the project will be evaluated by a faculty committee.

**GEOG 491.3
Research Topics in Human Geography
1/2(3L)**

Prerequisite(s): GEOG 391 and 303 (may be taken concurrently) and permission of department.
Recent research problems and methods in geography. Each student is required to undertake a major research project.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

- GEOG 398.3 1/2(3S)
- GEOG 399.6 1&2(3S)
- GEOG 498.3 1/2(3S)
- GEOG 499.6 1&2(3S)

**CO-OPERATIVE EDUCATION
COURSES IN GEOGRAPHY**

**GEOG 272.0
Work Experience 1**

Prerequisite(s): Acceptance into the program as per the eligibility criteria as designated in Geography, LUEST, or RUD (see the appropriate sections of the Calendar) and approval of the Department or Interdisciplinary Co-ordinator.

**GEOG 372.0
Work Experience 2**

Prerequisite(s): GEOG 272.

**GEOG 373.0
Work Experience 3**

Prerequisite(s): GEOG 372.

**GEOG 472.0
Work Experience 4**

Prerequisite(s): GEOG 373.

**GEOG 473.0
Work Experience 5**

Prerequisite(s): GEOG 472.
Co-operative education students register in one of these courses for each four-month cooperative work term. To be eligible for the first work term, students must have completed no fewer than 54 and no more than 84 credit units of course work. Specific eligibility criteria for each of the participating programs in Geography, Land Use and Environmental Studies (LUEST), and Regional and Urban Development (RUD) are listed in the appropriate sections of the *Calendar*. Satisfactory completion of each work term is required prior to registration in the next work term. Each work term is graded on a Pass/Fail basis.

Courses are taken in the following sequence:
University courses (54 to 84 credit units), two years or more

Work placement GEOG 272.0, summer (May to August)

Work placement GEOG 372.0, Term one (September to December)

University courses (partial third year), Term two (January to April)

Work placement GEOG 373.0, summer (May to August)

University courses (remainder of third year), Term one (September to December)

Work placement GEOG 472.0, Term two (January to April)

Work placement GEOG 473.0 (if desired), summer (May to August)

University courses (fourth year), Term one and two (September to April)

GRADUATE COURSES

Department of Geography, College of Graduate Studies & Research

**GEOG 801.3
Spatial Analysis I
1/2(3L)**

Deals with quantitative methods of spatial analysis as they are used in the field of geography. Emphasis is placed on the application of techniques, practical exercises and projects.

**GEOG 802.3
Spatial Analysis II
1/2(3L)**

Deals with advanced topics in spatial analysis. Emphasis is placed on methods of analysis of complex spatial data and use of models in geography.

**GEOG 803.3
Research in Geography
1/2(S)**

A seminar designed to acquaint the students with the research methodologies in various branches in geography. A critical review of selected literature will be followed by discussions of specific research problems in physical and human geography, and methods of solving them. Students will be presenting a paper in their choice of field.

**GEOG 804.3
Development of Geographical
Thought
1/2(1L-2S)**

A seminar course designed to acquaint the student with the development of the major philosophical problems faced by geographers. Students will prepare papers that address theoretical, philosophical and methodological issues in a subarea of geography.

**GEOG 805.3
Advanced Spatial Analysis in Human
Geography
1/2(1L-2S)**

Presents advanced methods in analytical human geography. The topics will vary with instructor and student needs. Methods of spatial auto correlation, information theory, multidimensional scaling, mathematical regionalization procedures and game theory provide a sample of topics.

**GEOG 806.3
Advanced Spatial Analysis in
Physical Geography
1/2(1L-2S)**

Examines topics in the area of digital terrain analysis, automated watershed segmentation and parameterization, and the application of GIS to problems in earth and environmental science. Topics will vary with the instructor and students.

**GEOG 813.3
Advanced Cartography
1/2(1L-2S)**

Deals with models and theories in cartographic communications; conceptual process and thematic symbolization; cognitive spatial theory and map perception; Semantic Differential Test for thematic map evaluation; and Data Model Concept in statistical cartography.

**GEOG 821.3
Advanced Air Photo Interpretation
1/2(1L-2S)**

Includes review of current literature in air photo interpretation; and seminar discussion on advanced methods and special problems in air photo interpretation.

**GEOG 827.3
Advanced Hydrology
1/2(1L-2S)**

A seminar course designed to explore recent developments in hydrology. Topics

to be covered at the discretion of the instructor.

**GEOG 833.3
Advanced Climatology
1/2(1L-2S)**

Designed to acquaint students with the theory and methods of research in synoptic climatology. Involves a critical review of literature on selected topics dealing with the problem climates of the earth. Seminar discussions will be focused to identify research problems in synoptic climatology and various methods used in solving these problems.

**GEOG 835.3
Advanced Geomorphology
1/2(1L-2S)**

A seminar course designed to explore recent developments in geomorphological theory and the analysis of geomorphological processes. Topics to be covered at the discretion of the instructor.

**GEOG 841.3
Regional Development
1/2(1L-2S)**

A review of the theories of regional development: cumulative causation, forward and backward linkages, export-base, growth poles, and associated concepts of core-periphery diffusion, and spread-backwash processes. This course examines applications of those concepts in North America and the world.

**GEOG 843.3
Advanced Locational Analysis
1/2(1L-2S)**

An examination and development of the theories of the location of public and private facilities. The attending conceptual and mathematical models are presented and evaluated. The course has a theoretical orientation.

**GEOG 845.3
Advanced Urban Geography
1/2(2L)**

A survey of various theories of social and policy planning and their application to the geographical organization and planning of Canadian communities. The emphasis of this course lies on the links between political, economic and social processes within urban areas.

**GEOG 847.3
Geography of Northern Development
1/2(1L-2S)**

Problems of development in northern Canada and the application of geographic methods to solve these problems. Students will participate in these discussions by presenting their critical comments on various development questions and by giving written reports on case examples. Each student will prepare a major essay.

**GEOG 849.3
Problems in Industrial Geography
1/2(1L-2S)**

The examination of current themes and problems in industrial geography.

**GEOG 850.3
Problems in Transportation
1/2(1L-2S)**

The examination of current research themes and problems in transportation geography.

Alternate topics may be covered to reflect student needs.

**GEOG 853.3
Advanced Geography of Population
1/2(1L-2S)**

Focuses on geographical theories of population and/or migration which have particular application for understanding the spatial changes in population. Each of these theories will be discussed and analyzed by students in the seminar. Each student will prepare a major essay on one of these geographical theories.

**GEOG 870.3
Advanced Biogeography
1/2(1L-2S)**

A review and discussion of current methods, problems and research areas in biogeography.

**GEOG 898.3/899.6
Special Topics
1/2(3S), 1&2(3S)**

A reading course for graduate students focusing on areas for which there is no regular graduate course or for making up the deficiencies in the research program.

**GEOG 990
Departmental Seminar**

During residence, candidates will register in GEOG 990 and will present at least one paper based on their own research (likely thesis research).

**GEOG 994
Research**

Students writing a Master's thesis must register for this course.

**GEOG 996
Research**

Students writing a Ph.D. thesis must register for this course.

GEOLOGICAL ENGINEERING

Department of Civil and Geological Engineering, College of Engineering

**GEO E 218.3
Engineering Geology
1(3L-1.5P)**

Introduction to engineering geology, engineering geomorphology, site investigations, airphotos and airphoto interpretation. Emphasis will be placed on the surficial geology of the Canadian Prairies.

**GEO E 315.3
Rock Mechanics
2(3L-1.5P)**

Prerequisite(s): C E 328 (taken). Physical properties of rock. Rock stress-deformation behaviour and failure. Laboratory and *in situ* testing.

**GEO E 378.3
Engineering Geological Mapping
3(P)**

Prerequisite(s): GEOL 224, 243, 258, C E 328 and GEO E 315. Introduction to field methods in geological engineering: mapping, discontinuity surveys, analysis and design. A two-week field camp immediately preceding first term in the final year of the GEO E program.

**GEO E 412.3
Reservoir Mechanics
2(3L-1.5P)**

Prerequisite(s): C E 319 (or 324) or M E 335.

Corequisite(s): GEOL 463.

Fluid flow in hydrocarbon reservoirs; material balance equations; oil and gas well testing; waterflooding and EOR methods; fractional and segregated flow of immiscible fluids.

**GEO E 414.3
Rock Mechanics Design
1(3L-1.5P)**

Prerequisite(s): GEO E 315.

Applications of rock mechanics to design in civil and mining engineering.

**GEO E 466.3
Petroleum Geomechanics
2 (3L-1.5P)**

Prerequisite(s): 90 credits in the Civil or Geological Engineering programs or permission of the Department Head.

Geomechanical, geotechnical and petrophysical problems of interest to the petroleum industry: petroleum well drilling, borehole breakouts, wellbore stability, hydrofracture, settlement and consolidation due to oil withdrawal.

**GEO E 475.3
Advanced Hydrogeology
1(3L-1.5P)**

Prerequisite(s): C E 319 or CH E 320.

Contaminant transport; regional groundwater flow; petroleum hydrogeology; fluid migration in basins; surface-water groundwater interaction; introduction to groundwater modelling.

**GEO E 495.6
Design Project
1&2(1L-3P)**

Prerequisite(s): G E 300 (or 390). Students must be in graduating year or have permission of the Program Coordinator.

Each student must plan and complete a project and submit a written engineering report. The project may involve original laboratory investigations and/or field case history studies and/or computer design problems. Results are presented orally at a seminar.

GEOLOGICAL SCIENCES

Department of Geological Sciences, College of Arts & Science

**GEOL 108.3
Earth Processes
1/2(3L)**

Exploration of the global and local-scale physical processes that have shaped our planet. Strong emphasis is on interrelationships of geological processes and humans. Topics for discussion include volcanoes, earthquakes, pollution, and the origin and exploitation of energy, mineral and water resources.

Note: May be used toward the Natural Science requirement for Programs Type A, B, and D (B.A. programs). Students with credit for GEOL 103, 105, 110 or 121 may not take this course for credit.

**GEOL 109.3
Earth History
2(3L)**

A consideration of the evolution of our earth, from its origin to the present. Emphasis is placed on the evolution of life, and on the interpretation of the rock and fossil record. Special consideration is given to major events in the history of our planet and of animals and plants.

Note: May be used toward the Natural Science requirement for Programs Type A, B, and D (B.A. programs). Students with credit for GEOL 103, 105, 110 or 122 may not take this course for credit.

**GEOL 121.3
Physical Geology
1/2(3L-3P)**

Follows the same lectures as GEOL 108. The laboratory component satisfies the requirements of students in Program Type C (B.Sc. programs). Students in the College of Education who wish to take a course in Earth Science and require a laboratory component are advised take this course.

Note: Students with credit for GEOL 103, 105, 108, 110 or GEO E 118 may not take this course for credit.

**GEOL 122.3
Historical Geology
2(3L-3P)**

Follows the same lectures as GEOL 109. The laboratory component satisfies the requirements of students in Program Type C (B.Sc. programs). Students in the College of Education who wish to take a course in Earth Science and require a laboratory component are advised to take this course.

Note: Students with credit for GEOL 103, 105, 110 or 109 may not take this course for credit.

**GEOL 206.3
Earth Systems
1/2(3L)**

Prerequisite(s): 6 credit units in a 100-level science course(s).

An introduction to Earth System Science, a concept that demonstrates the interrelationships between the Earth's landmasses, atmosphere, oceans and biosphere, and the role of humans in their interaction. Topics discussed will include geochemical cycles and environmental change, both natural and anthropogenic.

Note: Students with credit for GEOL 205 or 209 or BIOL 107 or 108 may not take this course for credit.

**GEOL 224.3
Mineralogy and Petrology
1(3L-3P)**

Prerequisite(s): GEOL 110 or 121 (GEO E 118); CHEM 112. Students with GEOG 112 may take this course with permission of the department.

Crystalline materials and their properties, crystal chemistry and chemical equilibria in natural system, mineral properties and classification, mineral genesis; classification and petrogenesis of igneous and metamorphic rocks.

Note: Students with credit for GEOL 221 may not take this course for credit.

**GEOL 225.3
Advanced Mineralogy
2(3L-3P)**

Prerequisite(s): GEOL 224, CHEM 115 (may be taken concurrently).
Optical mineralogy, X-ray crystallography, crystal chemistry, major rock-forming mineral groups, mineral stability.
Note: Students with credit for GEOL 221 may not take this course for credit.

**GEOL 229.3
Introductory Geochemistry
2(3L)**

Prerequisite(s): GEOL 121 (GEO E 118); MATH 110 (may be taken concurrently); CHEM 112. Students with GEOG 112 may take this course with permission of the department.

An overview of geochemical theory and problem-solving techniques used by Earth Scientists to elucidate Earth system processes. Topics of discussion will include the origin of elements, stable and radiogenic isotopes, geochronology, thermodynamics, trace element partitioning in mineral fluid systems, weathering and aqueous geochemistry.

Note: Students with credit for GEOL 428 may not take this course for credit.

**GEOL 243.3
Sedimentology
1(3L-2P)**

Prerequisite(s): GEOL 110 or 121 (GEO E 118). Students with GEOG 112 may take this course with permission of the department.

An introduction to physical and sedimentary processes, and the origins and characteristics of the main types of sedimentary rocks. Selected continental and marine depositional environments are discussed. Laboratories focus on the identification of sedimentary rocks in hand specimen and the applications of sedimentary structures. The multidisciplinary applications of sedimentology are emphasized.

Note: Students with credit for GEOL 241 may not take this course for credit.

**GEOL 246.3
Stratigraphy and Stratigraphic
Palaeontology
2(3L-3P)**

Prerequisite(s): GEOL 243.
The principles of stratigraphic analysis. Covers classical and modern methods, including litho-, bio-, and chronostratigraphy, and sequence stratigraphy. A brief introduction is given to the main fossil groups, emphasizing their application to dating sedimentary rocks. Problems of correlation are discussed. Laboratories include examples of the different approaches to stratigraphic analysis of sedimentary rocks.

Note: Students with credit for GEOL 241 may not take this course for credit.

**GEOL 258.3
Structural Geology
1(3L-3P)**

Prerequisite(s): GEOL 110 or 121 (GEO E 118). Students with GEOG 112 may take this course with permission of the department.

An introduction to the structural features of rocks; including discussions of their origin and use. The description of folds, faults, and joints are emphasized, along with

outcrop relationships of intrusive bodies. Other topics will include tectonics, orogeny, stratigraphic facing, and non-orogenic process, such as salt doming and glacial thrusting. Laboratories will introduce mapping techniques and the analysis of geological maps.

Note: Students with credit for GEOL 252 may not take this course for credit.

**GEOL 282.3
Earth Physics
1(3L)**

Prerequisite(s): MATH 112 or 116 or 124; PHYS 111 or 121 or E P 155

Physical processes in the origin of the Earth and Moon, and in the subsequent development of internal structure. The generation of the geomagnetic field by dynamo action, and the use of magnetism and gravity in geophysics. Earthquakes and global seismology. The use of satellite data in geophysics.

Note: Students with credit for GEOL 382 may not take course for credit.

**GEOL 308.3 (Formerly GEOL 407)
Geological Mapping I (Fall or Spring
camp)
1/3(P)**

Prerequisite(s): GEOL 224, 243, 246 and 258, or permission of the department.

A field course held at the Little Rocky Mountains, Montana. Emphasis will be placed on interpreting and mapping sedimentary rocks, although igneous rocks will also be studied.

Note: There will be costs additional to tuition fees. Normally held in early May or late August, two weeks prior to beginning of on-campus classes.

**GEOL 311.3
Principles of Geomorphology
1(3L)**

Prerequisite(s): GEOG 112 or 210, GEOL 110 or 121 (GEO E 118).

The description and objective classification of landforms, their appearance on maps, and the processes and principles involved in their origin and distribution.

Note: Students with credit for GEOG 235 may not take this course for credit.

**GEOL 312.3
Pleistocene Geomorphology
2(3L)**

Prerequisite(s): GEOG 235 or GEOL 311 or C E 211.

Glacial and periglacial geomorphology, stressing Pleistocene glaciation in Canada and the present periglacial environment.

Note: Students who have taken GEOG 236 or GEOG 335 may not take this course for credit.

**GEOL 324.3
Igneous Petrology
1(3L-3P)**

Prerequisite(s): GEOL 225, 229.

Mineralogy, phase relations, origin, and occurrence of igneous rocks. Geological processes that tend to produce and modify a magma, will be interpreted in the light of chemical equilibria and kinetics. The laboratory will involve the study of igneous rocks in thin section.

**GEOL 325.3
Metamorphic Petrology
2(3L-3P)**

Prerequisite(s): GEOL 225, 229.

The mineralogy, phase relations, possible equilibration temperatures and pressures, and occurrence of metamorphic rocks. Geological processes that tend to produce geothermal and geobarometric gradients and modify rocks will be interpreted using chemical equilibria and chemical-thermal kinetics. The laboratory will involve the study of metamorphic rocks in thin section.

**GEOL 329.3
Introductory Biogeochemistry
1/2 (3L)**

Prerequisites: 6 credit units of chemistry; MATH 110; and one of BIOL 253, PL SC 213, GEOG 111 or GEOL 121.

An introduction to chemical processes operating at the interface between biotic and abiotic systems. Emphasis will be placed on the use of stable isotope tracer techniques in environmental, medical, pharmacological, and archaeological research, and on the fundamental principles of metal chemistry, speciation, bioavailability and toxicity in aqueous media.

**GEOL 332.3
Palaeontology
1(3L-3P)**

Prerequisite(s): GEOL 246.

The principles of palaeontological classification; the major groups of index fossils; the nature and geological history of reef-building organisms; plant and vertebrate fossils; fossils as rock-formers and as indicators of past environmental conditions. The economic importance of fossils.

**GEOL 334.3 (Formerly GEO E 334.3)
Gravity, Magnetism and Radiation
Methods
1(3L-3P)**

Prerequisite(s): CMPT 116 or 122; MATH 223 and 224, or 225 and 226; E E 201 or G E 212 or PHYS 227.

Basic theory of gravity, magnetism and radiation methods. The application of geophysical measurements in geological engineering, groundwater and prospecting problems.

Note: This course is also taught as GEO E 334 by the College of Engineering. Students with credit for GEO E 333 or 334 may not take this course for credit.

**GEOL 335.3
Seismology, Radar and Electrical
Methods
2(3L-3P)**

Prerequisite(s): CMPT 116 or 122; MATH 223 and 224, or 225 and 226; E E 201 or G E 212 or PHYS 227.

Basic theory of seismic, radar and electrical methods. The application of geophysical measurements in geological engineering, groundwater, and prospecting problems.

Note: This course is also taught as GEO E 335 by the College of Engineering. Students with credit for GEO E 333 or 335 may not take this course for credit.

**GEOL 343.3
Facies Models
1(3L-3P)**

Prerequisite(s): GEOL 246, 308 (407) and 332 (may be taken concurrently).

The history of the facies concept; sedimentary environments and facies; techniques of facies analysis; modern environments of deposition; interpretation of ancient sedimentary environments; sedimentary facies through geological time; sedimentary facies, sea level, and tectonics.

**GEOL 358.3
Structural Geology II
2(3L-3P)**

Prerequisite(s): GEOL 258.

The geometry, character, and origin of folds, faults and rock cleavage: their inter-relationships and analysis. The analysis of complex geological maps. Ductile strain, strain analysis, deformation fabrics, ductile faulting, shear-sense indicators and the brittle/ductile transition will be discussed. The analysis of polyphase deformation, interference structures, and sequential deformation fabrics.

Note: Students with credit for GEOL 252 may not take this course for credit.

**GEOL 384.3
Introduction to Applied Geophysics
2(3L-3P)**

Prerequisite(s): GEOL 258; MATH 110, and 112 or 116. (Students, other than geology students, are accepted without prerequisite on written approval of the Geology Department).

Principles and methods of geophysics; their use in the interpretation of crustal structures of both tectonic and stratigraphic origin; their role in locating probable centres of mineral concentration; their application to problems in engineering geology.

Note: Students with credit for GEO E 333, 334 or 335 or GEOL 334 or 335 may not take this course for credit.

**GEOL 406.3
Global Considerations in Geology
1(3L)**

Prerequisite(s): GEOL 241 or 243 and 246, 252 or 258 and 358, and 324.

Origin of the universe and the solar system; the early earth and the origin and evolution of its core, mantle, crust, oceans, and atmosphere. The Archaean-Proterozoic contrasts; plate tectonics; geochemical cycles and budgets; climatic, atmospheric, hydrospheric and biospheric change; limits on resource exploitation; occurrence, distribution and retardation of radionuclides.

Note: Students with credit for GEOL 409 may not take this course for credit.

**GEOL 408.3 (Formerly GEOL 307)
Geological Mapping II (Fall camp)
1(P)**

Prerequisite(s): GEOL 308 (407) and one of GEOL 324, 325 or 358.

Methods of geological mapping and report writing based on a field course on the Precambrian Shield. Emphasis will be placed on volcanic rocks, although intrusive, sedimentary, and metamorphic rocks will also be studied.

Note: There will be costs additional to tuition fees. Normally held in late August,

two weeks prior to beginning of on-campus classes.

**GEOL 411.3
Well-logging
1(3L)**

Prerequisite(s): GEOL 110 or 121 or GEO E 118; MATH 223 and 224, or 225 and 226; G E 212 or PHYS 227.

Discussion of the types of geophysical measurements that are made in boreholes with emphasis on the physical principles and problems involved in evaluation of geological formations.

Note: This course is also taught as GEO E 411 by the College of Engineering. Students with credit for GEO E 411 may not take this course for credit.

**GEOL 429.3
Isotope Geochemistry
1/2(3L)**

Prerequisite(s): GEOL 224, 229.

An overview of theory and applications of stable and radiogenic isotope geochemistry including the use of isotopes as geotracers, geochronometers and geothermometers.

**GEOL 433.3
Evolution of the Vertebrates
2(3L)**

Prerequisite(s): GEOL 241 or 243 and 246 (Students, other than geology students, are accepted without prerequisite on approval of the Geology Department).

The geological history of the principal groups of vertebrates, with emphasis on palaeontological general morphology and evolutionary relationships.

**GEOL 435.3
Microfossils
1/2(3L-3P)**

Prerequisite(s): GEOL 332.

Introduction to the twin disciplines of micropalaeontology, concerned with mineralized microfossils, and palynology, concerned with organic-walled microfossils, techniques of extraction, study and classification of microfossils. Their use in stratigraphy, archaeology and the determination of past environments, climates and oceanic circulation patterns.

**GEOL 437.3
Palaeoecology
1/2(2L-2P)**

Prerequisite(s): GEOL 241 or 243 and 246 (or permission of the department for non-geology students).

Study of the relationship between organisms and their environments during geological time; the use of fossils in reconstruction of the conditions of deposition of ancient sediments.

**GEOL 439.3
Palaeobotany
1(3L-3P)**

Prerequisite(s): GEOL 241 or 246 or BIOL 205 (or permission of the department for non-geology students).

An evolutionary survey of the principal groups of plants based on the fossil record. Consideration will be given to the origins of life and to the history of the algae and bryophytes, and emphasis will be placed on the vascular plants. The course will include discussion of modes of fossilization and of palaeobotanical techniques.

**GEOL 444.3
Tectonic Evolution of North America
1(3L-3P)**

Prerequisite(s): GEOL 258 and 324 (which may be taken concurrently).

A review of the theory of plate tectonics and an outline of the Archean, Proterozoic and Phanerozoic tectonic history of the continent, with special attention to the tectonic controls on sedimentary basins and to the evolution of both continental margins.

**GEOL 445.3
Phanerozoic History of North America
2(3L-3P)**

Prerequisite(s): GEOL 241 or 246.

Paleozoic, Mesozoic and Cenozoic history of North America and comparisons with select areas and events of other continents; emphasis on western Canada in laboratory exercises and tutorials.

**GEOL 446.3
Advanced Sedimentology
1(3L-3P)**

Prerequisite(s): GEOL 221 or 224, 229 and 343 (may be taken concurrently).

Chemical, biochemical and physical processes in the formation of sedimentary rocks; origin, diagenesis and petrography of carbonates, evaporites and cherts. Major topics of current sedimentological interest may also be discussed.

**GEOL 463.3
Petroleum Geology
2(3L-3P)**

Prerequisite(s): GEOL 221 or 224 or 228; 241 or 243 and 246 (which students in geophysics may take concurrently) and 252 or 258.

The composition and physical properties of petroleum. Organic matter evolution, maturation, and migration of hydrocarbons from source rock to reservoir. Introduction to petroleum exploration, development and recovery methods, and the main types of reservoirs and traps.

**GEOL 465.3
Metalliferous Mineral Deposits
1(3L-3P)**

Prerequisite(s): GEOL 246, 258 and 324.

Geology and genesis of the principal types of deposits of metallic ores. Emphasis on the lithologic, stratigraphic, and structural environments as criteria for understanding and exploring for these deposits.

**GEOL 478.3 (Last offered 2000-2001)
Hydrogeology
2 (3L-3P)**

Prerequisite(s): GEOL 241 or 243 and 246; 252 or 258; MATH 110, and 112 or 116.

Introduction to aquifer exploration and delineation, resource evaluation, development and contamination. Laboratories will concentrate on geological analysis and interpretation.

Note: Senior students in related scientific and engineering departments may seek permission of the instructor to take the course.

**GEOL 481.3
Potential Field Methods
1(3L-3P)**

Prerequisite(s): GEO E 334 and 335 (GEO

334 and 335) and CMPT 116 or equivalent.

The theory of interpretation of gravity and magnetic fields in geophysical exploration. Elements of potential theory, mathematical models, Fourier methods and interpretation procedure will be discussed.

**GEOL 482.3
Electrical Methods in Geophysical
Prospecting
2(3L-3P)**

Prerequisite(s): GEO E 334 and 335 (GEO 334 and 335) and CMPT 116 or equivalent.

The fundamental principles underlying electrical methods; instrumentation, field procedures, and the computation and interpretation of data; application of the methods in geophysical exploration.

**GEOL 483.3
Seismology
2(3L-3P)**

Prerequisite(s): GEO E 334 and 335 (GEO 334 and 335) and CMPT 116 or equivalent.

Theory of elasticity; energy sources; refraction and reflection methods; instrumentation and interpretation, including the fundamentals of digital processing.

**GEOL 485.6
Geophysics Field Camp
1/3(P)**

Prerequisite(s): GEO E 334 and 335 (GEO 334 and 335).

Practical experience in conduct of geophysical surveys; operation of equipment, data manipulation, computer processing and interpretation, preparation of reports. Normally held in late August, two weeks prior to the beginning of on-campus classes.

**GEOL 487.3
Geophysical Field Methods
1/3(P)**

Prerequisite(s): GEOL 384 or GEO E 334 and 335 (GEO 334 and 335).

A course in geophysical field methods for students who are not geophysics majors but who require some experience with field techniques. Gravity, magnetic, electro-magnetic and seismic surveys will be performed over appropriate targets. The course is normally conducted in the two weeks immediately preceding the fall regular session. Interested students should contact the department for further details.

Note: Students with credit for GEOL 485 or GEO E 473 may not take this course for credit.

**GEOL 490.3
Geological Sciences Research
1/2(3P)**

Prerequisite(s): 6 credit units in geological sciences at the 300-level or above and permission of the department.

Students will work on theoretical or practical research projects under the guidance and supervision of a faculty member. An outline of the project must be submitted to the course co-ordinator in the term preceding registration and be approved before Departmental permission will be granted. An oral presentation and written report submitted at the end of the project will be evaluated by a faculty committee.

**GEOL 492.6
Geological Sciences Research
1 & 2(3P)**

Prerequisite(s): 6 credit units in geological sciences at 300-level or above, and permission of the department

Students will work on theoretical or practical research projects under the guidance and supervision of a faculty member. An outline of the project must be submitted to the course co-ordinator in the term preceding registration and be approved before Departmental permission will be granted. An oral presentation and written report submitted at the end of the project will be evaluated by a faculty committee.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

GEOL 398.3 1/2(3S)

GEOL 399.6 1&2(3S)

GEOL 498.3 1/2(3S)

GEOL 499.6 1&2(3S)

GRADUATE COURSES

Department of Geological Sciences,
College of Graduate Studies & Research

**GEOL 815.3
Glacial Geology
2(3L)**

Landforms and sediments related to glaciations. Continental glaciation during the Pleistocene and its deposits. Methods of investigation used in reconstructing the glacial history of a region. Glacial features on maps and air photographs.

**GEOL 816.3
Quaternary Stratigraphy
2(3L-3P)**

Litho-, bio-, and chrono-stratigraphy of Quaternary glacial fluvial, lacustrine, and marine sediments. The reconstruction of Quaternary history through the recording, investigating, dating and correlating of Quaternary sedimentary sequences. The importance of sedimentological, stratigraphical, and structural characteristics of Quaternary deposits for practical use in science and engineering.

**GEOL 822.6
Analytical Geochemistry
1&2(2L-3P)**

Prerequisite(s): GEOL 324, and 325.

Analytical techniques employed by earth scientists for determining the compositions, ages, and provenance of minerals and rocks. The theory, operation, and information that can be obtained from a variety of instruments will be studied. These instruments will include the X-ray diffractometer, the X-ray fluorescence spectrometer, the electron microprobe and scanning electron microscope (SEM), the atomic-absorption spectrometer, the gas chromatograph, and isotope ratio and solid source mass spectrometers.

**GEOL 828.6
Geochemistry
1&2(3L)**

The theory and application of instrumental techniques to the geochemistry of minerals and rocks. Topics include: terrestrial and cosmic abundance of elements; theory of element partitioning and its application to geothermometry and geobarometry; the behaviour of major and trace elements during partial melting and fractional crystallization; radiogenic and stable isotopic systems.

**GEOL 829.6
Petrology
1&2(3L)**

Dynamic and comprehensive treatment of important aspects of igneous and metamorphic petrology at an advanced level. Problems of current interest will be analyzed and discussed through integrated lectures, seminars, and laboratories.

**GEOL 832.3
Considerations in Palaeontology
1/2(1.5L-1.5S)**

Application of the concepts and principles of palaeontology to the interpretation of sedimentary rock sequences.

**GEOL 835.3
Palynology
1/2(1S-1P-1R)**

Advanced studies on fossil dinoflagellates and acritarchs, and spores and pollen, emphasizing their variation through geological time and their use in palaeoecological interpretation. (Practical work on material from North American and European sedimentary sequences will form a major part of this course).

**GEOL 836.3
Fossils and Organic Evolution
1/2(1.5L-1.5S)**

Concepts of organic evolution, stressing the evidence afforded by the fossil record. Topics will include biostratigraphy, variability, adaptation, natural selection, radiation, extinction, and evolution in time and space.

**GEOL 841.3
Sedimentary Processes
1/2(1.5L-1.5S)**

Advanced-level consideration will be given to one or more of the following topics: fluid mechanics and its role in the interpretation of deposition of sediment; experiments in sedimentology and their role; biological and chemical processes and their influence on sedimentation; diagenesis of sediments.

**GEOL 842.3
Sedimentary Depositional
Environments
1/2(1.5L-1.5S)**

Investigations of selected modern environments of sedimentation and their application to the reconstruction of ancient sedimentary environments. May include consideration of a broad spectrum of environments or may focus on a few closely related environments and give them more detailed consideration.

**GEOL 848.3
Concepts in Stratigraphy
1(3L)**

The historical development of the concepts and principles of stratigraphy and the relative geologic time scale; the classification of stratigraphic units using a comparison of various stratigraphic codes; international problems in stratigraphic classification and correlation.

**GEOL 849.3
Selected Problems in Stratigraphy
2(1L-1S-1R)**

Application of the concepts and principles of stratigraphy, including sequence stratigraphic perspectives, to the interpretation of sedimentary basins.

**GEOL 853.6
Structural Geology
1&2(3L)**

The geometry and mode of formation of deformational structures in rocks on local and regional scales. Emphasis will be placed on mapping techniques in structurally complex terrains, the analysis of polyphase deformation, and the textures of deformed rocks. Some attention will be given to rock and crystal deformational processes and to the mechanics of faulting and folding.

**GEOL 865.3
Analysis of Mineral Deposits
1/2(1.5L&1.5S)**

Prerequisite(s): Permission of the instructor. Advanced level consideration of structural, magmatic, and hydrothermal processes involved in the formation and evolution of mineral deposits, and their relationship to the Earth and the environment. The application of petrological and geochemical techniques to mineral deposit research. Problems of current interest will be addressed through lectures, and student presentations.

**GEOL 871.3
Advanced Hydrogeology
1(1.5S-1.5R)**

Classification of aquifers. Microstructure and macrostructure of geological porous media. Relationships between mechanical, thermal and fluid flow properties. Parameter identification. Modeling groundwater flow, heat transport and solute transport. Introduction to multiphase flow. The course will concentrate on the use of models to quantify the transport of fluids, solutes and heat through geological systems. Particular emphasis will be placed on the correct characterization of the materials and the importance of geological discontinuities in control of fluid flow.

**GEOL 872.3
Computer Methods in Geomechanics
1/2(3L-3P)**

Prerequisite(s): GEO E 314 and 315 or 414 (preferably both); or equivalent. Numerical formulation of geomechanical problems: finite differences, finite elements and boundary integrals. Numerical methods for solving large linear systems. Non-linearities in geomechanical problems. Students will be expected to complete individual modeling projects.

**GEOL 874.3
Advanced Rock Mechanics
2(1.5S-1.5R)**

Topics selected from: Rheological behaviour of rock. Theories of stress distributions around openings in rock. Failure criteria for rock and rock masses. Behaviour of rock under dynamic stresses. Effects of blasts and shock on underground workings. Application of laboratory and in situ tests. Evaluation of the bulk properties of rock. Students will be expected to complete individual projects on specific topics and a final examination.

**GEOL 875.3
Advances in Geomechanics
1/2(3L-1S)**

Prerequisite(s): GEO E 315 or 414 (preferably both); or equivalent. Topics selected from: ground freezing, rock remediation and ground treatment, rock support, rock excavation and fragmentation, rock slope stability and design, rock instrumentation and monitoring systems. Students will be expected to present seminars and written reports on assigned topics.

**GEOL 880.3
Seismology
1(3S)**

Topics selected from the theory of propagation of seismic waves in layered media; theory of reflection and refraction of spherical waves, present advances in numerical filtering; information theory as related to geophysics.

**GEOL 881.3
Gravity and Magnetic Interpretation
1(3S)**

Mathematical and computer techniques of interpreting gravity and magnetic maps including analytical models, Fourier techniques, analytical continuation, application to actual problems. Special topics according to student needs.

**GEOL 882.3
Selected Topics in Geophysics
1/2(3S)**

The detailed content may vary from year to year in accordance with the specific interests of students but will include some consideration of electrical methods, well-logging techniques, and other fields of applied geophysics.

**GEOL 883.3
Advances in Exploration Geophysics
2(3S)**

A presentation of modern geophysical theories, emphasizing recent advances in interpretation and the influence of geophysical theories and methods on the development of modern geological thought. Topics include seismic stratigraphy, direct detection of hydrocarbons, crustal structure, rock magnetism, and airborne survey systems.

**GEOL 884.3
Geophysical Inversion
1/2(2L-2P)**

Prerequisite(s): MATH 226, 338, GEOL 483, GEO E 414; or permission of the instructor. A practical course on inversion techniques in geophysics. Linear discrete inverse

problems will be discussed, and an appreciation for the concepts of non-uniqueness, determinacy, and the use of a priori information will be emphasized. Students will be encouraged to use the techniques discussed in class in a computer laboratory and will be required to complete a term project with a written report, and a seminar.

**GEOL 898.3/899.6
Special Topics**

**GEOL 990
Seminar**

Presentation of papers by faculty, visiting scientists, and graduate students. Graduate students are required to attend and interested undergraduates may be invited to attend. Satisfactory participation in this course is required of all graduate students throughout their period of residence.

**GEOL 994
Research**

Students writing a Master's thesis must register for this course.

**GEOL 996
Research**

Students writing a Ph.D. thesis must register for this course.

GERMAN

Department of Languages and Linguistics,
College of Arts & Science

Students registered in any of the language courses (114.3, 117.3, 214.3, 217.3, 314.3, 317.3) should plan to attend weekly oral tutorials as scheduled in the *Registration Guide*. A multi-media laboratory is also available on a library basis.

Students with a background in German (including those who speak the language at home) will not be allowed to take German language courses for credit, until they have contacted the department to arrange for an interview/placement test prior to registering.

**GERM 114.3 (Formerly 115.6)
Elementary German I
1/2(4L-1T)**

This beginner-level course will cover all four language skills (listening, speaking, reading and writing) in a communicative setting with emphasis on inter-cultural understanding. Basic grammar terminology and application will be introduced.

Note: Students who have completed German 30 in the past five years may not take this course for credit. Students with some high school German, and students with some background in German must present themselves to the Department for a competency evaluation prior to registering. Native speakers of German will not be allowed to register in this course. Students with credit for German 115 may not take this course for credit.

**GERM 117.3 (Formerly 115)
Elementary German I
1/2(4L-1T)**

Prerequisite: GERM 114 or permission of the department.

The subsequent course to GERM 114.3, this advanced beginner-level course will continue to cover all four language skills (listening, speaking, reading and writing) in a communicative setting with emphasis on inter-cultural understanding.

Note: Students who have completed German 30 in the past five years may not take this course for credit. Students with some high school German, and students with some background in German must present themselves to the Department for a competency evaluation prior to registering. Native speakers of German will not be allowed to register in this course. Students with credit for German 115 may not take this course for credit.

**GERM 202.3 (Formerly 200)
Intermediate German I: Emphasis on
Literature and Culture
1/2(3L)**

Prerequisite(s): GERM 114 and 117 or permission of the department.

A continuation of exposure to contemporary culture and everyday life, and an introduction to contemporary literature. Designed to strengthen communicative competency stressing oral expression. Recommended as a course to be taken concurrently with GERM 214, 217, 314, and 317.

Note: Native speakers of German will not be allowed to register in this course. Students with credit for German 200 may not take this course for credit.

**GERM 204.3 (Formerly 200)
Intermediate German II: Emphasis on
Literature and Culture
1/2(3L)**

Prerequisite(s): GERM 202 or permission of the department.

Further exposure to contemporary German culture, literature and everyday life. Designed to enhance communicative competency both orally and in writing. Recommended as a course to be taken concurrently with GERM 214, 217, 314, and 317.

Note: Native speakers of German will not be allowed to register in this course. Students with credit for German 200 may not take this course for credit.

**GERM 212.6
German Culture and Thought (in
English)
1&2(3L)**

Prerequisite(s): Completion of 30 credit units at the university.

Surveys cultural events, emphasizing the important epochs in Central European Literature. Deals with major developments in philosophy, religion, art, architecture and music.

Note: This course cannot be used to fulfill the language requirement. It may be used to fulfill the humanities requirements or as an elective under Requirement 7.

**GERM 214.3 (Formerly 215)
Intermediate German I:
Communicative and Grammatical
Skills
1/2(3L-1T)**

Prerequisite(s): GERM 114 and 117 or permission of the department.

This intermediate-level course focuses on increased competency in oral and written communication and cultures. Students read and discuss a variety of texts, learn more about issues and problems of contemporary life in German-speaking countries and consolidate and expand their knowledge and mastery of grammar.

Note: Students with high school German, and students with some background in German must present themselves to the Department for a competency evaluation prior to registering in order to establish whether they may take this course for credit. Students with credit for German 215 may not take this course for credit.

**GERM 217.3 (Formerly 215)
Intermediate German II:
Communicative and Grammatical
Skills
1/2(3L-1T)**

Prerequisite(s): GERM 214.

The subsequent course to GERM 214 concentrates on increased competency in oral and written communication. Students read and discuss a variety of texts, learn more about issues and problems of contemporary life in German-speaking countries and expand their knowledge and mastery of grammar.

Note: Students with high school German, and students with some background in German must present themselves to the Department for a competency evaluation prior to registering in order to establish whether they may take this course for credit. Students with credit for German 215 may not take this course for credit.

**GERM 231.6
German Literature Before 1700
1&2(3L)**

Prerequisite(s): GERM 214, 217.

The reading, and discussion, of literary texts, and introductions to the history of German literature and the history of the German language.

**GERM 241.6
German Literature in the Age of
Goethe
1&2(3L)**

Prerequisite(s): GERM 214, 217.

Historical and cultural perspective of the time and of such movements as the Enlightenment, Storm and Stress, and of Classicism through the reading and discussion of representative works of Lessing, Goethe, and Schiller.

**GERM 251.6
German Literature in the 19th
Century
1&2(3L)**

Prerequisite(s): GERM 214, 217.

The literature of Romanticism and Realism.

**GERM 261.0
Revolution and Dissidence: Studies
in Protest Literature
1/2(1T)**

Prerequisite(s): GERM 214, 217 (may be

taken concurrently).

A tutorial accompanying LIT 261.3.

**GERM 262.0
Exiles and Emigrés: Studies in
Expatriation
1/2(1T)**

Prerequisite(s): GERM 214, 217 (may be taken concurrently).

A tutorial accompanying LIT 262.3.

**GERM 263.0
Heroines, Anti-Heroines and Gender
Definition in Literature
1/2(1T)**

Prerequisite(s): GERM 214 and 217 (may be taken concurrently).

A tutorial accompanying LIT 263.3.

**GERM 264.0
Mephisto and Faust: Knowledge,
Power, Damnation and Redemption
1/2(1T)**

Prerequisite(s): GERM 214, 217 (may be taken concurrently).

A tutorial accompanying LIT 264.3.

**GERM 314.3 (Formerly 315)
Advanced German I
1/2(3L-1T)**

Prerequisite(s): GERM 217.

This advanced-level course aims at developing post-intermediate proficiency in oral and written communication and culture. Grammar review and expansion, and a wider vocabulary will be studied, interlinked with literary texts reflecting German culture.

Note: Students with credit for GERM 315 may not take this course for credit.

**GERM 317.3 (Formerly 315)
Advanced German II
1/2(3L-1T)**

Prerequisite(s): GERM 314.

The subsequent course to GERM 314 concentrates on broadening vocabulary and useful complex grammar structures while reading literary texts reflecting German culture.

Note: Students with credit for GERM 315 may not take this course for credit.

**GERM 361.6
German Literature in the 20th
Century
1&2(3L)**

Prerequisite(s): GERM 214, 217.

The works of leading Austrian, Swiss, and German writers, with a focus on artistic form and socio-political ideas. Selections from dramatic literature emphasize the contemporary German idiom.

**GERM 490.6
Seminar in German Literature
1&2(3S)**

Prerequisite(s): Two senior courses in German and permission of department.

One or two of the following topics will be studied: Die Aufklärung; Lessing; Sturm und Drang; Herder; Goethe; Schiller; Die Romantik; German Drama from Kleist to Brecht; Franz Kafka and Thomas Mann; the German Novelle.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these

courses should contact the department for more information.

GERM 398.3 1/2(3S)
GERM 399.6 1&2(3S)
GERM 498.3 1/2(3S)
GERM 499.6 1&2(3S)

**GRADUATE STUDIES AND
RESEARCH**

College of Graduate Studies & Research

The following GSR courses, which are non-credit courses, are not associated with any specific department, but are available on recommendation by the student's Advisory Committee to all registered graduate students. There are no tuition fees for these courses, provided the student is registered for other courses. Students must officially register for these courses in order to attend. These courses do not reduce the course requirements for a graduate degree.

**GSR 984
Critical-Thinking Skills for Graduate
Students: A Multi-Disciplinary
Perspective
1/2 (3L)**

Course content is based partially on perennial complaints from employers about deficiencies of students in the areas of communication, ethics, and team work, and partly from interviews with a number of people from different disciplines around campus. One aspect of this course, ethics, is receiving serious attention in many professional institutions. Some granting agencies require proof of training in ethical issues before funds will be released.

**GSR 985
Introduction to Ethics and Integrity
1/2(2S/L)**

Introduces principles of ethical decision-making in the contexts of research, teaching, supervision, consultation, and collegial relationships. Covers issues related to integrity in research, ownership of data, and authorship. In co-operation with the Office of Research Services, gives information needed for successful application for university ethics approval of proposed research. Discusses handling of complaints of ethical misconduct. Teaches participants to identify, formulate, and resolve ethical dilemmas following a structured process which includes consultation and reference to professional codes of ethics. The course is intended for beginning graduate students in departments or colleges which do not have their own courses in this field.

**GSR 986
Basic Scientific Glassblowing for
Graduate Students
1/2(2L)**

Designed to introduce researchers to the basic skills of glassblowing. It will include a study of the physical and chemical properties of glass, how to present acceptable drawings and specifications to a skilled glassblower and provide the student with sufficient technical ability to construct and repair a simple glass vacuum system.

GSR 988

**Laboratory Animal Care
1/3(Total 16L-6P)**

Deals with the basic principles of laboratory animal care. It is designed for graduate students in the biological sciences, research scientists and support personnel. This course is mandatory for all graduate students, who in the judgement of their Advisory Committee, will use animals in their programs or future careers.

GSR 989

**Introduction to University Teaching
1/2(3L-1P)**

Designed for individuals who have no formal preparation in university teaching. It focuses on the core activities of teaching, examines their relevance, and illustrates how they are best accomplished. Practical application of the core activities to the student's field of specialization is emphasized.

GREEK

Department of History, College of Arts & Science

For information on relevant programs see Classics in the College of Arts & Science section of the *Calendar*.

GREEK 112.3

**Greek for Beginners I
1(5L)**

An introduction to the fundamentals of ancient Attic Greek, in which the student learns the basic forms of nouns and verbs and rudimentary syntax.

GREEK 113.3

**Greek for Beginners II
2(5L)**

Prerequisite(s): GREEK 112.

An introduction to the more advanced elements of the grammar and syntax of ancient Attic Greek.

GREEK 202.3

**Intermediate Greek I
1(3L)**

Prerequisite(s): GREEK 113.

Grammar review and introduction to continuous prose texts. Prose composition.

Note: The department recommends a minimum grade of 75 per cent in GREEK 113 for students enrolling in this course.

GREEK 203.3

**Intermediate Greek II
2(3L)**

Prerequisite(s): GREEK 202.

Readings in continuous prose texts. Introduction to poetry and Greek metrics. Prose composition.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

- GREEK 398.3 1/2(3S)
- GREEK 399.6 1&2(3S)
- GREEK 498.3 1/2(3S)
- GREEK 499.6 1&2(3S)

HEALTH

College of Education

HLTH 100.3

**Health Concepts for
Elementary/Middle Years Teachers
1/2(3L)**

Provides prospective teachers with the health content which they will need to teach health to students in grades one to nine. Areas include physical health; environmental health; nutrition; healthy sexuality; family relationships; drug education and choices in health care.

Note: Students with credit for Health Sciences 120.3 may not take this course for credit.

**HEALTH CARE
ADMINISTRATION**

Department of Management and Marketing,
College of Commerce

See also Health Care Administration courses listed under Commerce in this section of the *Calendar*.

New applicants will not be admitted to this major nor will Health Care Administration courses be scheduled in 2002-2003.

HCA 400.6

**Honours Seminar in Health Care
Administration
1&2(3S)(Not offered in 2002-2003)**

Prerequisite(s): Admission to the Honours program.

Directed readings and individual research in the areas of health care administration. The major course requirement involves the preparation of an Honours research paper under the supervision of one or more faculty (Honours Advisors) in the particular area of specialization. The resulting Honours paper is normally presented at a department seminar.

HEALTH SCIENCES

College of Kinesiology

H SC 120.3

**Personal Health and Lifestyles
1/2(3L-1P)**

Prerequisite(s): Intended for students who wish to enter the College of Education Elementary/Middle Years programs as well as the direct entry TEPS and Elementary HEd.

A multidisciplinary health course that introduces and addresses topics relevant to personal health and lifestyle choices. Presents health topics that are current, topical and relevant to all university students. Topics may include food, nutrition, exercise, fertility and contraception, environmental issues, stress and mental health, and consumerism and commercial thinking.

Note: Arts & Science, Kinesiology, and Pharmacy & Nutrition students may not take this course for credit.

Department of Physiology, College of Medicine

For details on the B.Sc. in Physiology see the College of Arts & Science.

**H SC 208.6 (Formerly PHSIO 212)
Human Body Systems
1&2(3L)**

Prerequisite(s): BIOL 110 and CHEM 112. Introduces the major organ systems of the human body and how they work.

Note: Students with credit for BIOL 217 and 218, PHSIO 212 or ANAT 105 may not take this course for credit.

**H SC 350.3 (Formerly PHSIO 350)
Integrative Neuroscience
2(3L)**

Prerequisite(s): HSC 208 or ANAT 202 or 210.

Mechanisms of integration of neural signals. Examples will be used to show how different types of sensory input are integrated at various levels of the nervous system to evoke appropriate effector responses.

Note: Students with credit for PHSIO 349 may not take this course for credit.

HEBREW

Department of Religious Studies, College of Arts & Science

For information on relevant programs see Classics and/or Religious Studies in the College of Arts & Science section of the *Calendar*.

**HEB 111.6
Introductory Hebrew Grammar
1&2(3L)**

Hebrew grammar. Translation from Hebrew into English of selected Old Testament passages.

**HEB 201.6
Translation of Hebrew Prose
1&2(3L)**

Prerequisite(s): HEB 111.

Translation from Hebrew into English of *Judges* 2-4, 6-9, 17-18; II *Samuel* 9-20.

**HERD MEDICINE AND
THERIOGENOLOGY**

GRADUATE COURSES

Department of Large Animal Clinical Sciences, College of Graduate Studies & Research

**HMT 801.3
Principles of Embryo Transfer
1/2(1L-1S) and 1,2&3(2P)**

Prerequisite(s): Permission of the instructor.

Covers background information on embryo transfer with special emphasis on bovine embryo transfer. Specialized techniques e.g. embryo freezing, sexing, and splitting will be reviewed and in some cases form parts of laboratory exercises. Laboratory exercises will be conducted primarily on cattle. These will include superovulation, artificial insemination, embryo collection and transfer, and embryo handling

techniques. Designed to provide the student with sufficient knowledge and laboratory experience to conduct the entire procedure in one species.

**HMT 803.6
Special Field Experiences
1/2(40P, 4 weeks)**

Must be full time and of at least one month's duration. Purpose is total immersion in the area of study pertinent to the graduate student. For example, a student studying feedlot diseases of cattle would spend at least a full month in residence at a recognized acceptable feedlot. A complete report is required and should come from a daily log of activities and be organized from a protocol set up by the students' advisory committee prior to going out on this experience.

**HMT 860.3
Advanced Equine Reproduction
1/2(L-P)**

Prerequisite(s): HMT 460; or equivalent and permission of the instructor.

Consists of lectures and seminars on equine reproduction. Candidates will present seminars on selected topics covering reproductive biology of the brood mare and stallion, reproductive diseases and management of brood mare farms.

**HMT 861.3
Advanced Bovine Reproduction
1/2(R-P)**

Prerequisite(s): HMT 460; or equivalent and permission of the instructor.

Clinical aspects of male and female breeding soundness evaluation. Laboratory exercises in embryo transfer, and semenology.

**HMT 871.3
Exotic Animal Medicine
2(3L-3P)**

Prerequisite(s): D.V.M. degree or equivalent.

Provides graduate training in several aspects of veterinary management of exotic animals including reproduction and game farming. Practical training is included, and is a major component of the course. Emphasis will be placed on capture, restraint, examination and treatment of wild animals commonly found in zoos and wildlife parks. Preventive medicine programs will be discussed for the major specie groups. Laboratories will consist of demonstrations and field trips.

**HMT 878.3
Spermatology
1/2(2L-1S-2P)**

Prerequisite(s): Permission of the instructor.

An advanced course in normal and abnormal spermatogenesis and spermatology with emphasis on the bovine species. It includes prenatal and postnatal development of the testis, pubertal changes, detailed study of the cycle of the seminiferous epithelium, semen collection, evaluation and cryopreservation.

**HMT 882.3
Programmed Preventive Medicine
1/2(1P-1S)**

Application of preventive measures to disease control in the herd. Epidemiological parameters specifically applied to a species with the goal of preventing disease in a herd

thus increasing the herd productivity on an economically sound basis. Weekly seminars will be given by the candidates with emphasis on clinical case presentations.

HMT 898.3/899.6
Special Topics
1&2(3R)

A study of a special topic related to the candidate's field of interest.

HMT 990
Seminar in Herd Medicine and
Therigenology

The objective of this seminar course is to give students experience in the critical evaluation of research methods and results. Attendance of these seminars is mandatory for all M.Sc., M.Vet.Sc. and Ph.D. students throughout their programs. Students are required to make at least one presentation each year of their program to discuss their planned and completed research projects.

HMT 992.6
Project

Students undertaking the project Master's degree (M.Vet.Sc.) must register in this course.

HMT 994
Research

Students writing a Master's thesis must register for this course.

HMT 996
Research

Students writing a Ph.D. thesis must register for this course.

HISTORY

Department of History, College of Arts & Science

Six 100-level credit units fulfill your history program requirements, while an additional 100-level 3 credit units may be used as a junior elective in meeting your degree requirements. Only 9 credit units may be taken for credit at the introductory (100-level).

Introductory Courses (100-level)

The department offers 100-level survey courses dealing with major historical periods and developments. In addition to the study of basic information, students examine conflicting interpretations and historiographical debates on controversial issues, and the diverse scholarly methods used by historians in their study and interpretation of the past. Six credit units earned in any of these courses fulfill the prerequisite for the study of history in any 200-level course.

Instruction normally consists of three hours of lectures a week, and one hour of tutorial instruction in which documents are examined, historical and historiographic issues are discussed, and advice is given on the preparation of essays. Tutorials are designed to help students sharpen their analytical skills and improve their oral expression. The preparation of essays is designed to help students define and demonstrate an understanding of important

themes, to develop their research skills, and to improve their command of written English.

ANCIENT AND MEDIEVAL HISTORY

HIST 110.3
Landmarks of Ancient History
1/2(3L-1T)

Themes of Near Eastern history; Greek and Hellenistic experiments in politics and thought; Rome from city-state to world-state; Christianity in a pagan world.

Note: Students with credit for HIST 114 may not take this course for credit.

HIST 111.3
Landmarks of Medieval History
1/2(3L-1T)

The heirs of Rome; Charlemagne; Vikings, Magyars and the rise of feudalism; peasant life; Islam and the Crusades; the rise of France; the twelfth century renaissance; the Holy Roman Empire; the age of Pope Innocent III; medieval women; castles and cathedrals; the late middle ages.

Note: Students with credit for HIST 114 may not take this course for credit.

HIST 114.6
The Ancient and Medieval World
1&2(3L-1T)

Landmarks of Near Eastern history; Greek and Hellenistic experiments in politics, empire and thought; Rome from city-state to world state; Christianity in a pagan world; heirs of Rome; Charlemagne; Vikings, Magyars and the rise of feudalism; peasant life; Islam and the Crusades; the Holy Roman Empire and the Papacy; medieval women; chivalry, castles and cathedrals.

EUROPE

HIST 120.6 (Formerly 112)
The History of Europe from the
Renaissance to the Present
1&2(3L-1T)

A survey of significant forces in modern Europe from the 15th century; the shaping of the modern world; the concentration of political power and the expansion of Europe in the 17th and 18th centuries; the liberal experiment in the 19th century; the 20th-century dilemma.

HIST 121.3
Europe's Way to the Modern Age,
1348-1789
1/2(3L-1T)

The Black Death; Renaissance and Reformation; the wars of the seventeenth century; the rise of modern science; the agricultural revolution; the Enlightenment.

Note: Students with credit for HIST 112 may not take this course for credit.

HIST 122.3
Europe in the Age of Mass Culture,
1789 to the Present
1/2(3L-1T)

Population growth; the age of political revolutions; Romantics and Liberals; nationalism and socialism; the industrial revolution; towards gender equality; the two World Wars and the Cold War; towards economic and political integration.

Note: Students with credit for HIST 112 may not take this course for credit.

GREAT BRITAIN

HIST 140.6 (Formerly HIST 115)
A Survey of British History
1&2(3L-1T)

An introduction to history through the peoples of the British Isles from Roman to modern times. A broad political narrative of dynastic, constitutional, religious, economic, military, and imperial events, as well as social analyses of family and gender relations, work and industrial change, and cultural and intellectual developments.

EAST ASIA

HIST 148.6 (Formerly HIST 117)
East Asia in Modern Times
1&2(3L)

The cultural and political developments of East Asia (mainly China and Japan) from the beginning of the 17th century to modern times; the European presence in this region and the interactions between European and East Asian traditions during this period.

CANADA

HIST 150.6 (Formerly HIST 116)
Canadian History for the Indian
Student from Earliest Times to the
Present
1&2(3L-1T)

Special attention is given to the role of the Indian in this general survey of Canadian history that examines French and Loyalist political traditions, Confederation, the development of a national political life, the rise of staple trades, problems of transportation, economic diversification, and changes in society.

Note: Open only to students registered in the ITEP program. Students with credit for HIST 150 may not take HIST 151 or 152 for credit.

HIST 151.3
Canadian History from the
Pre-Contact Period to 1867
1/2(3L-1T)

A survey of the history of Canada from the pre-contact period until 1867, emphasizing social, cultural, economic, political, constitutional, and external policy developments.

Note: Students with credit for HIST 150 and/or 206 may not take this course for credit.

HIST 152.3
Post-Confederation Canada
1/2(3L-1T)

A survey of the history of Canada since Confederation, emphasizing social, cultural, economic, political, constitutional, and external policy developments.

Note: Students with credit for HIST 150 and/or 206 may not take this course for credit.

THE AMERICAS

HIST 170.6 (Formerly HIST 113)
The Americas
1&2(3L-1T)

A comparative exploration of the history of Canada, the United States, and Latin

America from Pre-Columbian societies to the present, focusing on ethnic and class conflict, gender roles, slavery, the role of religion and the struggle for democracy.

THEMATIC HISTORY

HIST 180.3
History of Industrialization
1/2(3L-1T)

A survey of industrialization in world history, 1750-present, with a focus on how particular societies and cultures were transformed by industrial growth beginning in Britain and later in western and eastern Europe, North America, Japan, and to varying degrees in other countries of the world.

Senior Lecture Courses (200-level)

Lecture and lecture-tutorial courses at the 200-level are designed to provide more detailed examination of a subfield within one of the survey areas, and a more advanced and detailed discussion of conflicting interpretations and the historiographical debates on issues, themes and developments within that historical subfield.

The Department offers a judicious mix of subfields, which may be defined along national/political, chronological, or thematic lines. The subfields are fairly general, and the instruction is designed to offer greater depth of coverage and to develop a better sense of the varieties of history and of the context for the events studied than the instruction given in the first year courses.

Instruction normally consists of either three hours of lectures a week or two hours of lectures a week and one hour of tutorial instruction in which documents or assigned readings are examined, and historical and historiographical issues are discussed. The preparation of essays is an integral part of all these courses. In their essays students are expected to define and demonstrate an understanding of major historical themes, develop research skills, and improve their command of written English.

* Denotes courses with a terminal date of 1815 or earlier.

ANCIENT AND MEDIEVAL HISTORY

***HIST 200.6 (Formerly HIST 203)**
The History of Greece
1&2(3L)

Prerequisite(s): 6 credit units in history at the 100-level or 6 credit units from the Department of Classics.

Minoans and Mycenaeans; the Dark Age; political and intellectual experiments of the Archaic Age; Persian Wars; the rise and fall of the Athenian empire; Athenian democracy; Greek thought, featuring historiography; the trials of city states and the rise of Macedon; Alexander and the Hellenistic world; Greece and Rome.

***HIST 201.6 (Formerly HIST 204)**
History of Rome
1&2(3L)

Prerequisite(s): 6 credit units in history at the 100-level or 6 credit units from the

Department of Classics.

Etruscan, Greek and Italian neighbours; society and politics in the Roman Republic; creation of an Italian federation and a Mediterranean empire; failure of the Republic; Augustus and the advent of monarchy; the Roman Empire, with emphasis on its constitutional, social, military and ideological fabric; paganism and Christianity; Rome's decline; historiography.

***HIST 202.3
The Formation of Europe 300-1000
1/2(3L)**

Prerequisite(s): 6 credit units in history at the 100-level.

A history of the West from the Christianization of the Roman Empire in the fourth century to the foundation of the Holy Roman Empire in the tenth century. Themes include: the survival of Romanitas, monasticism and the western Church, the barbarian kingdoms, the Carolingian Renaissance, and the rise of feudalism.
Note: Students with credit for HIST 212 may not take this course for credit.

***HIST 205.3
Europe and the World in the High
Middle Ages, 1000-1300
1/2(3L)**

Prerequisite(s): 6 credit units in history at the 100-level.

Cluny and the Gregorian reform; the rise of feudal monarchy; Byzantium, Islam and the Crusades; twelfth century renaissance; universities and scholasticism; new forms of religious life; the peasantry; medieval women; the Holy Roman Empire and the Papacy; castles and cathedrals; feudal monarchies.

Note: Students with credit for HIST 212 may not take this course for credit.

***HIST 211.3
The Byzantine Empire, 330-1453
1/2(3L)**

Prerequisite(s): 6 credit units in history at the 100-level.

An introduction to the empire, centered on Constantinople, which dominated much of the Near East for a thousand years after Rome. Themes include religious and cultural developments; the relations between Byzantium and the Latin West; the Islamic world; the Crusades; Byzantium and the political and cultural development of eastern Europe.

***HIST 213.6 (Formerly HIST 251)
Medieval England, 1000-1460
1&2(3L)**

Prerequisite(s): 6 credit units in history at the 100-level.

Studies elements in the political and constitutional history of medieval England and considers the relevance for the 20th century of documents such as Magna Carta, and emphasizes the cultural achievements of the period and examines the ways of life of the common people.

EUROPE

**HIST 220.6 (Formerly HIST 210)
Russian History from the 9th Century
to the Present
1&2(3L)**

Prerequisite(s): 6 credit units in history at the 100-level.

The formative influences on Russian history; unification and expansion of the country; developments in the political, social and economic structure. Russia's relationship with the West; the connection between the Soviet period and earlier developments; the collapse of the Soviet Union in 1991 and post-Soviet Union Russia.

***HIST 225.6 (Formerly HIST 214)
The Age of Renaissance, 1300-1555
1&2(3L)**

Prerequisite(s): 6 credit units in history at the 100-level.

The waning Middle Ages - Renaissance and Reformation. Black Death, economic recovery and overseas expansion. The Hundred Years' War, the fall of Constantinople and the empire of Charles V. Renaissance thought and art; the impact of printing; social and religious protest. Outstanding individuals: Joan of Arc, Petrarch, Columbus, Copernicus, Machiavelli, Leonardo, Erasmus, Luther.

***HIST 226.6 (Formerly HIST 216)
Early Modern Europe, 1555-1715
1&2(3L)**

Prerequisite(s): 6 credit units in history at the 100-level.

Europe from the Peace of Augsburg to the death of Louis XIV; political, religious and social unrest and conflict in the age of power. Special attention will be paid to the development of French government, institutions and culture.

***HIST 227.6 (Formerly HIST 217)
The Age of European Revolution,
1715-1815
1&2(3L)**

Prerequisite(s): 6 credit units in history at the 100-level.

A study of the Old Regime in Europe, the American Revolution and its relationship to European history, the French Revolution, and the Napoleonic period. The changes in methods of warfare, the industrial revolution in England and Europe, and intellectual changes accompanying this period of crisis will be discussed.

**HIST 228.6 (Formerly HIST 218)
Europe in the 19th Century,
1815-1914
1&2(3L)**

Prerequisite(s): 6 credit units in history at the 100-level.

The impact of the forces of nationalism, liberalism, democracy, industrialization and socialism; an analysis of the European balance of power, the rise of national states, the broadening of the base of government, the development of capitalism, extension of European control, and the causes of World War I.

**HIST 229.6 (Formerly HIST 219)
Europe in the 20th Century
1&2(3L)**

Prerequisite(s): 6 credit units in history at the 100-level.

The legacies and problems of the late 19th century and the shaping of the 20th-century world. The First World War and the Russian Revolution; the rise of totalitarianism, the League of Nations, the Great Depression and the Second World War; post-war Europe, elements of the Cold War, Europe and the colonial world, international diplomacy of the great powers.

GREAT BRITAIN

***HIST 242.6 (Formerly HIST 253)
Early Modern Britain, 1460-1760
1&2(3L)**

Prerequisite(s): 6 credit units in history at the 100-level.

From Reformation through civil war in three kingdoms to the emergence of Great Britain as an imperial power, this course examines the intersections of social, economic, intellectual, cultural and political history through local and regional history, family and gender relations, and dynastic and parliamentary affairs.

**HIST 243.6 (Formerly HIST 255)
Modern British Social History, 1760
to the Present
1&2(3L)**

Prerequisite(s): 6 credit units in history at the 100-level.

The history of the first modern industrial society; urbanization, democratization and class conflict; the rise of the labour movement, the triumph of middle-class values, the decline of the aristocracy; the changing religious and moral climate; the domestic consequences of world power; the social and economic impact of two world wars, the loss of world power.

**HIST 244.6 (Formerly HIST 256)
British Imperialism in Asia, Africa,
and the South Pacific
1&2(3L)**

Prerequisite(s): 6 credit units in history at the 100-level.

The slave trade; paramountcy in India; Afghan and Burmese wars; opium wars and the opening of China; missionaries, traders and convicts in the South Pacific; Boer and British in South Africa; "New Imperialism" and the partition of Africa; Sepoy Rebellion, nationalism, Gandhi, and independence for India; roots of African independence.

EAST ASIA

***HIST 248.6 (Formerly HIST 238)
History of China and Japan to 1800
A.D.
1&2(3L)**

Prerequisite(s): 6 credit units in history at the 100-level.

A study of the development of Chinese and Japanese cultures from earliest times to 1800, discussing various characteristics of these two cultures and the many institutions which originated in these two countries.

**HIST 249.6 (Formerly HIST 237)
China and Japan in the 20th Century
1&2(3L)**

Prerequisite(s): 6 credit units in history at the 100-level.

A study of the political, social, economic and cultural development of China and Japan in the twentieth century with substantial emphasis on the importance of these two nations in international politics.

CANADA

***HIST 250.6 (Formerly HIST 224)
Canada and Colonial Neighbours
before 1800
1&2(3L)**

Prerequisite(s): 6 credit units in history at the 100-level.

Focuses on the colonies of Canada and Acadia in an imperial context and explores their relations with neighbouring colonies, especially the New England colonies, New York, Newfoundland, and the West Indies, as well as neighbouring Indian peoples.

**HIST 252.3
Canadian Political History,
1800-1900
1/2(3L)**

Prerequisite(s): 6 credit units in history at the 100-level.

A survey of nineteenth-century Canadian political history, emphasizing the emergence and development of parties, political leadership, creation and evolution of a federal system, and the clash of ethnic, regional, class, and religious interests.
Note: Students with credit for HIST 208 may not take this course for credit.

**HIST 254.3
Canadian Political History,
1900-Present
1/2(3L)**

Prerequisite(s): 6 credit units in history at the 100-level.

A survey of twentieth-century Canadian political history, emphasizing political leadership, emergence of new parties, the threat of Quebec separatism, and other regional tensions.

Note: Students with credit for HIST 208 may not take this course for credit.

**HIST 257.3
History of Canadian Prairies to 1911
1/2(3L)**

Prerequisite(s): 6 credit units in history at the 100-level.

A study of Rupert's Land and the North-West to the early 20th century, including early contact between European and Aboriginal societies, the development, expansion, and decline of the fur trade, early western communities, environmental changes, Canadian expansionism and national development policies, regional responses, and developments leading to provincehood.

Note: Students with credit for HIST 209 may not take this course for credit.

HIST 258.3
History of Canadian Prairies in the 20th Century
 1/2(3L)

Prerequisite(s): 6 credit units in history at the 100-level.

An examination of the three prairie provinces, including the impact of the two World Wars and the Depression, protest movements and parties, urban growth and the modernization of rural life, environmental disasters and new resource developments, Aboriginal renewal, and western alienation.

Note: Students with credit for HIST 209 may not take this course for credit.

HIST 259.3
Canadian Women's History from the Pre-Contact Period to 1918
 1/2(3L)

Prerequisite(s): 6 credit units in history at the 100-level.

Examines the history of Canadian women from the pre-contact period until the end of World War I, emphasizing the complexities of women's experiences and the interplay of such factors as gender, class, race and ethnicity. Employs chronological and thematic approaches while also making reference to historical debates and historiographical developments.

HIST 260.3
Canadian Women's History from 1919 to the Present
 1/2(3L)

Prerequisite(s): 6 credit units in history at the 100-level.

Examines the history of Canadian women from the end of World War I to the present, emphasizing the complexities of women's experiences and the interplay of such factors as gender, class, race and ethnicity. Employs chronological and thematic approaches while also making reference to historical debates and historiographical developments.

HIST 261.3
Canadian-American Relations from the Pre-Contact Period to the 20th Century
 1/2(3L)

Prerequisite(s): 6 credit units in history at the 100-level.

Examines political, economic, social, cultural and diplomatic aspects of Canadian-American relations from the pre-contact period until 1900. Employs chronological and thematic approaches while also making reference to historical debates and historiographical developments.

Note: Students with credit for HIST 221 may not take this course for credit.

HIST 262.3
Canadian-American Relations from 1900 to the 20th Century
 1/2(3L)

Prerequisite(s): 6 credit units in history at the 100-level.

Examines political, economic, social, cultural and diplomatic aspects of Canadian-American relations from 1900 to the present. Employs chronological and thematic approaches while also making

reference to historical debates and historiographical developments.

Note: Students with credit for HIST 221 may not take this course for credit.

HIST 263.6 (Formerly HIST 222)
The Canadian North
 1&2(3L)

Prerequisite(s): 6 credit units in history at the 100-level.

A survey of the history of northern Canada (north of 60): the northern environment and aboriginal peoples; the search for the North-West passage; whaling and the fur trade; Klondike Gold Rush and northern sovereignty; police, missionaries and the Hudson's Bay Company; Diefenbaker's northern vision and the Cold War; northern pipelines, territorial self-government and native land claims.

HIST 264.3
Introduction to the History of Native-Newcomer Relations to 1880
 1/2(3L)

Prerequisite(s): 6 credit units in history at the 100-level.

A survey of relations between indigenous peoples and immigrants to Canada from the 15th century to 1880, emphasizing early fur trade, religious, military, and civil interactions.

Note: Students with credit for HIST 223 may not take this course for credit.

HIST 265.3
Introduction to the History of Native-Newcomer Relations, 1880-Present
 1/2(3L)

Prerequisite(s): 6 credit units in history at the 100-level.

A survey of relations between Natives and newcomers to Canada from the creation of the modern Department of Indian Affairs to the present, emphasizing assimilative policies, political resistance and organization, land disputes, and Aboriginal involvement in constitutional discussions.

Note: Students with credit for HIST 223 may not take this course for credit.

THE AMERICAS

HIST 270.6 (Formerly HIST 231)
The American Colonies and the United States
 1&2(3L)

Prerequisite(s): 6 credit units in history at the 100-level.

European background of American history; the establishment of the colonies and development of an American nationality. The Revolution, the formation of the Union and the struggle to maintain it. The Civil War and the emergence of modern America; the 20th century and America's rise to world power.

HIST 271.6 (Formerly HIST 233)
Modern Latin American History
 1&2(3L)

Prerequisite(s): 6 credit units in history at the 100-level.

A survey of Latin American history, briefly discussing colonial society and the struggle for independence, but concentrating on the modern period. The course focuses on the conflict between the elite and folk/native cultures; the reasons

for continued poverty and unrest, militarism, repression, dependency, revolution, and debt.

THEMATIC HISTORY

HIST 280.6
Intellectual History of Modern Europe
 1&2(3L)

Prerequisite(s): Completion of 30 credit units at the university.

The conflict between freedom and authority from the 12th to the 20th centuries will be used as a focus for the study of the reactions of European thinkers to the problems of the world around them. Both proponents and opponents of political and economic freedom, social equality, religious liberty and toleration, and the freedom of inquiry will be discussed.

HIST 281.6
Military History
 1&2(3L)

Prerequisite(s): 6 credit units in history at the 100-level.

The evolution of modes of warfare from the Renaissance to the present. Military and naval strategy and tactics, civilian-military relations, weaponry, and military organization are included. Military history is interwoven with general history and particular attention is paid to the social and political aspects of militarism.

***HIST 283.3**
Society and the Rise of Science: From the Renaissance to the Industrial Revolution
 1/2(3L)

Prerequisite(s): 6 credit units in history at the 100-level or 6 credit units in any natural science.

A study of the development of science in the context of social, political and intellectual change between the Renaissance and the end of the 18th century. Special attention will be paid to the Copernican Revolution, Renaissance technology, the tension between science and religion, and the early Industrial Revolution.

HIST 284.3
Society and the Rise of Science: From the Industrial Revolution to the 20th Century
 1/2(3L)

Prerequisite(s): 6 credit units in history at the 100-level or 6 credit units in any natural science.

A study of the development of science and its interaction with social, political and intellectual change from the Industrial Revolution to the present. The relationship between science and technology in the Industrial Revolution, the transition from alchemy to chemistry, the Darwinian achievement, and the impact of science on the modern world.

HIST 285.6
Christianity in Europe from 1500 to 1965
 1&2(3L)

Prerequisite(s): 6 credit units in history at the 100-level.

An examination of the development of Christian denominations in Europe from

1500 to 1965. Topics will include the Protestant Reformation, the Catholic or Counter-Reformation, the challenges of the English and French Revolutions, overseas missionary activity, major church councils, and the impact of scientific discoveries.

HIST 287.3
Origins and Development of Co-operatives in Europe
 1/2(3L)

Prerequisite(s): 6 credit units in history at the 100-level and/or social science.

The origins of co-operative enterprises in working-class, lower-middle-class, and farm communities in response to European industrialization in the nineteenth and twentieth centuries; the development of co-operative movements in Britain, France, Germany, Scandinavia, and eastern Europe to the present day; the history of co-operative ideas.

Note: Students with credit for HIST 286 may not take this course for credit.

HIST 288.3
Co-operatives in the World
 1/2(3L)

Prerequisite(s): 6 credit units in introductory history and/or social science

The spread of co-operative enterprises outside Europe; the development of co-operative movements in the United, States, Canada, Japan, India, China, Africa, and Latin America; the world co-operative movement; the challenges of co-operatives and development; co-operatives and new social movements in the world today.

Note: Students with credit for HIST 286 may not take this course for credit.

HIST 289.6 (Formerly HIST 234)
History of Development and Underdevelopment in the Third World
 1&2(3L)

Prerequisite(s): 6 credit units in history at the 100-level or permission of the department.

Examines economic and social change in selected countries of Latin America, Africa, and Asia from the establishment of the European colonial system to the present. A comparative approach is employed to examine the possibilities and results of different economic policy choices in an historical context.

Reading Courses (300-level)

These are junior seminars featuring major historical and historiographical issues. They are primarily directed readings courses rather than lecture courses, though some courses combine seminar discussions with lectures. In all these courses students are required to do assigned reading and then come to class prepared to discuss critically various themes, issues, events and conflicting historical interpretations. The preparation of written work is an integral part of these courses. Permission of the department must be obtained before enrolling in these courses.

ANCIENT AND MEDIEVAL HISTORY

***HIST 300.3 (Formerly HIST 398)
The Roman Senate from Tiberius to Nero
1/2(3S)**

Prerequisite(s): 6 credit units in history or classics at the 200-level.

Ancient evidence and modern scholarship are used in a study of the Roman Senate and senatorial class from the death of Augustus to the fall of Nero (14-68).

***HIST 301.3 (Formerly HIST 399)
The Severan Emperors of Rome, 193-235
1/2(3S)**

Prerequisite(s): 6 credit units in history or classics at the 200-level.

Ancient evidence and modern scholarship are used in a study of the conduct and policies of the emperors from Septimius Severus to Severus Alexander.

***HIST 309.3 (Formerly HIST 313)
The Crusades and their Aftermath
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

Examines the socio-economic pressures and spiritual goals basic to the Crusades, military encounters, the organization of the Latin Kingdom of Jerusalem (1099-1291), and ensuing contacts between Christians and Muslims to the eighteenth century.

EUROPE

**HIST 324.3 (Formerly HIST 310)
Nationalism and the Nationalities of the Soviet Union
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level or Russian 314 and 317.

Concentration on the nationalistic developments of the non-Russian peoples of the Soviet Union. Stresses the impact of the Soviet nationalities policy on the Finns, Estonians, Latvians, Lithuanians, Ukrainians, Jews and the Uzbeks.

**HIST 325.3
European Imperialism in Africa, 1830-1936
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

Selected topics in the history of European imperialism in Africa from the French invasion of Algeria in 1830 to the Italian invasion of Abyssinia in 1935.

**HIST 326.3
Imperialism in Asia, 1840-1945
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

Selected topics in the history of empire building in the Near East, Southern Asia, and the Far East, from the Opium War of 1840 to Japan's bid for empire in the 20th century.

**HIST 327.3
Russian Revolution and the Early Soviet State: 1879-1929
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

The Russian Revolution in broad perspective: includes revolutionary

movements of the nineteenth century, the emergence of Marxism, political and socioeconomic crises of the late tsarist regime, World War I and the February Revolution, Bolshevik seizure of power in October 1917, the Russian Civil War, and Lenin's establishment of the Soviet state.

**HIST 328.3 (Formerly HIST 311)
Stalinism
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

Examines Stalin's rise to power, collectivization and industrialization policy of 1928-1933, the 1934 Congress of Victors, the death of Kirov and the Purge Trials of 1935, Stalin and World War II, Stalin and the Jews, Stalin and the arts, including literature and cinema, and the Stalinist legacy from 1953 to the present.

***HIST 329.3 (Formerly HIST 314)
German History in the Age of Reformation, 1500-1555
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

An initial study of the German political, economic and intellectual scene will enable students to interpret selections from Luther's writings and records of major Reformation debates. Documents on the Peasants' War and Anabaptist writings will be among the evidence chosen to illustrate the impact of the Reformation on German society.

***HIST 330.3 (Formerly HIST 315)
Humanist Thought in Renaissance Italy, 1300-1527
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

A reading course in the development of Renaissance Humanism from Petrarch to Machiavelli. Topics will include the cult of the classics, the Greek revival, new trends in education, civic humanism, and Renaissance philosophy, history and political thought.

**HIST 332.3 (Formerly HIST 318)
German History, 1789-1870
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

The impact of the French Revolution and Napoleon, the rise of nationalism, liberalism and radicalism. Austro-Prussian dualism, the revolution of 1848, the wars of Bismarck, and the unification of Germany.

**HIST 339.3 (Formerly HIST 319)
German History, 1871-1945
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

The Second Reich, its position in Europe and the outbreak of the First World War. The revolution of 1918-19, the Weimar Republic and the rise of Hitler. The Nazi regime and the Second World War.

GREAT BRITAIN

***HIST 340.3 (Formerly HIST 352)
Early Modern Towns in Britain and Europe: 1500-1750
1/2(3S)**

Prerequisite(s): 6 credit units in history at

the 200-level.

What was it like to live in an early modern town? In exploring the social history of small and medium-sized towns in Britain and Europe, this course stresses both the particularity of selected urban communities, and a common urban culture that cut across national and religious bounds.

***HIST 343.3 (Formerly 353)
Living in London: The Early Modern Metropolis, 1500-1760
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

The social history of early modern London through recent historiography and contemporary eye-witness accounts, from the aggregate analysis of historical demographers to the personal reflections of diarists. How did the size, expansion, and dynamism of London affect those who lived there? What was life like in early modern London?

***HIST 344.3 (Formerly HIST 353)
Social and Cultural History of Early Modern Britain
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

Selected topics in English and Scottish history, 1500-1750: i.e. religion and the state; rural society; civil war and revolution; family and household; consumerism; the union of England and Scotland; war and empire; women's lives.

***HIST 345.3 (Formerly HIST 354)
Politics, Protest and Rebellion in England, 1689-1789
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

An examination of the Revolution Settlement and the tensions it created. The emphasis will be on the social and political pressures in British society, the growth of parties, the Jacobite rebellions, and the relationships between city and country during the early Industrial Revolution.

**HIST 346.3 (Formerly HIST 356)
Women in the Workplace: England 1780-1920
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

Women's participation in the Industrial Revolution and its implications. The home, the factory and other female workplaces. The effect of social and cultural differences among women. Changing views of femininity, masculinity and the gendered division of economic, social and psychological roles.

**HIST 347.3 (Formerly HIST 357)
Feminism and Society: England 1790-1945
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

The emergence of modern feminist ways of rethinking womanhood and manhood. The challenge of politics and the public sphere. Sexuality, morality, medicine, education, welfare and socialism as particular issues where feminism made a difference.

EAST ASIA

***HIST 348.3 (Formerly HIST 337)
History of China to 960 A.D.
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

A study of Chinese history from the beginning of Chinese civilization to the end of the Five Dynasties (907-960 A.D.), stressing the evolution of cultural and political institutions under various dynasties.

***HIST 349.3 (Formerly HIST 338)
History of China, 960-1644
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

A study of Chinese history during the second imperial age, from the Sung Dynasty (960-1279) to the end of the Ming Dynasty (1368-1644), stressing the evolution of the Chinese empire during this period.

CANADA

***HIST 350.3 (Formerly HIST 302)
The Conquest of Canada in Perspective, 1715-1815
1/2(3S)**

Prerequisite(s): 6 credit units in Canadian history at the 200-level.

The British conquest of 1759-1763 assessed primarily in terms of its effect upon French Canadian society. Historical interpretations of this central event in Canadian history will form the core of study.

**HIST 351.3 (Formerly HIST 375)
Canadian Social History from 1800 to 1914
1/2(3S)**

Prerequisite(s): 6 credit units in Canadian history at the 200-level.

Examines the social history of Canada from 1800 to 1914, considering the impact of such factors as class, gender, ethnicity, race, and regionalism. Employs chronological and thematic approaches while also making reference to historical debates and historiographical developments.

**HIST 355.3
Canadian Social History from 1914 to the Present
1/2(3S)**

Prerequisite(s): 6 credit units in Canadian history at the 200-level.

Examines the social history of Canada from 1914 to the present, considering the impact of such factors as class, gender, ethnicity, race, and regionalism. Employs chronological and thematic approaches while also making reference to historical debates and historiographical developments.

**HIST 358.3 (Formerly HIST 303)
The Nationalist Awakening of French Canada, 1800-1850
1/2(3S)**

Prerequisite(s): 6 credit units in Canadian history at the 200-level.

Examines the early development of French Canadian nationalism in a difficult period of social and economic change, its expression in political agitation and thwarted rebellion, and its eventual compromise with English Canada in the 1840s.

**HIST 359.3 (Formerly HIST 304)
French-English Relations in Canada,
1840-1918
1/2(3S)**

Prerequisite(s): 6 credit units in Canadian history at the 200-level.

Examines recurring controversies in French-English relations from the sectionalism of the Union period to the conscription crisis of World War I. The economic, social and political developments underlying these conflicts will also be examined.

**HIST 360.3 (Formerly HIST 305)
French-English Relations in Canada,
1918 to the Present
1/2(3S)**

Prerequisite(s): 6 credit units in Canadian history at the 200-level.

Examines French-English relations since World War I, including evolution of Quebec nationalism between the wars, economic change in Depression and wartime, the Quiet Revolution, the emergence of separatism, and constitutional negotiations from the Victoria Charter onward.

**HIST 361.3 (Formerly HIST 308)
Protest Movements in Canada:
1921-1945
1/2(3S)**

Prerequisite(s): 6 credit units in Canadian history at the 200-level.

An examination of political and socioeconomic protest in Canada between 1921 and 1945 with particular emphasis on the western Canadian experience. Studies protest movements and organizations, new political parties, and incidents of public unrest and violence.

**HIST 362.3
Doing Canadian History
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

An examination of how Canadian history has been presented and interpreted outside the usual academic precincts. Examples include popular history, historic sites and parks, film/video, museums, political rhetoric, and architecture.

**HIST 363.3
The Age of Affluence: A History of
Post-1945 Canada
1/2(3S)**

Prerequisite(s): 6 credit units in Canadian history at the 200-level.

Canadians emerged from World War II confident, optimistic and well-positioned to play a leading role in world events. What happened? Seminar topics devoted to political, social, cultural and economic developments allow students to study the central dichotomy of modern Canadian life—angst in an era of affluence.

THE AMERICAS

**HIST 372.6 (Formerly HIST 334)
Revolution and Social Change in
Latin America
1/2(3S)**

Prerequisite(s): HIST 170 or 271.

Discusses revolution and social change in Latin America ranging from early native protests against colonial rule to current unrest.

**HIST 373.3 (Formerly HIST 335)
Race, Class and Gender in U.S.
History, 1790-1865
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

An examination of the significant social, economic and political developments in the history of the U.S. from the beginning of the New Republic to the end of the Civil War.

**HIST 374.3 (Formerly HIST 336)
Race, Class and Gender in U.S.
History, 1865-1983
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

An examination of major social and political developments in the history of the U.S. from Reconstruction to the early 1980s.

***HIST 376.3 (Formerly HIST 341)
Native Society under Spanish
Colonial Rule
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

The major elements of native society in colonial Latin America, beginning with pre-conquest native culture (Aztec, Mayan, and Incan). The focus is on native revolt, resistance to colonial rule, and the emergence of a new native culture, community, and economy during the three hundred years of Spanish colonial rule in Latin America.

**HIST 377.3 (Formerly HIST 342)
Rural Communities and the State in
Latin America
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

The continuing conflict between rural communities and the state in modern Latin America (1830 to the present) focusing on cultural conflict between “folk” and elite forces, the struggle for land between peasant communities and export agriculture, the failure or successes of agrarian reform, peasant revolt, and cocaine cultivation.

**HIST 379.3
Slavery in the Americas
1/2(3S)**

Prerequisite(s): HIST 270 or 271 or permission of the department.

This course examines the history of slavery in the Americas, comparing the experience in the United States, Brazil, and the Caribbean. Various themes will be examined: the reasons for slavery, the economics of the slave trade, the development of slave society, slave resistance and revolt, opposition to slavery, the abolition of slavery, and the aftermath of slavery.

THEMATIC HISTORY

**HIST 380.3
Computer-Assisted History
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200-level.

Examines how historians use computers. The course discusses the debate over the use of computers in history, investigates resources available to historians on the Internet, and introduces students to the use

of spreadsheets, graphs, and databases in historical study.

**HIST 381.3
Problems in Modern Military History
1/2(3S)**

Prerequisite(s): One of HIST 227, 228, 229, 281 or POLST 360.

Topics will be selected from the tactical, strategic, and technological history of European warfare from the 18th century to the end of the Second World War.

**HIST 383.3
The Scientific Revolution from
Newton to Darwin
1/2(3S)**

Prerequisite(s): HIST 283 and 284 or one of HIST 226, 227, 228, 242, 280 and 6 credit units in the natural sciences.

The scientific and philosophical discovery of the laws of nature from the period of Newton to Darwin. Emphasis will be given to the status of science, the growth of experiment, the relationship between science and technology, and the decline of the mystical view of nature in the 18th and 19th centuries.

***HIST 384.3
WOMEN AND GENDER IN EARLY
MODERN EUROPE
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 200 level.

The course investigates women's lives in Europe from ca. 1500 to ca. 1800, and includes topics such as female life-cycle and sexuality, women's economic and political roles, literary and artistic creations, piety and witchcraft, the development of notions of masculinity and femininity, and the relationship between gender and power.

**HIST 385.3
Selected Topics in Central American
History (Antigua)
1/2(3S)**

Prerequisite(s): 6 credit units in history at the 100-level.

This course, part of the “Antigua, Guatemala Semester Abroad Program,” will examine selected themes in the history of Central America, concentrating on the 19th and 20th centuries. It will take advantage of its location by including guest lecturers from Central America and field trips in Guatemala, Honduras and Belize.

**HIST 390.3 (Formerly HIST 333)
The Cold War and its Historical
Interpretation
1/2(3S)**

Prerequisite(s): HIST 220 or 229 or 244 or 270.

Topics in the history and historical literature of the Cold War from the Wilson-Lenin era to the present, with primary emphasis on the post-1943 period. Major, analytical focus is on the interaction between politics and historical writing, with attention to assumptions, biases and methodology of various writers.

Note: Students with credit for HIST 433 or 490 may not take this course for credit.

**Honours Seminar Courses (400-
Level)**

These are research seminars in which students are required to do some work with primary sources. The discussion of

assigned readings, and the preparation, presentation and criticism of research papers are the main activities. Historical themes and problems are examined in depth. Conflicting historical interpretations and historiography are discussed.

Note: Permission of the department must be obtained.

COLLOQUIUM

**HIST 494.0
Michael Swan Honours Colloquium**

Prerequisite(s): Admission to an honours program in history.

Oral presentation of a historical paper at a conference of Honours students. The presentation is normally based on a paper already prepared, or in preparation, for a third- or fourth-year seminar course.

Note: HIST 494 is required of all Honours students.

Ancient and Medieval History

***HIST 400.6 (Formerly 404) The Age
of Augustus, 44 B.C. - A.D. 14
1&2(3S)**

***HIST 402.3 Aspects of Late
Antiquity 1/2(3S)**

***HIST 403.3 (Formerly HIST 422)
Topics in the History of Early
Medieval England 1/2(3S)**

***HIST 413.3 (Formerly HIST 460)
Dante's Divine Comedy as an
Historical Source 1/2(3S)**

Europe

***HIST 421.3 (Formerly HIST 462)
Erasmus and Renaissance
Humanism 1/2(3S)**

***HIST 423.3 (Formerly HIST 463)
The Search for Religious Toleration
and Church Unity in the 16th Century
1/2(3S)**

***HIST 424.3 (Formerly HIST 466)
Catholic Reform and Counter-
Reformation in Italy, 1540-1650
1/2(3S)**

***HIST 425.6 (Formerly HIST 416)
France in the 17th Century 1&2(3S)**

***HIST 426.6 (Formerly HIST 417)
Politics, Economics and Society in
the Enlightenment 1&2(3S)**

**HIST 427.6 (Formerly HIST 410)
Social and Political Thought in
Russia, 1800-1917 1&2(3S)**

**HIST 428.6 (Formerly HIST 411) A
History of Siberia from the 16th
Century to the Present 1&2(3S)**

**HIST 429.6 (Formerly HIST 418)
Origins of the First World War,
1871-1914 1&2(3S)**

**HIST 435.3 (Formerly HIST 420) The
Nazi State, 1933-1938 1/2(3S)**

***HIST 436.3 Topics in the French
Revolution 1/2(3S)**

**HIST 438.3 (Formerly HIST 420) The
Nazi Catastrophe and its Postwar
Legacies 1/2(3S)**

Great Britain

*HIST 441.6 (Formerly HIST 453)
Selected Problems in 17th-Century
English History 1&2(3S)

HIST 442.6 (Formerly HIST 456)
Imperialism and the Victorians
1&2(3S)

HIST 443.6 (Formerly HIST 457)
Victorian England: Culture and
Society 1&2(3S)

East Asia

HIST 448.6 (Formerly HIST 437)
People's Republic of China 1&2(3S)

Canada

*HIST 450.6 (Formerly HIST 406)
French Canada before 1800 1&2(3S)

HIST 451.6 (Formerly HIST 401)
History of Native-Newcomer
Relations in Canada 1&2(3S)

HIST 452.6 (Formerly HIST 405) The
Canadian North from 1870 1&2(3S)

HIST 458.6 (Formerly HIST 407.6)
Politics and Society in Nineteenth-
Century Canada, 1860-1920 1&2(3S)

HIST 460.6 (Formerly HIST 409) The
Canadian Prairies, 1869-1939
1&2(3S)

HIST 461.6 (Formerly HIST 412)
Canadian Women's History 1&2(3S)

HIST 464.6 History of Canadian
Popular Culture 1&2(3S)

The Americas

HIST 471.6 (Formerly HIST 431) The
United States in the Nuclear Age
1&2(3S)

Thematic History

HIST 480.6 Historical Method
1&2(3S)

*HIST 483.6 Science and Revolution,
1640-1790 1&2(3S)

HIST 490.6 (Formerly HIST 433) The
Cold War 1&2(3S)

*Note: Students may not take both HIST 390
and 490 for credit.*

SPECIAL TOPICS

These courses are offered occasionally by
visiting faculty and in other special
situations. Students interested in these
courses should contact the department for
more information.

HIST 298.3 1/2(3L)

HIST 299.6 1&2(3L)

HIST 398.3 1/2(3S)

HIST 399.6 1&2(3S)

HIST 498.3 1/2(3S)

HIST 499.6 1&2(3S)

GRADUATE COURSES

Department of History, College of Graduate
Studies & Research

**HIST 801.3 Studies in Ancient and
Medieval History 1/2(3S)**

**HIST 820.6 Themes in Early Modern
European History 1&2(3S)**

**HIST 821.3 Studies in Early Modern
European History 1/2(3S)**

**HIST 830.6 Themes in Modern
European History 1&2(3S)**

**HIST 831.3 Studies in Modern
European History 1/2(3S)**

**HIST 840.6 Themes in British and
Imperial History 1&2(3S)**

**HIST 841.3 Studies in British and
Imperial History 1/2(3S)**

**HIST 848.6 Themes in Asian History
1&2(3S)**

**HIST 849.3 Studies in Asian History
1/2(3S)**

**HIST 850.6 Themes in Canadian
History 1&2(3S)**

**HIST 859.3 Studies in Canadian
History 1/2(3S)**

**HIST 860.6 Themes in Western
Canadian History 1&2(3S)**

**HIST 861.3 Studies in Western
Canadian History 1/2(3S)**

**HIST 870.6 Themes in the History of
the Americas 1&2(3S)**

**HIST 871.3 Studies in the History of
the Americas 1/2(3S)**

HIST 880.3 History of History 1/2(3S)

HIST 881.3 Historiography 1/2(3S)

**HIST 882.3 History Beyond
Documents 1&2(3S)**

HIST 892.3 Applied History 1/2(3S)

HIST 898.3 Special Topics 1/2(3S)

HIST 899.6 Special Topics 1&2(3S)

**HIST 990
Seminar
2(1.5S-1.5R)**

Students and faculty will make
presentations concerning their current
research. All candidates for a graduate
degree must make one presentation.
Attendance is required throughout the
graduate program.

**HIST 994
Research**

Students writing a Master's thesis must
register for this course.

**HIST 996
Research**

Students writing a Ph.D. thesis must
register for this course.

HOME ECONOMICS

Department of Curriculum Studies, College
of Education

**HED 111.3
The Family Ecosystem
1(3L)**

An introduction to the study of families
from a family ecosystem perspective. This
explores personal and familiar
relationships, individual and collective
relationships with the environment,
decisions about developing and allocating

resources, and the local, national and
global impact of these decisions.

**HED 142.3
The Consumer
2(3L)**

An introduction to the study of individual
and family consumer decision making.
Involves a study of: advertising and other
factors which influence consumer decision
making; consumer rights and
responsibilities; the reciprocal influence
between the consumer and the marketplace;
and the impact of consumerism locally,
nationally, and globally.

**HED 222.3
Environments for Living: A Family
Perspective
1(3L-3P)**

An introduction to family housing
environments. Involves a study of: housing
alternatives for Canadians: housing needs
regarding basic shelter; safety; finances;
handicaps; special needs; housing policies;
aesthetics; culture; personal expression;
and the relationship among housing,
family, and the environment.

**HED 223.3
Contemporary Clothing and Textile
Consumption
1(3L-3P)**

An introduction to the consumption of
clothing and textiles. Involves a study of
common textiles and finishes used in
apparel and the home, fibers, yarns, and
fabric construction, performance and care,
factors affecting selection including
economic, socio-psychological, cultural,
aesthetic, wardrobe planning, apparel
construction and fit, special needs and
marketplace options.

**HED 232.3
Personal and Family Financial
Management
1(3L-3P)**

A study of the economic resources of
individuals and families. Income, wealth,
employee benefits, credit, mortgages,
pensions and wills are examined along with
issues related to financial security, income
assistance and budgeting. Spending
decisions of a family at the various stages
of the family will also be examined.

**HED 313.3
Family and Technology
1(3L-3P)**

A sociotechnology model is used to
examine household use and impact of
technology from past to present, the
relationship among family, technology and
society, current issues/concerns regarding
technology and the family; and strategies to
enable individuals and families make more
informed decisions regarding household
technologies.

**HED 411.3
Family Politics
1(3L-3P)**

Prerequisite(s): HED 111 and 142

A study of families including family
myths/biases/stereotypes, family formation,
communication, changing roles, life
stages/transition periods, resource
management, medical/health issues, abuse,
impact of home and marketplace work,
reciprocal influence between social

institutions and families, family policy
needs, current issues and trends, and
community resources and support
networks.

**HED 431.3
Management of Family Time and
Food Resources
2(3L-3P)**

*Prerequisite(s): HED 111, 222, 223, and
232 or permission of the department head
for any deficiencies in the 200-level
courses.*

An exploration of the decisions that
individuals and families make about
developing and allocating time and food
resources. Involves an understanding of
concepts such as goals, resources,
planning, decision-making, implementing;
changing family resource management
concerns over the life cycle; and specific
management concerns for different family
structures.

HUMAN RESOURCES

Department of Industrial Relations and
Organizational Behaviour, College of
Commerce

See also Human Resources courses listed
under Commerce in this section of the
Calendar.

**HRM 400.6
Honours Seminar in Human
Resource Management
1&2(3S)**

*Prerequisite(s): Admission to the B.COMM
Honours program.*

Directed readings and individual research in
the areas of human resource management.
The major course requirement involves the
preparation of an Honours research paper
under the supervision of one or more faculty
(Honours Advisors) in the particular area of
specialization. The resulting Honours paper
is normally presented at a department
seminar.

INTERDEPARTMENTAL COURSES

Department of Medicine, College of
Medicine

**INTDL 201.0
Cardio-Pulmonary Resuscitation
1 PA**

Provides a basic level of knowledge and skill
in first aid and basic cardiac life support.

**INTDL 202.1
The History of Medicine
1 PA**

Addresses the historical basis of medical
science, the evolution of clinical medicine,
the aspects of health care, including that in
Canada and Saskatchewan. Instructional
methods will include lectures, seminars,
and tutorials.

**INTDL 204.6
Life Cycle and Humanities
1&2 PA**

Examines the facts, principles, and
concepts of normal physical and
psychological growth, of development, and
of aging. At each stage of the life cycle,

common characteristics and adaptational problems are discussed.

**INTDL 205.6
Professional Skills A
1&2 PA**

Provides medical students with the opportunity to develop a wide array of skills upon which they will build throughout their professional lives. The development of effective, appropriate and satisfactory relationships with patients is fundamental to the success of this course and all future clinical experience. Various associated skills will be introduced as well: information management and critical thinking, financial management, practice management, etc. The Community Experience is a compulsory part of this course.

**INTDL 303.12
Interdepartmental Clinical Systems I
1&2 PB**

Provides an interdisciplinary approach to diseases involving the major organ systems. With input from clinical, diagnostic and basic science departments, students will learn the pathogenesis and pathophysiology of specific diseases, the signs and symptoms of patients presenting with these diseases, and the diagnostic and therapeutic principles required for patient management. The following body systems will be covered: Hematology/Oncology, Female Reproductive, Kidney and Male Genitourinary, Gastrointestinal, Cardiovascular, Respiratory and Endocrine.

**INTDL 304.12
Clinical Sciences I
1&2 PB**

Through direct student/patient interaction and small group tutorials, stresses the refinement of basic clinical skills, the physician/patient relationship, and will introduce diagnostic and therapeutic strategies. Interdepartmental course with rotations through the clinical departments of Medicine, Medical Imaging, Surgery and its subspecialties, Pediatrics and Obstetrics & Gynecology.

**INTDL 390.6
Medical Student Research I**

**INTDL 391.3
Literature Review I**

**INTDL 392.6
Medical Student Research II**
These form part of the B.Sc.(Med.) program. They comprise the first and second components of a supervised research project.

**INTDL 393.3
Literature Review II**

These form part of the B.Sc.(Med.) program. A guided reading program which will provide background knowledge for students research project.

**INTDL 395.6
Undergraduate Thesis and Research
Seminar Presentation**

Forms part of the B.Sc.(Med.) program. Involves a preparation of a formal undergraduate research thesis based on

research experience. The thesis will be presented to peers and faculty at a formal research seminar.

**INTDL 403.6
Interdepartmental Clinical Systems II
PC**

Provides an interdisciplinary approach to diseases involving the major organ systems. With input from clinical, diagnostic and basic science departments, students will learn the pathogenesis and pathophysiology of specific diseases, the signs and symptoms of patients presenting with these diseases, and the diagnostic and therapeutic principles required for patient management. The following body systems will be covered: Neurology, Dermatology and Rheumatology.

**INTDL 404.6
Clinical Sciences II
PC**

Through direct student/patient interaction and small group tutorials, stresses the refinement of basic clinical skills, the physician/patient relationship, and will introduce diagnostic and therapeutic strategies. Interdepartmental course with rotations through the clinical departments of Geriatrics, Neurosciences, Psychiatry and Rehabilitation Medicine.

**INTDL 405.6
Interdepartmental Clinical Linking
Courses
PC**

Provides basic principles, concepts and knowledge necessary for clerkship training in the areas of Anaesthesia, Art of Medicine, Healthcare Ethics, Law and Medicine, Medical Imaging, Neonatology, Ophthalmology, Orthopedics and Otolaryngology.

**INTDL 502.0
Elective
PD (12 weeks)**

A wide choice of electives by subject and location is allowed. This elective period allows students to broaden their medical education and to explore in-depth future career opportunities.

**INTDL 503.0
Postclerkship Selective
PD (4 weeks)**

A wide selection of options by subject and location will be allowed within these courses. The selective period allows students to broaden their medical education or to explore in-depth future career or research areas.

SPECIAL TOPICS

The courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

INTDL 398.3 1/2(3S)

INTDL 399.6 1&2(3S)

INTDL 498.3 1/2(3S)

INTDL 499.6 1&2(3S)

SPECIAL TOPICS

Special topic courses that are offered by the various departments in the College of

Medicine. These provide students with opportunities to study areas of special interest.

MEDSP 598.3

MEDSP 599.6

GRADUATE COURSES

Department of Medicine, College of Graduate Studies & Research

**INTDL 810.3
Principles and Applications of
Electron Microscopy
1&2(3P)**

Prerequisite(s): Permission of the instructor.

Work will include specimen preparation, ultramicrotomy, study of the principles and practice with the use of the microscope and related equipment, and evaluation and interpretation of electron micrographs.

INTERDISCIPLINARY STUDIES

College of Arts & Science

Interdisciplinary Studies courses are taught occasionally as Special Topics courses. These courses are interdisciplinary in nature or are team-taught by faculty from several departments.

SPECIAL TOPICS

INTST 298.3 1/2(3S)

INTST 299.6 1&2(3S)

INTST 398.3 1/2(3S)

INTST 399.6 1&2(3S)

INTST 498.3 1/2(3S)

INTST 499.6 1&2(3S)

GRADUATE COURSES

College of Graduate Studies & Research

**INT D 898.3/899.6
Special Topics**

Topics will be selected according to the student's specific area of interest.

**INT D 990
Seminar**

Students are required to attend and to present at least one seminar each academic term.

**INT D 992.6
Project**

Students taking the project Master's degree must register in this course.

**INT D 994
Research**

Students writing a Master's thesis must register in this course.

**INT D 996
Research**

Students writing a Ph.D. thesis must register in this course.

INTERNATIONAL STUDIES

International Studies, College of Arts & Science

**INTNL 200.6
International Studies
1&2(3L)**

Prerequisite(s): 18 credit units at the 100-

level including at least 12 credit units at the 100-level from two or more of the departments participating in the International Studies program (Anthropology and Archaeology, Economics, Geography (Human), History, Political Studies and Sociology).

An examination of selected international issues in interdisciplinary perspective. Theoretical and methodological contributions of the social sciences and history to international studies. Fields of specialization within international studies, including development studies, international relations and conflict resolution, and area studies.

**INTNL 385.3
Latin American Studies
1/2(3S)**

Prerequisite: Attendance at the Guatemala Term Abroad.

Offered as part of the Antigua, Guatemala Term Abroad. Specific course topics will change on each occasion it is offered, but will typically cover a range of interdisciplinary topics focused on Guatemala, Central America, and Latin America.

**INTNL 388.3/389.6
Independent Research
1/2(1S), 1&2(1S)**

Prerequisite(s): Permission of the International Studies Administrative Committee and the project supervisor.

International Studies offers senior students the opportunity to do an interdisciplinary Independent Research course. This will be most attractive to students away from the university on study trips. Research projects and topics must be approved by the International Studies Administrative Committee.

**INTNL 400.6
Honours Seminar in International
Studies
1&2(3S)**

Prerequisite(s): Fourth year standing in the International Studies Program or permission of the Chair of the International Studies Program.

Discussion of the nature and utility of major approaches to the understanding of international behaviour, and the development of an interdisciplinary and integrated perspective of contemporary international relations.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the program coordinator or administrative committee for more information.

INTNL 298.3 1/2(3S)

INTNL 299.6 1&2(3S)

INTNL 398.3 1/2(3S)

INTNL 399.6 1&2(3S)

INTNL 498.3 1/2(3S)

INTNL 499.6 1&2(3S)

KINESIOLOGY

College of Kinesiology

KIN 121 and 122 are prerequisites for all KIN courses.

**KIN 121.3
Functional Effects of Physical Activity
1(3L-P)**

In surveying the functional effects of physical activity the course will examine strength development and training, anaerobic training, aerobic training, flexibility, diet, and other selected factors. Physical growth patterns of children and the stages of motor development will be surveyed with particular emphasis on age and sex differences. Laboratory experiences will be provided to supplement the lectures.

**KIN 122.3
Social Behavioral Foundations of
Physical Activity
2(3L)**

Introduction to the basic concepts and topics associated with the behavioral aspects of physical activity. The focus is basic principles of motor learning and the social psychology of sport. A brief introduction to cultural aspects of physical activity in Canada is also presented along with current issues.

**KIN 145.3
Foundational Basis for School
Physical Education Programs
1/2(3L)**

Introduction to basic concepts and topics associated with the philosophical, functional, psycho-social, and motor skill acquisition aspects of physical activity. Emphasizes the application of these concepts to the instruction of physical education of elementary and middle years aged children.

Note: Students with credit for either KIN 121.3 or KIN 122.3 may not take this course for credit and should consult with a Program Advisor about appropriate course replacement. B.Sc.(Kin.) students may not take this course for credit.

**KIN 212.3
Introduction to Dance
1/2(3L)**

An introduction to the various dance forms of today including the nature and origins of each dance form, the influence of music on the dance, dance as an art form, dance in religion and dance in education.

**KIN 213.3
History and Origins of Dance
1/2(3L)**

A historical survey of dance from primitive times through pre-Christian civilization, the middle ages, the Renaissance, the Golden Age of Ballet and including the emergence and development of Modern Dance.

**KIN 222.3
Biomechanics I
1/2(3L-1P)**

Prerequisite(s): MATH 101 and STATS 103 (or MATH 110 and MATH 116).

A study of the principles of statics and dynamics related to human motor performance in exercise and sport.

Systematic methods for analyzing simple and complex motor skills are presented.

**KIN 223.3
Contemporary Health Issues for
Students
1/2(3L)**

Provides a forum for the discussion of vital health issues relevant to students. The importance of personal behaviour as it relates to one's health, and particularly to the health of others, will be examined as will global concerns, such as environmental and sociological issues, which can ultimately affect health. Students will develop the necessary skills to seek out and evaluate health information so they will be able to make wise choices for themselves and others regarding health issues that have implications throughout life.

Note: Students require a Kinesiology Computer Laboratory account for this course.

**KIN 225.3
Introductory Exercise Physiology I
(3L/2P)**

An introductory course on the effects of physical activity on specific physiological systems. Specific emphasis will be placed on the basic aspects of skeletal muscle and neural physiology.

**KIN 226.3
Introductory Exercise Physiology II
(3L/2P)**

Prerequisite(s): KIN 225.

Continues to study the effects of physical activity on basic physiological function and systems. Special emphasis will be placed on the basic aspects of cardiovascular and respiratory function.

**KIN 231.3
Social Psychological Foundations of
Physical Activity
1/2(3L)**

Explores individual human behaviour in a physical activity context. The emphasis will be placed upon understanding social-psychological concepts as they relate to the physical activity setting.

**KIN 232.3
Sport in Society
1/2(3L)**

Introduces the sociology of sport and challenges students to think critically about sport in Canadian society. Topics include the emergence of modern sport in Canadian society, politics and sport, commercial aspects of sport, social inequality and sport, and violence in sport.

**KIN 233.3
Historical and Comparative Physical
Education and Sport
1/2(3L)**

A historical and comparative study of the role, significance, and extent of sport and physical education in Canadian society and a series of selected cultures. The development and significance of sport and physical education in the U.S.A., the Germany, Sweden, and China will also be studied.

Note: Students require a Kinesiology Computer Laboratory account for this course.

**KIN 240.3
Movement and Movement Education
1/2(3L)**

A study of the movement concepts of body awareness, space awareness, effort qualities and relationships, as the basis of movement theory is undertaken. Emphasis is placed upon integrated movement concept development through observation and experimentation.

**KIN 245.3
Foundational Basis for Instructional
Strategies in Physical Activity
1/2(3L)**

Prerequisite(s): KIN 145.

Develops knowledge and strategies relating to the instruction of physical activity. Oriented specifically towards integrating material on how children and adolescents learn motor skills with the effective presentation of material.

Note: B.Sc.(Kin.) students may not take this course for credit.

**KIN 255.3
Program Planning and Design for
Leisure and Sport
1/2(3L)**

Provides students with the basic information required to successfully plan a leisure or sport program for a variety of agencies and target groups. In an effort to address the changing demographic trends that influence leisure and sport programs, focus will be on needs assessments of clients, resource implications, short- and long-term planning.

**KIN 320.3
Physical Growth and Development of
Children
1/2(3L)**

Prerequisite(s): KIN 225 and 226.

Deals with the physical changes that occur during the growth period in children. The implications of changes in structure and function as they relate to education, exercise and physical activity will be discussed. Topics include the relationship of growth to physiological function, strength and motor performance, exercise and growth, secular trends, variations in puberty and the assessment of growth by anthropometric techniques.

Note: Students require a Kinesiology Computer Laboratory account for this course.

**KIN 321.3
Prevention and Care of Sports,
Recreational and School Injuries
1/2(3L-2P)**

Prerequisite(s): CPR or KINAC 211, and ANAT 221.

Acquaints the student with the common types of athletic injuries that are encountered in Canadian athletic competitions, the methods for their prevention, the methods of treatment and the rehabilitative procedures that can be safely employed by the physical educator in order to enable the athlete to return to competition with maximum safety.

**KIN 322.3
Human Movement: Performance,
Learning and Development
1/2(3L-2P)**

Prerequisite(s): STATS 245 or PL SC 314.

An overview of the theoretical basis of human movement control, acquisition and development. Lectures address motor control theory, phases and theory of motor skill acquisition and childhood motor development. Laboratories emphasize the method of science and applied use of statistics to demonstrate theoretical concepts.

Note: Students require a Kinesiology Computer Laboratory account for this course.

**KIN 334.3
Theory of Coaching
1/2(3L-P(T.B.A.))**

Prerequisite(s): Restricted to senior B.Sc.(Kin.) students.

Designed to provide the student with an appreciation and understanding of the theory and practice of coaching. Students will look at the development of techniques of communication between the coach, individuals and/or groups as they relate to team organization and integration. There will be a development of the concept that coaching is a specialized form of teaching.

Note: Students require a Kinesiology Computer Laboratory account for this course.

**KIN 345.3
Foundational Basis for Motor Skill
Development
(3L)**

Prerequisite(s): KIN 145

Develops an understanding of principles of motor skill development in elementary and middle years children. Opportunities will be provided for observation and application of these principles in a variety of school settings.

Note: B.Sc.(Kin.) students may not take this course for credit.

**KIN 346.3
Instructional Techniques and
Strategies in Motor Skill Acquisition
1/2(3L)**

Prerequisite(s): KIN 322.

Emphasizes the instructional techniques and strategies for effective learning in physical education. Focuses on the learning of motor skills and the schema of instructional presentation. Lectures and student activity will include topics such as clarity of presentation, effective content development, management, feedback and the analysis of instruction with observation tools.

**KIN 355.3
Program Management and
Implementation for Leisure and
Sport
1/2(3L-P)**

Prerequisite(s): KIN 255.

Provides students with a systematic framework for considering the role of the program manager in implementing leisure and sport programs and for specific target groups. Management concepts such as organizing, controlling, leading and evaluation will be discussed.

**KIN 390.3
Research Methods in Kinesiology
2(3L)**

Prerequisite(s): STATS 245 or PL SC 314 ; admission to the honours program or by permission.

This course provides an introduction to research methods and design used in

kinesiology research. The course will focus on critical evaluation of research studies and the use of various types of research methods with emphasis on the sport and physical activity context.

**KIN 412.3
Dance Practicum
1&2(P)**

Involves practical experience in the teaching of dance resulting in a short presentation of work accomplished.

**KIN 420.3
Adult Fitness and Exercise
Management
1/2(3L-2P)**

Prerequisite(s): KIN 225 and 226.
Presents basic theoretical and advanced practical information related to prescription, development and assessment of physical activity and lifestyle as an underlying theme. Students will have the opportunity to complete C.S.E.P. (Canadian Society for Exercise Physiology) Certified Fitness Consultant theory and practical examinations.

**KIN 423.3
Physical Activity for Persons with an
Impairment
1/2(3L)**

Prerequisite(s): KIN 222, 225, 226, 321 and 322.

Focuses on physical activity programs for persons with impairments. Current trends in Canadian physical activity program philosophy and delivery are considered in concert with the more general philosophy and delivery systems for persons with impairments. Basic adapted physical activity principles focusing on activity, program and instructional modification are also considered.

Note: Students require a Kinesiology Computer Laboratory account for this course.

**KIN 424.3
Aging and Activity: Physical
Education for Older Adults
1/2(3L-1.5P)**

Prerequisite(s): KIN 225 and 226.

Will focus on exercise programming for older adults with respect to understanding the biology of aging as it affects potential for physical activity in later years. Emphasis will be on the special and changing needs of older adults and the adaptations to traditional exercise modalities necessary to ensure success in "active living."

**KIN 425.3
Physiology of Exercise
2(3L-2P)**

Prerequisite(s): KIN 225 and 226.

Examples of topics to be discussed include exercise and altitude, exercise and heart disease, women and exercise, etc. Laboratory sessions will include both formal laboratories and an approved student designed research project which will be reported to the class upon completion.

**KIN 426.3
Health Aspects of Physical Activity
and Physical Fitness
1/2(3L)**

Prerequisite(s): KIN 225 and 226.

A comprehensive review of current knowledge regarding the effects of physical activity and physical fitness on physical and mental health. Additional topics include exercise and aging, cost/benefit of physical activity and risks of exercise.

**KIN 428.3
Nutrition, Drugs and Physical Activity
1/2(3L-2P)**

Prerequisite(s): KIN 225 and 226.

Examines the effects of nutritional intake and drug usage on physical performance. Preparation for competitive or recreational activities demands an understanding of: (1) the nutritional requirements which underpin such activity, and (2) the major consequences that ingestion of performance enhancing drugs may have upon the health and physical achievement of an individual.

Note: Students require a Kinesiology Computer Laboratory account for this course.

**KIN 429.3
Exercise and Cardiac Rehabilitation
1/2(2L-2P)**

Prerequisite(s): KIN 420 and 470 (may be taken concurrently); PATH 205 and PHISO 346 are recommended.

Primarily a practicum course in cardiac rehabilitation. Students will intern within the tri-hospital cardiac rehabilitation program offered through Saskatoon District Health. The major emphasis of this course is the role of exercise in cardiac rehabilitation.

Note: Students wishing to enroll in this course must apply at Room 413, Williams Building.

**KIN 432.3
Ethics and Values in Sport and
Physical Activity
1/2(2L-1S)**

Prerequisite(s): Restricted to senior students who, in the year of registration in this course, have no more than 42 credit units remaining to complete the B.Sc.(Kin.).

Students will be introduced to a number of decision making models which guide the ethical decision making process. Contemporary issues and controversies from the behavioural, functional, educational and management areas of physical activity will be examined from an ethical and moral perspective.

Note: Students require a Kinesiology Computer Laboratory account for this course.

**KIN 442.3
Biomechanics II
1/2(3L-P)**

Prerequisite(s): KIN 222.

This is a second level biomechanics course which provides students an opportunity to further their study in both the qualitative and quantitative aspects of sport biomechanics.

**KIN 445.3
Advanced Readings and Special
Studies in Kinesiology
1&2(R)**

Restricted to senior students who have a strong background and wish to pursue planned study in a special phase of physical education. Students wishing to pursue a special area of study are required to present in writing a detailed description of the proposed study to a college faculty member with expertise in that area. The faculty member may then wish to sponsor the study by requesting approval from the Associate Dean.

**KIN 458.3
Organizational Issues in Leisure and
Sport Management
1/2(3L)**

Seminar course which increases the ability of the student to understand and analyze organizational issues and become effective leisure and sport managers. Emphasis will be placed on the theoretical and practical issues of the distinctive nature of leisure and sport organizations, initiating programs for target groups, managing and leading change, and organizational effectiveness.

**KIN 470.3
Fitness Appraiser Practicum
1&2(1L-3P)**

Prerequisite(s): KIN 222, 225, 226, 321, 322 and 420 (or Corequisite(s)).

Provides practical experiences in a wide variety of advanced physical fitness assessment methods applicable to sport, general public and occupational settings. *Note:* Students wishing to enroll in this course must apply at Room 413, Williams Building.

**KIN 471.6
Administration Practicum
1&2(P)**

Prerequisite(s): Open to senior students with the permission of the instructor.

Students will be involved in assigned field experience equal to 10 hours per week for one complete term. In addition, a monthly group seminar will be held to discuss programs and problems related to the field experience. Provides for practical field experience in the administration of sport and leisure programs. Will be under the direction of college staff and competent community authorities.

Field Experience: Students will be assigned to work with leisure services boards, intercollegiate athletic boards, amateur sport associations or special games committees. Work done will be evaluated by the college staff and the professional in the field.

Note: Students wishing to enroll in this course must apply at Room 413, Williams Building.

**KIN 475.3
Information Technology for Leisure
and Sport Management
1/2(3L-P)**

Uses software and hardware technology to solve problems in sport, physical education and leisure management. Laser videodiscs, still frame and video scanners, spreadsheets, word processors, data bases,

dedicated application software and specialized hardware are utilized.

Note: This course is for Leisure and Sport Management students in the B.Sc.(Kin.) program. Students wishing to enroll in this course must apply at Room 413, Williams Building.

Note: Students require a Kinesiology Computer Laboratory account for this course.

**KIN 490.3
Honours Seminar
1/2(3S)**

Prerequisite(s): KIN 390.3; admission to the honours program.

Students will attend presentations, review articles, and prepare materials that will assist them in interpreting and presenting research in exercise and sport science.

**KIN 494.6
Honours Thesis
1/2(3P)**

Prerequisite(s): Registered B.Sc.(Kin.) Honours Program student with a minimum cumulative weighted average of 70% or higher; KIN 390.3.

Corequisite(s): KIN 490.3.

The student will work two terms on a project under a faculty member's supervision; become familiar with the pertinent research literature; establish procedures, collect, record and analyze experimental results; submit to the College a written thesis which incorporates the background to the work done, procedures used, results obtained and a discussion of the results and their significance. The student will present the thesis findings in KIN 490.3 Honours Seminar. Before beginning, the student must submit an outline of the project for approval of the Associate Dean. At the end of the project, the student will submit to the department a journal and a written report in thesis form.

**KIN 498.3
Special Topics
1/2(3L)**

Takes advantage of special circumstances in which one time special topic offerings can be made available to senior students in the College.

GRADUATE COURSES

College of Graduate Studies & Research

**KIN 801.6
Experimental Design and Research
Methods
1&2(3L)**

Emphasizes the scientific method and research techniques as they apply to research in kinesiology. Discussion of the scientific method includes history, basic principles, validity, sampling theory, sources of error, statistical concepts and basic designs. Research techniques involve library searches, computers and research, and data collection.

Note: Compulsory for all M.Sc. students in kinesiology.

Note: Students require a Kinesiology Computer Laboratory account for this course.

**KIN 803.3
Biomechanics
1/2(R)**

Prerequisite(s): KIN 442; or equivalent.
Topics include kinetic measurements, segmental energy and power flow, stresses and strains on human tissue, modeling and simulation.

**KIN 804.3
Behavioural Aspects of Physical Education
1/2(3L)**

Prerequisite(s): KIN 322.
A critical review of behavioural research in the physical activity domain. Emphasis is placed on current theories in the literature.

**KIN 805.3
Physiology of Exercise
1/2(3L)**

Prerequisite(s): KIN 225 and 226; or permission of the instructor.
A reading course for the student interested in a specialized approach to the study of exercise physiology. Detailed papers will be presented by the students in both required and selected areas of exercise physiology. In addition laboratory experiences may be assigned to supplement the assigned readings. General emphasis is placed on the cardiopulmonary response to various types of exercise, but other areas such as the muscle physiology and biochemistry of exercise are considered.

**KIN 806.3
Physical Growth and Development
1/2(3L)**

Prerequisite(s): KIN 320; or permission of the instructor.
Examines special topics related to growth and physiological development. Special emphasis is placed on the influence of exercise, physical activity, and athletic performance on the dynamics of growth. The course consists of special readings and assigned topics dealing with physiological function, exercise tolerance, strength and motor performance as they relate to the growth of the child.

**KIN 809.3
Health Aspects of Physical Activity and Physical Fitness
1/2(3S)**

Involves a comprehensive investigation of the health implications of physical activity and exercise. Topics will include health aspects of exercise as related to current knowledge, gaps in knowledge and research needs.

**KIN 810.3
Psychology of Sport
1/2(3L)**

Prerequisite(s): KIN 231; or equivalent.
Focuses on the contemporary issues of sport psychology emphasizing: presentation of the major issues in sport psychology and presentation of knowledge of both the methods and experimental foundation of sport psychology. Issues to be covered include an overview of sport psychology, competition, competitive anxiety, management of anxiety, motivation, imagery and personality as well as other contemporary concerns as they relate to sport.

**KIN 830.3
Psychosocial Aspects of Health and Exercise Behaviour
1/2(3L)**

Focuses on the psychosocial aspects of health and exercise behavior. An in-depth study and application of theoretical research to practical field settings is a central theme.

**KIN 840.3
Interpreting Research in Physical Activity and Health
1/2(3L)**

Provides students with a basic theoretical and applied knowledge of research methods in physical activity and health. This course will cover the basic concepts of research design, data collection, and data analysis. Using these concepts students will learn to review and critique the literature in physical activity and health.
Note: For students in the PGD program. M.Sc. program students will not receive credit for this course.

**KIN 851.3
Professional Skills Seminar
1&2(2T-6P)**

Designed to develop the professional skills related to physical fitness and physical activity assessment and prescription in a variety of environments; these include a broad spectrum from athletic settings to community or occupational health/fitness programs. Both theoretical and practical issues will be discussed as they arise from ongoing practicum activities.

Note: This is a required course for students in the PGD program. Upon completion of KIN 470, 851 and 852, students will be eligible to write the Canadian Society of Exercise Physiology Certified Fitness Appraiser exam.

**KIN 852.3
Professional Skills Seminar
1&2(2T-6P)**

Designed to develop the professional skills related to physical fitness and physical activity assessment and prescription in a variety of environments; these include a broad spectrum from athletic settings to community or occupational health/fitness programs. Both theoretical and practical issues will be discussed as they arise from ongoing practicum activities.

Note: This is a required course for students in the PGD program. Upon completion of KIN 470, 851 and 852, students will be eligible to write the Canadian Society of Exercise Physiology Certified Fitness Appraiser exam.

**KIN 860.3
Research in Physical Education: Quantitative and Qualitative
1/2(3L)**

Prerequisite(s): EDRES 800; or equivalent
Provides the student with a comprehensive understanding of the findings and implications of research on teaching and instruction in physical education. This course will engage the student in a critical analysis of pedagogical research.

Note: For students in the M.Ed. in physical education pedagogy program. M.Sc.

program students will not receive credit for this course.

**KIN 861.3 Contemporary Issues in Physical Education
1 2(3L)**

Required by students enrolled in the joint M.Ed. program in Physical Education Pedagogy. The purpose of this course is to familiarize the student with the major issues facing the instruction of school-based physical education programs. The intent will be to encourage participants to take a stand on major issues and to support their positions.

**KIN 898.3
Special Topics
1/2(3R/P)**

Studies in selected areas of physical education may be undertaken by advanced students with the consent of the College Graduate Committee. This work consists of essay writing, special readings and reports on assigned topics relating to a common subject or upon a series of laboratory studies.

**KIN 990
Seminar**

Review of related scientific studies. Graduate students are required to attend and present papers during their period of candidacy.

**KIN 994
Research**

Students writing a Master's thesis must register for this course.

**KIN 996
Research**

Students writing a Ph.D. thesis must register for this course.

ACTIVITY COURSES

**KINAC 100.1
Alpine Skiing
(3P)**

An introduction to downhill skiing. Includes equipment and fitting considerations, proper use of tows, and beginning downhill techniques such as the wedge turn, traverse, stem turn and parallel turn. An extra course fee will be charged for lessons.

**KINAC 102.1
Baseball
(3P)**

A survey of the fundamental skills of baseball. Includes coaching techniques and the interpretation of rules.

**KINAC 103.1
Cross Country Skiing
(3P)**

Provides personal experience and skill in the sport of cross country skiing. It will include conditioning, care and selection of equipment, waxing, cross country skiing techniques, emergency procedures, touring, principles of racing and fundamentals of winter survival.

**KINAC 104.1
Curling
(3P)**

A complete survey of the game of curling, including a brief history, delivery of rock,

sweeping, skipping, strategy, rules and courtesies of curling.

**KINAC 105.1
Cycling
(3P)**

An introduction to cycling as a sport.

**KINAC 108.1
Softball
(3P)**

A beginning course in softball covering the basic skills of pitching, hitting, base running, etc. Emphasizes coaching strategy, teaching skills and the history and development of the sport of softball.

**KINAC 110.1
Folk, Novelty and Line Dance
(3P)**

An introduction to the technique and basic dance steps required in folk, novelty and line dance. Also includes an introduction into music, meter and phrasing used in these forms of dance.

**KINAC 112.1
Golf
(3P)**

An introduction to the life time activity of golf. To include history of the game, instruction in the fundamental skills, rules and etiquette of golf, types of competitions and equipment used.

**KINAC 113.1
Ice Games
2/3/4(3P)**

Develops ice skating skills and introduces the students to a variety of ice games suitable for children. Emphasizes games of low organization which may be of interest to the elementary school teacher.

**KINAC 114.1
Kayaking
(3P)**

Prerequisite(s): Grey level Red Cross swimming or equivalent.
Introduces whitewater kayaking. Basic kayaking technique and safety, and the skill of reading whitewater, will be taught.

**KINAC 115.1
Lacrosse
(3P)**

Introduces the original Canadian Indian game. Includes basic skills for each player and introductory strategy and rules.

**KINAC 117.1
Racquetball
(3P)**

Introduces fundamental skills and knowledge of racquetball. Strokes and playing strategies important to understanding the game as a player and spectator will be offered.

**KINAC 120.1
Basketball I
(3P)**

Emphasizes basic individual skill development and knowledge of basketball.

**KINAC 121.1
Soccer
(3P)**

Introduces the fundamental skills, basic strategies, officiating and the methodology for teaching and coaching soccer.

**KINAC 123.1
Squash
(3P)**

Introduces international squash, offering fundamental strokes and strategies for the beginning player.

**KINAC 126.1
Football I
(3P)**

The development of basic individual skills and knowledge of the rules for touch and flag football will be emphasized.

**KINAC 127.1
Hockey I
(3P)**

Basic individual skills will be emphasized.

**KINAC 129.1
Volleyball I
(3P)**

Basic skills will be emphasized.

**KINAC 130.1
Badminton
(3P)**

The basic stroke skills and strategies for singles, doubles and mixed doubles play. Officiating and equipment for play will also be dealt with.

**KINAC 133.1
Social Dance I
(3P)**

Emphasizes personal skill development and knowledge of a variety of traditional and contemporary social dances.

**KINAC 134.1
Athletics Track Events I
(3P)**

Provides the student who does not intend to pursue teaching or coaching Track and Field with an exposure to the running events. Utilizes a 'practical learn-by-doing' approach with some lectures.

**KINAC 135.1
Athletics Field Events I
(3P)**

Provides the student who does not intend to pursue teaching or coaching Track and Field with an exposure to the field events. Utilizes a 'practical learn by doing' approach with some lectures.

**KINAC 136.1
Tennis
(3P)**

Provides the students with a basic three stroke game and offers knowledge of all strokes and playing strategies important to understanding the game as a player, coach and spectator.

**KINAC 138.1
Wrestling I
(3P)**

An introduction to basic wrestling skills. Emphasizes basic personal skill development and knowledge of wrestling.

**KINAC 150.1
Rowing
(3P)**

Introduces rowing as a recreational pursuit and competitive sport. Includes sweeping and sculling techniques, coxing, safety, racing and ergometer training.

Note: Proficiency to the minimum level to that of KINAC 211 is recommended. An

equipment rental fee of \$25.00 will be required from students at the first class meeting.

TWO CREDIT UNIT COURSES

**KINAC 210.2
Introduction to Fundamentals of
Movement and Rhythm
(3P)**

Introduces fundamentals of movement and rhythm. Includes basic movement techniques designed to give the student an understanding of body alignment, body balance and control of the centre.

Note: This is a prerequisite for all other dance activity courses.

**KINAC 211.2
Aquatics
(3P)**

Prerequisite(s): Green/ Lifesaving I or demonstrable equivalent distance swimming (150 meters).

Includes practical and theoretical work. Practical aspects include strokes, life saving, resuscitation and first aid training. Opportunity is provided for earning the Royal Life Saving Society Resuscitation and Life Saving Awards. Pulmonary Resuscitation certification is required. There will be a special fee assessed of approximately \$40.00 for CPR certification. *Note:* Certified Instructors I and II are not required to take PEDAC 211. However, another 2 credit unit activity must be taken in lieu of PEDAC 211.

**KINAC 212.2
Dance (Contemporary)
(3P)**

Prerequisite(s): KINAC 210.

Includes fundamentals of movement, beginning technique for modern dance and beginning dance composition.

**KINAC 213.2
Gymnastics
(3P)**

Designed to provide both practical and theoretical work in the area of introductory gymnastics with special emphasis on material relevant to the secondary school physical education setting. Involves work in most gymnastic apparatus and the Canadian Gymnastics Federation's Level I Coaching Certification (Technical) will be awarded to those completing this course.

**KINAC 220.2
Basketball
(3P)**

An introduction designed to develop knowledge and understanding of the performance of individual basketball skills and basic knowledge of FIBA rules. Minor emphasis on the basic elements of team play. Level I technical certification possible.

**KINAC 226.2
Football
(3P)**

A practical approach to the basic skills involved in competitive football. Such skills as passing, kicking, blocking and tackling will be covered during the class periods. Basic offensive and defensive tactics will also be covered.

**KINAC 227.2
Hockey
(3P)**

Fundamental skill areas of ice hockey are covered with some emphasis on team play.

**KINAC 229.2
Volleyball
(3P)**

Introduces fundamental techniques in the game of volleyball. Includes description of basic individual skills, the development of teaching progressions, skill analysis and correction and current rule interpretations and officiating techniques.

**KINAC 232.2
Dance (Jazz)
(2P)**

Prerequisite(s): KINAC 210.

Included will be the history and development of jazz dance, basic terminology, how to use jazz dancing in an educational setting and basic composition and choreography.

**KINAC 235.2
Track and Field
(3P)**

Introduces basic events of track and field. Develops understanding of the fundamental principles underlying the teaching and execution of each event. A practical approach to develop the ability to demonstrate basic skills. Some coverage of organization and administration in track and field and cross country running. Level I technical certification possible.

**KINAC 270.2
Physical Activity: Applications to
Health
(3P)**

Prerequisite(s): KIN 121.

Enhances students' knowledge of physical activity prescription. The application of specific fitness programming and enhancement of leadership skills in aquafitness, aerobic classes, strength training and other fitness methods will be covered.

Note: Students with credit for PEDAC 311 (last offered in 1996-97) may not take this course for credit.

**KINAC 445.2
Special Studies in Physical Activities
(3P)**

Restricted to senior students who wish to pursue an advanced planned study in a physical activity. Students wishing to pursue a special study area are required to present in writing a detailed description of the proposed study to a college faculty member with expertise in that area. The faculty member may then wish to sponsor the study by requesting approval from the Associate Dean.

THREE CREDIT UNIT COURSE

**KINAC 472.3
Physical Activity Practicum
(3P)**

Prerequisite(s): KIN 334; the appropriate 200-level KINAC course; and permission of the instructor.

Designed for students who wish to specialize in a specific activity. Emphasizes advanced technical considerations and coaching/instructional strategies where applicable.

Note: Students must apply for a placement

in this course by April 1. Applicants will be notified by May 15 regarding the status of their application.

**LAND USE AND
ENVIRONMENTAL STUDIES**

Land Use and Environmental Studies, College of Arts & Science

**LUEST 400.3
Field Training in Environmental
Management
1/2(3S)**

Prerequisite(s): Completion of three years of the Land Use and Environmental Studies program, or permission of the LUEST Administrative Committee.

Land Use and Environmental Studies students will analyze, research and propose solutions to actual problems in environmental management under the direction of professional management personnel and of instructors in the LUEST program. The course will also provide training in field research techniques and report preparation.

**LUEST 401.3
Legal Issues in the Environment
1/2(3L)**

Prerequisite(s): GEOG 280.3 or permission of the LUEST Chair.

This class provides a basic introduction to environmental law for students with a non-legal background. The course explores the legal aspects of environmental protection, environmental offences, constitutional law, environmental impact assessment and environmental audits.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the program chair or administrative committee for more information.

- LUEST 298.3 1/2(3S)
- LUEST 299.6 1&2(3S)
- LUEST 398.3 1/2(3S)
- LUEST 399.6 1&2(3S)
- LUEST 498.3 1/2(3S)
- LUEST 499.6 1&2(3S)

LANGUAGES AND LINGUISTICS

Department of Languages and Linguistics, College of Arts & Science

See courses listed under French, German, Russian, Spanish and Ukrainian in this section of the *Calendar*.

**LARGE ANIMAL CLINICAL
SCIENCES**

Department of Large Animal Clinical Sciences, College of Veterinary Medicine

These courses are restricted to students enrolled in the Doctor of Veterinary Medicine program, unless otherwise stated.

COURSES • Large Animal Clinical Sciences

*Denotes courses open to students in the College of Agriculture.

*LACS 57.3 Principles of Animal Health and Disease 2(3L-3P)

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture

This course will briefly review some of the important principles of animal diseases, disease causing agents, and the animal body disease defense system. A discussion of some common livestock diseases, with an emphasis on prevention through management procedures, will follow. Laboratory demonstrations will include routine procedures for handling, restraint, treatment and animal behaviour. Calculation of the economic loss to a livestock enterprise due to disease will be discussed.

*LACS 200.5 Animal Management and Production I Q1,2(2L-2P),Q4(3L-2P)

Offered jointly with the Department of Animal Science.

Provides a basic foundation of knowledge in the behaviour, husbandry, nutrition and breeding of the common animal species, featuring the veterinary aspects of the various animal industries and the contemporary role of the veterinarian in servicing them. Concepts of herd management, health and production interactions, and the makeup of various animal industries will be emphasized for the various species groups.

Laboratory exercises will emphasize hands-on experience in animal handling and field trips to production facilities. Laboratories will also involve production data analysis, feed evaluations, and exercises relating to genetics of animal breeding.

*LACS 300.5 Animal Management and Production II Q1(3L-2P),Q2,3&4(2L-2P)

Prerequisite(s): Offered jointly by the College of Veterinary Medicine and the Department of Animal Science.

A continuation of Animal Management and Production I.

LACS 400.2 Herd Medicine Q3(2L-2P),Q4(2L)

Covers how the concepts of herd or population medicine can be applied to veterinary practice. Emphasis is placed on five main topics: evaluating clinical trials, choosing diagnostic tests, investigating and resolving outbreaks of disease, managing herd data, and discovering how the concepts of herd medicine might be applied to entire ecosystems. Laboratories are designed to provide students with practical experience evaluating clinical trials and analyzing herd data.

*LACS 411.3 Diseases of Livestock Q3(3L)

Prerequisite(s): Open to students in the College of Agriculture.

Provides an overview of animal disease principles in which disease mechanisms, body response to disease, diagnosis, control and prevention are emphasized.

Special attention is given to infectious diseases of cattle, that are of economic importance to the Saskatchewan livestock industry.

LACS 452.2 Large Animal Surgery Q2(3L),Q3(3L)

A comprehensive course covering the signs, diagnosis, management and treatment of the major surgical conditions in large animals. Covers plastic and reconstructive surgery of the skin, surgery of the respiratory system, digestive system, musculoskeletal system, and the urogenital system. The major emphasis is on the equine and bovine species, but reference is made to other large animal species.

LACS 460.5 Obstetrics and Reproduction (Therigenology) Q2(3L),Q3(3L,3P),Q4(2L-5P)

Covers the normal reproductive patterns of domestic animals, the causes of lowered reproductive efficiency and management of reproductive problems of individual animals and herds. Laboratories are designed to enhance understanding of these aspects of theriogenology and to develop clinical skills including, male and female breeding soundness evaluation, obstetrical management and the diagnosis and treatment of reproductive problems.

LACS 472.4 Large Animal Internal Medicine Q1(4L),Q2,3&4(3L)

A series of lectures which deal with the specific diseases of domestic farm animals (cattle, sheep, goats, and pigs) and horses. Emphasizes the etiology, epidemiology, pathogenesis, clinical and laboratory findings, diagnosis, treatment and control of the common diseases which occur in domestic farm animals. Some lectures deal with the important exotic diseases which are potential threats to the livestock industry.

LATIN

Department of History, College of Arts & Science

For information on relevant programs see Classics in the College of Arts & Science section in the *Calendar*.

LATIN 112.3 Latin for Beginners I 1(5L)

An introduction to the basics of Latin grammar, with particular attention to accidence.

LATIN 113.3 Latin for Beginners II 2(5L)

Prerequisite(s): LATIN 112.

An introduction to the main elements of basic Latin syntax.

LATIN 202.3 Intermediate Latin I 1(3L)

Prerequisite(s): LATIN 113.

Consolidation of basic Latin grammar and introduction to advanced Latin syntax. The readings of some of the less difficult

ancient Latin texts. Minimum of 75 per cent in introductory Latin recommended.

LATIN 203.3 Intermediate Latin II 2(3L)

Prerequisite(s): LATIN 202.

Readings in continuous Latin prose texts. Introduction to Latin poetry and metrics. Latin prose composition.

LATIN 301.3 Medieval Latin 1/2(3L)

Prerequisite(s): LATIN 202 and 203.

Reading of selected texts from either St. Augustine or Boethius; one further text, from later medieval Latin. Only students who have achieved high standing in LATIN 202 and 203 or the equivalent are advised to undertake this course.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

LATIN 398.3 1/2(3S)

LATIN 399.6 1&2(3S)

LATIN 498.3 1/2(3S)

LATIN 499.6 1&2(3S)

LAW

College of Law

FIRST YEAR

LAW 201.6 Contracts 1&2(3L)

An introduction to the law of contracts, including formation of contractual obligations, consideration, privity, contract formalities, capacity, contractual terms, misrepresentation, mistake, illegality, discharge and remedies.

LAW 204.6 Criminal Law 1&2(3L)

Basic concepts and procedures, principles of criminal liability, physical and mental elements of a crime, common law and statutory defences, the *Canadian Charter of Rights and Freedoms*, capacity, justification, parties to offences, and specific offences.

LAW 208.6 Property I 1&2(3L)

A survey of the law of personal property. The forms and methods by which interests in personal property are created, used and transferred. A survey of English land law and its introduction to, and use in, Saskatchewan.

LAW 212.6 Tort Law 1&2(3L)

An introduction to the legal processes through which an injured person can seek compensation either from the state, from insurance schemes or in a tort action. Detailed consideration will be given to the

Saskatchewan Criminal Injuries Compensation Scheme, the tort of negligence, and the *Saskatchewan Automobile Accident Insurance Act*. Preliminary treatment will also be given to civil procedure, ethical issues, and access to justice considerations, together with a critique of Canada's legal response to personal injury.

LAW 231.3 Constitutional Law (Division of Powers) 1/2(3L)

Principles of federalism and of constitutional interpretation. The judicial system. Detailed examination of the distribution of legislative power between Parliament and the Provincial Legislatures. Constitutional amendment. Policy issues will also be addressed.

LAW 233.3 Constitutional Law (Charter of Rights and Freedoms) 1/2(3L)

An examination of the Charter of Rights and Freedoms. Emphasis will be placed on general principles of interpretation and theories of judicial review and human rights, general provisions of the Charter (s. 24, 12, 5, etc.) and issues concerning selected charter rights and freedoms, such as section 2, 7 and 15.

LAW 243.0 Legal Research and Writing 1&2(1L)

An introduction to the methods of legal research and writing. Students will be required to complete a number of legal memoranda as well as bibliographical and research assignments. The first year moot court program forms part of this course.

SECOND AND THIRD YEARS

LAW 302.3 The Sale of Goods 1/2(3L)

Identification and analysis of legal issues related to the distribution of goods in both consumer and commercial contexts. Addresses the practical problems arising in connection with transactions of sale of goods, including problems involving parties to the contract of sale and those involving persons in the chain of distribution who are not in a contractual relationship with one another. The application of the *Sale of Goods Act* and the *Consumer Products Warranties Act* to the resolution of these issues is examined in some detail.

LAW 303.3 Secured Transactions and Negotiable Instruments 1/2(3L)

Prerequisite(s): LAW 302.

The basic features of secured transactions law and negotiable instruments law are examined. Students are given the opportunity to examine, principally in the context of consumer-level credit transactions, the basic concepts and practical application of *The Personal Property Security Act*. In addition, peripheral statutory measures affecting secured transactions such as *The Limitation of Civil Rights Act*, *The*

Saskatchewan Farm Security Act and The Exemptions Act are examined. In the second part of the course, the concept of negotiability is examined in the context of the provisions of the *Bills of Exchange Act*. The practical application of negotiable instruments law are addressed in the context of the banking system.

LAW 326.3

Trusts 1/2(3L)

The creation and administration of the express trust are covered. Resulting or implied trusts are dealt with. The constructive trust, both in its classical form and as a remedial device, is examined. Breach of trust, remedies of a beneficiary and trustees defences are considered. The termination of a trust, both at common law and under statute, is dealt with. The charitable trust is briefly examined.

LAW 331.3

Constitutional Law III 1/2(3L)

This course canvasses important areas of constitutional law that the mandatory first-year course does not address. It examines, *inter alia* current federalism issues, including the social union negotiations; constitutional amendment, including the process or succession; the judicial branch of government, and in particular the impact of the *Judges Reference*; the internationalization of domestic constitutional law and changing notions of sovereignty; and the *Charter's* mobility rights, language rights, and democratic rights. Overall, it identifies underlying themes in constitutional law and explores different approaches to constitutional adjudication.

LAW 340.3

Administrative Law I 1/2(3L)

A survey of the role of administrative agencies within the Anglo-Canadian legal system focusing primarily upon consideration of the extent to which agency and executive action is subject to judicial review and control.

LAW 351.3

Evidence I 1/2(3L)

Examination of the foundations of the law of evidence in civil and criminal trials in Canada. The principles, rules, statutes and procedures are examined from a critical perspective with emphasis on the history, rationale and reform of rules and statutes affecting the admissibility of evidence. The topics examined are admissibility, relevance, character evidence, opinion evidence, hearsay evidence, competence, privilege and confessions.

LAW 361.3

Business Organizations I 1/2(3L)

Examination of the basic features of business corporations. The following topics, among others, are considered: corporate personality, the process of incorporation, the powers and duties of directors and officers, shareholder rights and remedies.

LAW 363.3

Agricultural Law I 1/2(3L)

Prerequisite(s): Successful completion of first year law.

Agriculture is a highly regulated industry in most jurisdictions; Canada and Saskatchewan are no exception. Farmers have historically claimed that common law rules of property and contract do not meet their needs. Governments have seen it to be in their interest to intervene in a way that ensures stability in both the agriculture and consumer communities. The result is a complex set of legal institutions regulating the relationships among farmers and the financial, marketing, and transportation organizations with which Saskatchewan agriculture operates, as well as the relevant federal statutes and the case material interpreting both provincial and federal statutes will be examined.

LAW 372.3

Family Law I 1/2(3L)

Examination of the maintenance and property rights as between husbands and wives and also spousal claims for the maintenance and custody of the children of the marriage on marriage breakdown. These issues are canvassed by having regard to both the federal and provincial legislation in force in the area of family law.

LAW 384.3

Civil Procedure 1/2(3L)

A chronological study of the procedural steps, rules and related substantive law in a civil action from the moment of the decision to sue to the trial of the matter. The context of the adversarial process in an action is examined by reference to the policies underlying civil procedure, the role and authority of the lawyer, the organization and jurisdiction of the courts, limitations of actions and costs. The civil action is examined through a focus on principles of jurisdiction and venue, type and manner of commencement of proceedings, pleadings, multiple claims and parties, and discovery. The course will involve the drafting of documents.

LAW 390.3

Critical Legal Studies 1/2(3L)

This is a "Legal Perspectives" course intended to introduce students to the literature and approaches of what is presently known as "critical legal studies". Major themes developed in the work of "crits" and "fem-crits" include: the artificiality and arbitrariness of formal legal systems, the indeterminacy of rules, the duplicity of the public/private distinction, the use of myths of legal neutrality and objectivity to maintain hierarchy and conditions of social inequality, and the role of images and rhetoric of freedom and equality in obtaining compliance with institutional mechanisms of control and oppression. Many of these themes and problems were previously analyzed by the legal realists.

LAW 392.3

Dworkin and His Critics 1/2(3L)

A "Legal Perspectives" course, examining some of the principle writings of Ronald Dworkin and the leading critics of his views. The course will examine Dworkin's critique of Legal Positivism, his theory of adjudicative decision making and its epistemological underpinnings, and the relationship between legal theory and liberal theories of rights and equality in his writings. Each topic will be examined in the context of the debates between Dworkin and his critics generated by these issues.

LAW 393.3

Feminist Legal Theory 1/2(3L)

This is a "Legal Perspectives" course which examines feminist critiques of law.

LAW 394.3

Jurisprudence 1/2(3L)

A "Legal Perspectives" course examining the nature and function of law, focusing particularly on the relationships between law and society, law and morality and law and political theory.

LAW 395.3

Jurisprudence and Tort Law 1/2(3L)

A survey of jurisprudential theory in the context of the law of torts. Various schools of thought will be examined, including natural law and rights theory, law-and-economics theory, feminist theory, and the critical legal studies movement. Fundamental issues of particular relevance to tort law will also be examined.

LAW 396.3

"Objectivity" in Law 1/2(3L)

This is a "Legal Perspectives" seminar that analyzes the concept of "objectivity" and its role in law. Claims of "objectivity" are routinely made in law for what are purportedly findings of 'fact', either simple or complex, as well as for complex and overtly normative or value-laden determinations of mixed 'fact' and 'law'. This seminar invites the student to develop his or her critical and analytic skills through examination of the theoretical foundation and conceptual framework for such claims. The materials studied will include selections from a variety of writers, including selected materials from the social sciences, epistemology, and ethics. Use will be made of selected legal cases, facts, and case studies to permit discussion of theory as it applies to concrete legal issues. A historical, cross-cultural theoretical perspective will be included and the approaches taken by contemporary writers (legal realist/ feminist/ critical/ liberal/post-maternalist, etc.) will be compared.

LAW 401.3

Securities Regulation 1/2(2L-1R)

Corequisite(s): LAW 361.

An introduction to the principles of securities regulation in Canada and an examination in some detail of the Securities Act 1988 (Saskatchewan) the National Uniform Act and Local Policies,

and General Rulings and Orders. Examines the definitions of key concepts such as "security", "trade", "distribution", "full true and plain disclosure", and "material fact". A historical perspective will provide the starting point, and the basic scheme of the regulatory system will be covered, including registration and prospectus requirements, continuous disclosure, insider trading and reporting, take-over bids, and minority shareholder rights. Special emphasis will be given to the exemptions available for financing activities prior to or instead of a public offering.

LAW 402.3

Interjurisdictional Sales & Financing 1/2(3L)

Prerequisite(s): LAW 302.3 and 303.3.

This course addresses a variety of issues pertinent to such interjurisdictional transactions of sale. The substantive law contained in the *United Nations Convention on Contracts for the International Sale of Goods* is considered in the context of the sale of goods produced principally in Western Canada.

Techniques for the financing of sales will be examined including factoring, forfaiting and leasing. International legal instruments such as the *Ottawa Conventions on Factoring and International Financial Leasing* and the proposed *Uncitral Convention on Assignments in Receivable Financing* will be considered. Methods of payment such as letters of credit and international electronic payment systems will be considered. Since security plays an important role in international contracts of sale, security mechanisms such as standby letters of credit and export credit insurance along with international instruments such as the proposed *Unidroit Convention on International Interests in Mobile Equipment* will be brought into the picture. Dispute settlement through international arbitration is a common feature of modern interjurisdictional contracting. Consequently, domestic and international arbitration legislation and procedures will be examined.

LAW 403.3

Advanced Secured Transactions 1/2(3L)

Prerequisite(s): LAW 302 and 303.

Students are given the opportunity to examine in depth *The Saskatchewan Personal Security Act* primarily as it functions in the context of business financing transactions. Special problems that arise in the context of the use of broadly-based security agreements and future advance financing are examined. The priority structure and registry system of the *Act* are studied in detail in the light of the types of issues that are generally encountered in business financing transactions. Post-default rights and remedies, including the appointment of receivers are examined. A portion of the course time is devoted to a brief examination of the secured financing system provided to chartered banks in the *Bank Act*. Approaches to the resolution of priority issues where the two systems overlap or conflict one with the other are considered.

**LAW 404.3
Debtor-Creditor Law
1/2(3L)**

Designed to familiarize students with the central aspects of the system through which money judgments are enforced. The various methods of judgment enforcement are examined including execution against goods, intangibles and interests in land; exemptions from execution; equitable execution; charging order and garnishment. In addition, features of the system that are incidental or peripheral to the enforcement of judgments are examined including distribution under *The Creditors Relief Act*, interlocutory injunctions, pre-judgment garnishment, fraudulent conveyance and fraudulent preference actions, enforcement of foreign judgments and proceedings under *The Bulk Sales Act*. The central features of the *Bankruptcy and Insolvency Act* are examined.

**LAW 405.3
Advanced Criminal Law
1/2(2S-1R)**

The focus of the seminar is on substantive criminal law with an emphasis on a critical analysis of criminal liability and criminal responsibility. Topics to be studied include acts, agency, choice, voluntariness, causation, consent, mens rea and fault, the use of objective and subjective tests in criminal law, and the empirical basis and ethical and political justifications for the defences of automatism, drunkenness, provocation, duress, necessity, and self-defence. The challenges that social and cultural diversity pose for the principled development of substantive criminal law will be considered throughout.

**LAW 406.3
Law and Culture
1/2(2S-1R)**

This interdisciplinary seminar explores legal culture within the larger cultural contexts that it shapes and is shaped by. In studying the ways in which law and cultures intersect in history, theory, and practice, students will enhance their critical understanding of the independence and interdependence of law and justice; the value of cultural theory in reading legal texts; the challenges and opportunities of inter-cultural perspectives; the role of media images of the law and lawyers; issues of race, gender, class, commodification, and sexuality; the construction of public and private spheres; censorship and intellectual property; agency and accountability; cultural myths and narrative powers.

**LAW 407.3
Bankruptcy, Insolvency and Receiverships
1/2(3L)**

Prerequisite(s): LAW 404.

Designed to give participants an opportunity to examine in greater scope and detail the system and basic concepts of bankruptcy and insolvency law and the equitable law of receiverships.

**LAW 410.3
Intellectual and Industrial Property I
1/2(3L)**

The general nature of intellectual and industrial property rights and the present

legal framework in Canada for the protection and exploitation of such rights. Traditional and emerging categories and their theoretical underpinnings. The substantive law of patents and copyright will be examined. An examination of the developments and problems caused by new technologies and the demands made on the law by a post-industrial, information society.

**LAW 412.3
Torts II
1/2(3L)**

Consideration of areas of tort liability not covered in LAW 212, and an examination of underlying theoretical concepts in tort law. Topics normally include: negligent misrepresentations; negligently caused economic loss; the relationship between tort and contract; constitutional torts and human rights claims in torts; the business torts and the tort of nuisance.

**LAW 415.3
Municipal Law
1/2(3L)**

An examination of the organization and operation of municipal corporations and land-use control. Consideration will be given to such matters as the scope and exercise of municipal powers, municipal planning and land-use regulation.

**LAW 417.3
Insurance Law
1/2(3L)**

An examination of general topics of insurance law and how the *Saskatchewan Insurance Act* effects those topics in relation to fire insurance, life insurance and automobile insurance. These topics include the legal position of agents in the business of insurance and the Insurance Law concepts of indemnity, insurable interest, non-disclosures and misrepresentations, warranties and conditions, proximate cause, valuation, subrogation and contribution.

**LAW 419.3
Remedies I
1/2(3L)**

Examination of judicial remedies in equity and at common law. In the first part the focus is on specific relief in the form of injunctions and specific performance. Particular attention is paid to the recent development of two new forms of interlocutory injunctive relief: Mareva injunctions and Anton Pillar orders. Selected topics in the assessment of damages comprise the balance of the course.

**LAW 421.3
Professional Responsibility
1/2(3L)**

A problem oriented course which is intended to train the student in the use of the Canadian Bar Association Code of Professional Responsibility in the practice of law. The student is taught the elements of the lawyer's duty to the client, duty to the court and duty to others through problems which involve concepts of duty, confidentiality, conflict of interest and integrity in settings where the lawyer functions as adviser, advocate and public servant.

**LAW 422.3
Legislation and Legislative Drafting
1/2(3S/L)**

Outlines the legislative process and essential terminology, and will include consideration of: the definition and organization of legislative information; the *Interpretation Acts*; the technical legal use of rules of grammar and language; a historical survey of interpretative theories; legislative intention; the operation of legislation; bilingual statutes; constitutional limitations on parliamentary supremacy; delegated legislation; and statutory interpretation and literacy criticism. The course will include drafting assignments as well as theoretical analysis.

**LAW 423.3
Criminal Procedure
1/2(3L)**

Jurisdiction, including classification of offences, time limitations, jurisdiction under the Charter; pre-trial procedure and practices, including search and seizure, arrest and detention, right to counsel; judicial interim release (bail); the preliminary inquiry and the process of discovery; the charging process, including stays and withdrawals; pleas; trials; trial by jury. *Note:* Students are advised to have taken LAW 351.

**LAW 424.3
Commercial Crime
1/2(3L)**

Examines in depth the law related to commercial crime, including a survey of corporate criminal liability, the application of the *Charter*, substantive offences under the *Criminal Code* and other statutes, search and seizure of documents under the *Income Tax Act*, problems with respect to sentencing and sanctions, proceeds of crime and aspects of professional responsibility and ethics relevant to all areas.

**LAW 425.3
Sentencing in the Criminal Justice System
1/2(3L)**

Selected topics relevant to sentencing in the criminal justice system combining theory, doctrine and practice. Theoretical aims of punishment and their translation into current legal doctrine and practice will be discussed, with particular emphasis on the Canadian and Saskatchewan context.

**LAW 426.3
Criminology, Retributive Justice and the Criminal Justice System
1/2(2S-1R)**

This is a seminar in applied administrative law. The criminal justice 'system' is examined as a regulatory mechanism. The use of discretion, reliance on predictive judgments, and the implications of the principles of natural justice and the *Charter* are considered. Topics are dealt with not in isolation but rather with reference to common systemic issues, questions of legal principle and process, and the perspectives offered by social theory and the social sciences generally. Guest speakers and visits to institutions are used where time permits and these are appropriate to the topics dealt with in the seminar.

Note: Students are advised to have taken LAW 340 and 425.

**LAW 427.3
Gale Moot
1/2(Oct.-Feb.)(3S)**

Participation in the Gale Moot Competition held annually in Toronto is required. It will involve research and advocacy, both oral and written, on a complex case or problem in the field of criminal and/or constitutional law. Students are responsible for the preparation of both an Appellant's and a Respondent's factum, and will participate in at least three practice moots at the College prior to the competition. Recommended for students with an interest in public speaking and exacting research.

**LAW 428.3
Wills
1/2(3L)**

Execution and revocation of wills, survivorship, intestate succession, probate, construction of wills, dependents' relief, the *Matrimonial Property Act* as it relates to estates.

**LAW 430.3
Alternate Dispute Resolution: Theory and Practice
1/2(2S-1R)**

Examination of the forms and functions of major disputing processes - negotiation, mediation, and adjudication. These are the processes which are critical to lawyers and other persons concerned with preventing or resolving disputes. Alternate methods of dispute resolution (ADR) will be studied from theoretical, critical and practical perspectives. Emphasis will be placed on the role of the lawyer in ADR processes.

**LAW 431.3
Advanced Constitutional Law
1/2(2S-1R)**

Examination of current issues in constitutional law.

**LAW 432.3
Human Rights
1/2(2S-1R)**

An understanding of contemporary debates about universalism and of the meaning of human rights in Canada with attention to political theory and international underpinnings. The concept of discrimination and the constitutional position of human rights and fundamental freedoms in Canada. Detailed analysis of the concept of equality as it is embedded in domestic anti-discrimination law and enshrined in section 15 of the *Charter*.

**LAW 433.3
Sallows Human Rights Seminar
1/2(2S-1R)**

The Sallows Seminar in Human Rights will be offered once a year, usually in the first term. It will be led by the visiting Sallows Professor in Human Rights and have a varied content, depending upon the incumbent's experience and interest. The seminar may be interdisciplinary.

**LAW 436.3
Indian and Aboriginal Law
1/2(3L)**

The Aboriginal peoples of Canada; Aboriginal peoples and the justice system, including Aboriginal justice systems; Aboriginal title and Aboriginal rights; treaties and the treaty-making process, including hunting and fishing rights,

Natural Resources Transfer Agreements; the Metis; land claims; federal and provincial jurisdiction over Aboriginal peoples and lands; Indian Act, including membership and Bill C-31; constitutional recognition and protection of the rights of Aboriginal peoples; Aboriginal self-government.

**LAW 437.3
Advanced Studies in Aboriginal Law
1/2(2S-1R)**

Prerequisite(s): LAW 436.

The seminar will involve an advanced discussion of current Aboriginal issues. Areas for discussion may include aspects of Aboriginal self-government, Aboriginal rights in international law, traditional Aboriginal law, Aboriginal title and sovereignty, treaties, Metis rights, hunting and fishing rights, reserve lands, federal and provincial jurisdiction.

**LAW 438.3
Wealth Distribution, Poverty and the Law
1/2(2S-1R)**

Examines the conditions and lives of those who are poor in Canada. Consideration of various definitions and theories of poverty and the relationship between poverty and race, gender and class inequality. Explores the role of law in regulating and/or alleviating poverty.

**LAW 439.3
Mediation
1/2(2S-1R)**

This seminar will explore the mediation process from both a theoretical and a practical, skill-based point of view. In addition to examining the stages of mediation and the role of the mediator, the seminar will deal with the use of mediation in different settings, such as family, labour, commercial and criminal law. Critical issues such as the impact of power imbalances, culture and gender will be discussed. Through the use of simulations, students will experience the mediation process as lawyers, clients and mediators. Students will also receive a clinical placement.

**LAW 440.3
Administrative Law II
1/2(2S-1R)**

Prerequisite(s): LAW 340.

In focusing attention on various aspects of the regulation of the discretionary powers of administrative bodies at all levels, this seminar is designed to complement the judicial review orientation of the basic Administrative Law course. Specific topics examined have included a comparative study of French droit administratif; the tension between judicial deference and *Charter* rights; the office of Ombudsman; agency studies (e.g. the Land Bank, the National Parole Board); discipline in professional sports; administrative discretion and the enforcement of environmental standards.

**LAW 441.3
Laskin Moot
1/2(Oct.-Mar.)(3S)**

This seminar is designed to provide academic supervision and credit for the five students who are members of the College team in the Laskin Memorial Moot Court

competition. The team consists of four oralists and one research counsel. Participants do research and written and oral advocacy on a complex problem in administrative and constitutional law. The seminar is recommended for those with an interest in advocacy, exacting research, and public law issues.

Note: Students are advised to have taken LAW 340.

**LAW 442.3
Mediation: Theory and Practice
1/2(2S-1R)**

Corequisite(s): LAW 443.3.

This seminar will explore the mediation process from both theoretical and practical points of view. In addition to examining the stages of mediation and the role of the mediator, the course will deal with the use of mediation in different settings. The skills and techniques used by mediators (and by lawyer advocates) will be examined, as well as how to determine whether mediation is appropriate. Through the use of simulations, students will experience the mediation process as lawyers, clients and mediators.

**LAW 443.3
Student Mediation Program
1/2 (2S-1R)**

Co-requisite(s): LAW 442.3.

This seminar will continue to develop the themes introduced in Mediation: Theory and Practice. Different applications of the process will be explored (family, business, labour, victim-offender). Critical issues such as neutrality and power, culture and gender, will be examined. The lawyer's role in the process will be considered in more depth. This seminar will contain a significant practical component: students will be assigned to various community programs, and may participate in the delivery of an on-campus mediation service.

**LAW 444.3
Environmental Law
1/2(3L)**

A course description surveying the actual and potential role of the law in protecting the integrity of the environment from threats posed by scientific and technological advances over exploitation of resources, rapid development and population growth.

**LAW 446.3
Natural Resources Law
1/2(2S-1R)**

This course will focus on the ownership, regulation and disposition of oil and gas, minerals and the forest resource in Saskatchewan and Canada. The course will include consideration of constitutional jurisdiction, ownership, and disposition of these resources.

Note: Students are advised to have taken LAW 444 or 445.

**LAW 447.3
Aboriginal Moot
1/2 (Oct. – Mar.) (3S)**

Prerequisite(s) or Corequisite(s): LAW 436.3.

The Aboriginal Rights Moot is a non-competitive moot structured on the traditional Aboriginal circle consensus-building process. It is designed to allow

Aboriginal law students to debate and discuss Aboriginal rights issues vital to the Aboriginal peoples.

**LAW 449.3
Canadian Legal History
1/2(3L/S)**

Introduces students to fundamental developments in Canadian legal history, and uses a historical perspective to enhance understanding of Canadian legal institutions and principles. The course will survey the ingredients of the Canadian legal heritage: English, European and American influences; the legacy of civil, common and customary law. There will also be discussion of the impact of Canadian historical events on specific areas of Canadian law, such as immigration law, family law, criminal and constitutional law.

**LAW 450.3
Western Canadian Moot
1/2(3L)**

The Western Canada Moot is a criminal trial moot. The students will prepare jury addresses, examination in chief, cross-examination, and arguments on the law and evidence, for use at trial. The students work with a fact situation, witness statements, and exhibits. Volunteer witnesses assist students in practicing examination in chief, and cross-examination and opening and closing jury addresses. In addition, the students will spend time analyzing the legal and evidential problems, reviewing the case law governing the problems, preparing memorandum on the issues, and delivering arguments to the presiding trial judge on these issues. Two team members will be selected to present the case at the Western Canada Moot competition. If the team is successful, they will attend the national competition for the Sopinka Cup in Ottawa, in March of each year.

**LAW 451.3
Evidence II
1/2(3L)**

Prerequisite(s): LAW 351.

An examination of the Law of Evidence from a critical perspective. First, an examination of the history, rationale and reform of evidence rules and statutes. Second, an examination of the Charter and Evidence law. Third, an examination of selected topics which bring an interdisciplinary, comparative or other relevant perspective to Evidence law.

**LAW 452.3
Trial Advocacy
1/2(3L)**

Prerequisite(s): LAW 351.

Advocacy techniques, practice and tactics in civil and criminal trial fora. Topics covered will include: the essentials of direct examination and cross examination, chambers advocacy, examinations for discovery, impeachment of witnesses, occurrence witness testimony, expert witnesses, the use of exhibits, family law, pre-trial conferences, closing arguments and addresses as well as sentencing.

**LAW 456.3
Conflict of Laws
1/2(3L)**

Conflict of Laws or Private International Law, as it is also widely known, deals with

the analysis and resolution of legal problems involving more than one jurisdiction. Using cases primarily from Tort, contract, property, and matrimonial law, the student learns how to characterize a legal issue, how to determine which jurisdiction is the most appropriate forum and which jurisdiction's law governs the issue, and how to evaluate the significance of factors that influence the recognition and enforcement of the foreign judgments.

**LAW 457.3
International Law
1/2(3L)**

An examination of the legal principles governing the conduct of states and other subjects of international law. Topics studied will include the creation and ascertainment of international law, application of international law in domestic and international tribunals, sovereign immunity, diplomatic relations, law of armed conflict, international protection of human rights and international environmental protection.

**LAW 459.3
Jessup Moot
1/2(Nov.-Feb.)(3S)**

This seminar is designed for students who wish to participate in the Canadian Regional Round of the Jessup International Law Moot Court Competition. The seminar will involve discussion of contemporary problems in public international law relevant to argument in the Jessup Moot, a survey of important cases decided by the World Court, and the preparation of a paper or brief that could serve as a basis for argument on the current moot topic assigned. A team of four or five students will be selected to represent the College at the forthcoming Moot. The seminar is recommended mainly for those with an aptitude for public speaking and exacting research.

**LAW 460.3
International Trade Law
1/2(3L)**

A study of the important law aspects of major international trade agreements. International economic integration arrangements, and international business transactions. The following topics will be examined: The World Trade Organization Agreement (WTOA), the North American Free Trade Agreement (NAFTA), Canadian trade law and some aspects of international private trade law.

Note: Students are encouraged to have completed International Law 457.

**LAW 461.3
Business Organizations II
1/2(3L)**

Prerequisite(s): LAW 361.

An examination of the different vehicles that may be employed as alternatives to the corporation for the purpose of carrying on a business. The structures examined include the sole proprietorship, master/servant relationship, agency relationship, partnership, joint venture, limited partnership, business trust, co-operative corporation and franchise. The characteristics of these structures and other factors which influence the choice of business vehicle are explored in detail.

**LAW 462.3
Co-operative Law
1/2(2S-1R)**

Prerequisite(s): LAW 361.

A study of the co-operative corporation as a business form and the theory of co-operative enterprise. The first part of the seminar will look at co-operatives from a legal perspective. Among other things, the following topics will be discussed: incorporation, members' rights, directors' duties and obligations, taxation of co-operatives compared with other business units, and consideration of special types of co-operatives such as Credit Unions. The second part of the seminar will attempt to view the co-operative in a broader, social perspective. Reliance will be placed on various resource people, if available, in discussing these broader aspects. The third part of the seminar will be devoted to papers presented by the student members of the seminar.

**LAW 463.3
Fiduciary Obligations
1/2(2S - 1R)**

This seminar is concerned with the law regulating the actions of fiduciaries. A fiduciary is a person who undertakes to act for the benefit to others. Society imposes on such persons a general obligation to refrain from taking a direct or indirect benefit for themselves. This obligation is comprised of a number of general and specific principles. Those principles, and the remedies available to the trusting party, are explored in detail.

**LAW 466.3
The Law of Trade in Agricultural Products
1/2(2S-1R)**

The study of the effect of regional and international trade agreements on North American agricultural policy, particularly with respect to market access, subsidization, and technical standards. Topics will include the effect of the North American Free Trade Agreement (NAFTA) and World Trade Organization (WTO), including tariffs and non-tariff barriers and granting of minimum access for agricultural products; permissible limits for domestic support and export competition subsidies; new rules concerning safety standards for the production and trade of agricultural products; and the compatibility of existing domestic agricultural and environmental policies.

Note: Although it would be advisable for students to have taken one or both of LAW 363 and 460, neither is a prerequisite to or corequisite of LAW 466.

**LAW 467.3
Labour Law
1/2(3L)**

A study of the legal concepts, institutions and procedures of labour law in Canada: the contract of employment at common law; legal protection of the right to organize; status under collective bargaining legislation; the concept of exclusive bargaining agent; the role of labour-relations tribunals; industrial dispute resolution mechanisms; and internal union affairs.

**LAW 468.3
Labour Relations
1/2(2S-1R)**

Prerequisite(s): LAW 467.

A seminar devoted to a consideration of the arbitration system and process. The first part of the seminar focuses upon case and doctrinal analysis. In addition, all students are required to participate in a mock arbitration hearing and write a paper dealing with an approved aspect of labour relations. A further requirement is that a summary of the paper must be presented to all members of the class.

**LAW 469.3
International and Comparative Labour Law
1/2(3L)**

Prerequisite(s): LAW 467.

A seminar which will examine the efforts which have been made to apply the concepts of international law to issues of trade union representation and collective bargaining. Examples of these efforts may be found in the conventions of the International Labour Organization and in the North American Agreement for Labour Co-operation, which was concluded as an agreement collateral to the North American Free Trade Agreement. In addition, there will be discussion of the comparative legal regimes governing collective bargaining which are in place in a number of industrialized countries.

**LAW 471.3
Family Law II
1/2(3L)**

Prerequisite(s): LAW 372.

Examines current debates on the definition and significance of the family including issues related to the legal rights of cohabitants, the legal status of gay and lesbian relations and the welfare implications of being defined as a member of a family unit. One or more of the following issues pertaining to the regulation of family life will also be explored: access to reproductive technology, child apprehension, the legal position of children of unmarried parents, and laws relating to spousal violence and child abuse. Finally, the course will cover the law on private agreements and the process of mediation and will also briefly examine the enforcement of Saskatchewan support orders.

**LAW 474.3
Children and the Law
1/2(2S-1R)**

Despite heightened interest in the welfare of children, reflected in a greater measure of state protection and legal remedies, the actual treatment of children by parents, by the law and by the state fluctuates widely. There is little consensus on standards of child rearing or state responsibility for children; nor is there a coherent theory of childhood which would shed light on the debate. Lack of consensus on what interests of children should ground legal duty, and the weight given to often-unarticulated doctrines of privacy and parental rights and autonomy, compromise the realization of the equality of children before and under the law. These issues will be explored from an interdisciplinary perspective through examination of the relationship of child, family and state;

theories of children's rights, including rights of the young offender; child abuse theory and construct; dilemmas in civil and criminal intervention, and alternate families.

**LAW 477.3
Taxation I
1/2(3L)**

Deals with federal income taxation which focuses on basic tax principles and underlying theoretical concepts. The taxation unit concentrated upon is the individual. Topics normally covered in the course include procedure, statutory interpretation, the tax base, measurement of income, deductions, exemptions, and capital gains.

**LAW 478.3
Taxation II
1/2(3L)**

Prerequisite(s): LAW 477.

Focuses upon taxation of entities other than the individual including corporations, trusts, and partnerships. Also examines tax aspects of transactions which lawyers often encounter in practice. Knowledge of the basic concepts covered in the introductory income taxation course is essential.

**LAW 479.3
Tax Planning
1/2(2S-1R)**

Prerequisite(s): LAW 477.

Consideration of areas of income tax law one most commonly comes across in practice of law. Topics normally include: tax avoidance and tax evasion, planning aspects of corporate tax law, planning aspects of Shareholder Agreements, tax planning for farmers, income tax implications of marriage and divorce, estate freezing and implications of corporate reorganizations as well as tax implications of tax sheltering techniques.

Note: Preference will be given to those who have previously taken LAW 478.

**LAW 486.3
Law and Psychiatry
1/2(2S-1R)**

Prerequisite(s): LAW 351.

Introduction to psychiatric theory; the methodology of psychiatric diagnosis and modern psychiatric treatment; the role of psychiatrists in the legal process. Psychiatry and the criminal process: remand for mental examination, fitness to stand trial, sentencing, automatism, insanity and dangerous offenders. The concept of competency: contractual and testamentary capacity. Civil commitment of the mentally ill: a comparative study. The psychiatrist as expert witness. Selected problems.

**LAW 490.3
Law Review
1/2(3S)**

This course publishes the *Saskatchewan Law Review*. The work involves selecting and editing material submitted for publication, participating in policy decisions, proofreading, and other miscellaneous tasks. Each student also undertakes written work for possible publication in the *Review*.

Note: A one-year commitment to the *Review* is required. Academic credit is, however, awarded only for one term. Students will

designate the term for which academic credit is awarded.

**LAW 495.3
Individual Directed Research
1/2(3S)**

This seminar allows interested students to undertake a substantial research project. Enrolment is limited to two students for each of the professors willing to take on student(s). The course is not timetabled as a convenient meeting time can be arranged to suit the instructors and students concerned. Students must approach individual professors with a research proposal. All proposals must be approved by the Studies Committee.

SPECIAL TOPICS

The following courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the college for more information.

- LAW 398.3 1/2(3L)
- LAW 399.6 1/2(3S)
- LAW 498.3 1/2(3L or 2S-1R))
- LAW 499.6 1&2(3S)

GRADUATE COURSES

College of Graduate Studies

**LAW 801.3
Native Rights I
1&2(3S)**

A range of areas relating to the legal status and rights of native people both in Canada and also in such other countries as the United States, New Zealand and Australia. Includes aboriginal land rights, treaty rights, hunting and fishing rights, the Indian Act, constitutional structures, human rights, affirmative action, the impact of the criminal law, taxation and commercial law.

Assessment will be based primarily upon a series of written assignments submitted by the student, approximately 6-8 tutorial papers.

**LAW 802.3
Native Rights II
1/2(3S)**

Covers specific topics in areas relating to the legal status and rights of native people not covered in LAW 801. Assessment will be based primarily upon written assignments submitted by the student, approximately 2-4 tutorial papers.

**LAW 810.3
Jurisprudence
1/2(3S)**

Current debates within the Western idea of law will be at the core of the literature canvassed in this seminar. The selected topics addressed will not be restricted to legal theory, but may extend to writers in the fields of political and moral philosophy.

**LAW 898.3/899.6
Special Topics
1/2(3S), 1&2(3S)**

Individualized research projects may be undertaken with the supervision of faculty members often in conjunction with courses offered in the College of Law. Topics are chosen in consultation with faculty advisors to complement areas of thesis research. Assessment will be based primarily upon a

series of written assignments prepared by the student over the term. Topics chosen may be selected from the following areas: Aboriginal Law, Commercial Law, Constitutional Law, Criminal Law or Human Rights, subject to faculty availability.

LAW 990 Seminar

Presentations regarding current research will be made by visiting faculty, faculty and graduate students. All graduate students in residence must make a presentation at least once each year. The seminar may also seek to provide for review of current literature and developments.

Note: All graduate students are required to attend, and to participate in the course to the satisfaction of the Law Graduate Studies Committee. This is a *non-credit* course.

LAW 994 Research

Completion of original research and writing of an LL.M. thesis.

LINGUISTICS

Department of Languages & Linguistics,
College of Arts & Science

LING 111.3 The Structure of Language 1/2(3L)

An introduction to the findings, theories and methods of modern structural linguistics. Includes phonetics, phonology, word-formation, syntax, semantics and pragmatics. Basic analytical skills are emphasized. Examples will be drawn from a wide variety of natural languages.

LING 112.3 The Dynamics of Language 1/2(3L)

An introduction to language acquisition, dialectology and historical linguistics. Includes how language varies geographically and socially, how it changes, borrowing, common descent and typological similarities among languages. The human biological propensity to acquire language and language universals are considered.

LING 232.3 Romance Linguistics I: Cultural History 1/2(3L)

Prerequisite(s): One of: ENG 289, 290; LATIN 112 and 113; LING 111, 112, 240; or any language course at the 120-level or higher.

The cultural history of the spread of Latin over Europe; the transformation of Latin creoles into the standard languages of modern states; and the social and literary influences which affected the evolution of Latin. Basic concepts of linguistic change and the comparative method will be illustrated.

LING 233.3 Romance Linguistics II: Historical Phonology and Morphology 1/2(3L)

Prerequisite(s): One of: ENG 289, 290; LATIN 112 and 113; LING 111, 112, 240; or any language course at the 120-level or higher.

The evolution of Latin into the Romance languages of French, Spanish, Italian, Portuguese and Romanian, and the study of phonological and morphological development of these languages.

LING 240.3 (Formerly ANTH 240) Principles of Phonology 1/2(3L-1P)

Prerequisite(s): LING 111 or 6 credit units in a language other than English.

Basic concepts of phonology and the procedures of phonological analysis are introduced, with an emphasis on generative phonology. Data from a variety of natural languages is analyzed.

LING 241.3 (Formerly ANTH 241) Introduction to Grammar 1/2(3L-1P)

Prerequisite(s): LING 111 or 6 credit units in a language other than English.

Advanced introduction to traditional, structural, and transformational models of grammar. Emphasizes recent trends in linguistic analysis and theory. Natural language data will be analyzed extensively.

LING 242.3 (Formerly ANTH 242) Phonetics 1/2(3L-1P)

Prerequisite(s): LING 111.

Introduces articulatory phonetics, the structure and functioning of the vocal tract, the major classes of speech sounds and systems of phonetic notation. A brief discussion of acoustic and perceptual phonetics will be given. Recognition, production and notation of speech sounds and the preliminaries of phonological analysis will be emphasized.

LING 243.3 (Formerly ANTH 243) Morphological Patterns in Language 1/2(3L)

Prerequisite(s): LING 111.

Investigates the internal structure of words and the rules by which words are formed. Material from a wide variety of languages is drawn upon to explore morphological processes, their relationship to syntactic structures, and to language typology. Practical work in morphological analysis is emphasized.

LING 244.3 Sociolinguistics 1/2(3L)

Prerequisite(s): LING 111.3 or 112.3 or SOC 110.6 or WGST 210.3.

This course presents language in its social context, covering aspects of linguistic variation within and across speech communities. Topics include language and class, gender, age, speech context and ethnicity. Language standardization, code-switching, bilingualism and diglossia, uses of conversation and appropriate address, and societal features of language change will be discussed.

LING 246.3 (Formerly ANTH 246) Language in Time and Space 1/2(3L)

Prerequisite(s): LING 111.

An introduction to the historical linguistics of unwritten and written languages. Topics will include genetic and topological relationship, comparative reconstruction, dialect formation, phonological,

morphological and semantic change, and writing systems. The integration of linguistics with prehistory and historical ethnology will be emphasized.

LING 342.3 (Formerly ANTH 342) American Indian Languages 1/2(3L)

Prerequisite(s): LING 111 and 112, or NATST 110.

Linguistic structures of native America, with special reference to the families of North America. Genetic relationship and areal typology will be included.

LING 478.3 Honours Project 1/2(IS)

Prerequisite(s): Permission of department and instructor.

A reading course on a specialized topic combining at least two of the components of the student's program: linguistics, languages and/or literature. This course will also provide an initiation into research methods leading to a term paper.

SPECIAL TOPICS

The following courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the college for more information.

LING 398.3 1/2(3L)
LING 399.6 1/2(3S)
LING 498.3 1/2(3L or 2S-1R))
LING 499.6 1&2(3S)

LITERATURE

Department of Languages and Linguistics,
College of Arts & Science

LIT 100.6 Masterpieces of European Literature in English Translation 1&2(3L)

A study of representative masterpieces of Greek, Latin, Spanish, French, German and Slavic literatures. Assigned reading, lectures, discussion, essay writing.

LIT 201.6 Comparative Studies in Germanic, Slavic and Hispanic Literature 1&2(3L)

Prerequisite(s): LIT 100 or another literature course.

Designed to give students an appreciation for both the common and contrasting elements in style, sensibility and manner of viewing the world of great Germanic, Slavic and Hispanic writers through the study of some of their important representative literary works.

LIT 261.3 Revolution and Dissidence: Studies in Protest Literature 1/2(3L)

Prerequisite(s): ENG 110 or LIT 100.

Selections from French, Germanic, Hispanic and Slavic literatures. All class lectures and readings in English. Authors studied may include Cervantes, Lope de Vega, Gogol, Dostoevsky, Anouilh, Sartre, Brecht, Kafka, and Sembene Ousmane. Students majoring in Comparative

Literature will have a one-hour tutorial each week to read and discuss in the original language the literary selections pertinent to their language specialization.

LIT 262.3 Exiles and Emigrés: Studies in Expatriation 1/2(3L)

Prerequisite(s): ENG 110 or LIT 100.

Selections from French, Germanic, Hispanic and Slavic Literatures. All class lectures and readings in English. Selections may include works of Voltaire, Conrad, Nabokov, Gogol, Shevchenko, Paul Celan, Thomas Mann, Brecht, Martí, Rubén Darío, Neruda, García Márquez. Students majoring in Comparative Literature will have a one-hour tutorial each week to read and discuss in the original language the literary selections pertinent to their language specialization.

LIT 263.3 Heroines, Anti-Heroines and Gender Definition in Literature 1/2(3L)

Prerequisite(s): ENG 110 or LIT 100.

Literary selections from French, Germanic, Hispanic and Slavic Literatures. All class lectures and readings in English. Selections may include Flaubert's Madame Bovary, Tolstoy's Anna Karenina, García Márquez's *Erendira*, Mérimée's *Carmen*, Christa Wolf's *Cassandra*, Kant's and Nietzsche's commentaries about women. Students majoring in Comparative Literature will have a one-hour tutorial each week to read and discuss in the original language the literary selections pertinent to their language specialization.

LIT 264.3 Mephisto and Faust: Knowledge, Power, Damnation and Redemption 1/2(3L)

Prerequisite(s): ENG 110 or LIT 100.

The development of the Faust and Mephisto figures from the Renaissance to the twentieth century in literature and other media such as opera, ballet, and film. French, Germanic, Hispanic and Slavic works will be included. All class lectures and readings will be in English. Students majoring in Comparative Literature will have a one-hour tutorial each week to read and discuss in the original language the literary selections pertinent to their language specialization.

LIT 300.6 Comparative Literature 1&2(3L)

Prerequisite(s): 18 credit units in literature. Intended for advanced students of literature. European and American novels, representing traditional types, are read in English, with attention to conventional structures and the theory of genre.

LIT 479.6 Honours Project 1&2(IS)

Prerequisite(s): 12 credit units of Comparative Literature courses and permission of the department.

A reading course on a specialized topic combining the literatures of the student's two languages. This course will also

COURSES • Literature

provide an initiation into research methods leading to an honours thesis.

SPECIAL TOPICS

The following courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the college for more information.

LIT 398.3 1/2(3S)
LIT 399.6 1/2(3S)
LIT 498.3 1/2(3S)
LIT 499.6 1&2(3S)

MARKETING

Department of Management and Marketing, College of Commerce

See also Marketing courses under Commerce in this section of the *Calendar*.

MKT 400.6 Honours Seminar in Marketing 1&2(3S)

Prerequisite(s): Admission to the B.COMM Honours program.

Directed readings and individual research in the area of Marketing. The major course requirement involves the preparation of an honours research paper under the supervision of one or more faculty (Honours Advisor(s)) in the particular area of specialization. The resulting honours paper is normally presented at a department seminar.

GRADUATE COURSES

MKT 898.3 Special Topics 1/2

MKT 994 Thesis

Students writing a Master's thesis must register for this course.

MATHEMATICS

Department of Mathematics and Statistics, College of Arts & Science

Some courses are restricted to students enrolled in a particular college. Restrictions are noted in prerequisites.

MATH 100.6 Mathematics for Education Students 1&2(3L)

Prerequisite(s): Mathematics A30 or B30 or C30 (or, under the old mathematics curriculum, Algebra 30). For students intending to enter the Elementary Program in the College of Education.

An introductory course designed for students planning to teach at the elementary school level. Topics include basic algebra review, mathematics of finance, number theory, linear algebra, linear programming, counting techniques, probability and statistics.

Note: This course may not be taken for credit towards a major in mathematics. Students who have credit for a university course in mathematics (at least 3 credit units) are not permitted to take MATH 100 for credit.

Students who have taken MATH 100, and subsequently take other junior mathematics courses, will be governed by the regulations of the Department of Mathematics.

MATH 101.3 Elementary Calculus 1/2(3L)

Prerequisite(s): Mathematics B30 (or Algebra 30).

An elementary introduction to calculus including functions, limits, derivatives, techniques of differentiation, curve sketching and maximum and minimum problems, antiderivatives and the integral.

Note: This course may not be taken for credit towards a major in mathematics or statistics.

Note: This course may not be used as a prerequisite for MATH 112 or 116. Students who have credit for MATH 102.6 may not take this course for credit.

Note: This course may not be used in Requirement 1 for Program Type C.

MATH 110.3 Calculus I 1/2(3L-1.5P)

Prerequisite(s): Mathematics B30 and Mathematics C30 (or, under the old mathematics curriculum, Algebra 30 and Geometry-Trigonometry 30).

Introduction to derivatives; limits; techniques of differentiation; maximum and minimum problems and other applications; implicit differentiation; anti-derivatives.

Note: Students wishing to complete a full year of calculus should register for either MATH 112 or 116 for Term 2. At the completion of MATH 110, students will be allowed the option of changing their choice of the Term 2 course. Students who have credit for MATH 112, 116, or 123 may not take this course for credit. Students who have credit for the former MATH 102 and subsequently take MATH 110 will lose credit for half of MATH 102. Students who have credit for MATH 101 and subsequently take MATH 110 will lose credit for MATH 101.

MATH 112.3 Rudiments of Integral Calculus 1/2(3L-1.5P)

Prerequisite(s): MATH 110.

Techniques of integration; the definite integral and simple differential equations - with applications and numerical techniques.

Note: MATH 112 is intended to be a terminal course in calculus and should be taken only by those students who are content to limit their mathematical options. Students who may require a more thorough grounding in calculus are advised to take MATH 116. Math 112 is not included among the courses meeting the major or Honours requirements of Mathematics and Statistics programs. Students who have credit for MATH 116 or 124 may not take this course for credit. Students with credit for MATH 123 may take this course for credit. Students who take MATH 112 and who subsequently require MATH 116 in their programs, must take MATH 116 but will not receive credit for it toward degree requirements in the College of Arts and Science. Students who have credit for the

former MATH 102 and subsequently take MATH 112 will lose credit for half of MATH 102.

MATH 115.3 Calculus for Pharmacy 1/2(3L-1.5P)

Prerequisite(s): MATH B30, MATH C30. Restricted to students enrolled in the College of Pharmacy & Nutrition.

Introduction to differential and integral calculus. Techniques of differentiation, curve sketching, and rate problems. Emphasis will be on topics that are most relevant to pharmaceutical applications of calculus.

MATH 116.3 Calculus II 1/2(3L-1.5P)

Prerequisite(s): MATH 110.

Techniques of integration; the definite integral and simple differential equations - with applications and numerical techniques. The theoretical foundations of limits, including the ϵ - δ formulation; continuity and differentiability; advanced curve sketching; inverse functions; inverse trigonometric functions.

Note: MATH 116 is intended to complete the basic introduction to calculus for students in the mathematical and physical sciences, and for others who require a solid introduction to calculus. MATH 116 is the specified prerequisite for most second-year courses in mathematics and statistics, including all courses accepted in major and Honours programs.

Note: Students who have credit for MATH 112 or 124 may not take this course for credit. Students with credit for MATH 123 may take this course for credit. Students who have credit for the former MATH 102 and subsequently take MATH 116 will lose credit for half of MATH 102.

MATH 124.3 Calculus II for Engineers 2(3L-1.5P)

Prerequisite(s): MATH 110. Restricted to students enrolled in the College of Engineering.

Differentiation and integration of inverse trigonometric functions, exponential, hyperbolic and logarithmic functions with applications. Techniques of integration; applications to work, pressure, moments and centroids. Polar co-ordinates and parametric equations of plane curves; complex numbers.

MATH 211.3 Numerical Analysis I 1/2(3L-1P)

Prerequisite(s): MATH 110 and 116.

An introductory course. Topics include: errors, solutions of linear and non-linear equations, interpolation, numerical integration, solutions of ordinary differential equations.

MATH 213.3 Linear Programming and Game Theory 2(3L)

Prerequisite(s): One of MATH 100, 101, (or 102), 110 or STATS 103.

Inequalities, Solutions of Linear Equations, Simplex Method, Transportation Problem, Duality, Game Theory and its

transformation into a linear programming problem. Applications will be emphasized.

Note: May not be included in the courses making up a major in mathematics or statistics. Students with credit for COMM 393 or CMPT 393 may not take this course for credit.

MATH 223.3 Intermediate Calculus 1(3L-1P)

Prerequisite(s): MATH 110 and 124. Restricted to students enrolled in the College of Engineering.

Vectors in two and three dimensions, vector calculus, space geometry, multiple integration and partial differentiation, line integrals and Green's Theorem.

MATH 224.3 Differential Equations 2(3L-1P)

Prerequisite(s): MATH 124. Restricted to students enrolled in the College of Engineering.

Differential equations of first and second order, sequences and series, convergence, Taylor's Series and elementary series.

MATH 225.3 Intermediate Calculus I 1(3L-1P)

Prerequisite(s): MATH 110 and 116.

Discusses analytic geometry, vectors, vector functions, partial differentiation, multiple integration, line integrals and Green's theorem.

Note: Students with credit for MATH 223 or 276 may not take this course for credit. Students obtaining a grade of 80% or better in this course may request permission from the Head of the Department of Mathematics and Statistics to register in courses for which MATH 276 is the stated prerequisite.

MATH 226.3 Intermediate Calculus II 2(3L-1P)

Prerequisite(s): MATH 110 and 116.

The topics to be discussed include infinite sequences and series, complex numbers, and first order and linear differential equations.

Note: Students are not permitted to take both MATH 226 and 238 for credit. Students obtaining a grade of 80% or better in this course may request permission from the Head of the Department of Mathematics and Statistics to register in courses for which MATH 238 is the stated prerequisite.

MATH 238.3 Introduction to Differential Equations and Series 1(3L-1.5P)

Prerequisite(s): MATH 110 and 116.

Solutions of first order and linear differential equations, infinite sequences and series, power series, Taylor's series, power series solutions of differential equations, and elements of mathematical modelling.

Note: Students intending to enter an Honours or Double Honours program are encouraged to take this course. Students are not permitted to take both MATH 238 and 226 for credit.

**MATH 258.3
Euclidean Geometry
1/2(3L-1P)**

Prerequisite(s): One of MATH 100, 101, (or 102), 110 or STATS 103.

A course in plane Euclidean geometry. Particularly recommended for teachers of mathematics.

Note: It is recommended that students have a basic introduction to high school geometry.

**MATH 264.3
Linear Algebra
1/2(3L)**

Prerequisite(s): One of MATH 100, 101, (or 102), 110 or STATS 103.

Vector spaces, matrices and determinants, linear transformations, sets of linear equations, convex sets and n-dimensional geometry, characteristic value problems and quadratic forms.

Note: Students are not permitted to take more than one of MATH 264, 266 or 358 for credit.

**MATH 266.3
Linear Algebra I
1/2(3L)**

Prerequisite(s): MATH 110 and 116.

A study of linear equations, matrices and operations involving matrices, determinants, vector spaces and their linear transformations, characteristic values and vectors, reduction of matrices to canonical forms, and applications.

Note: Designed to meet the needs of students majoring or honouring in mathematics, statistics, computer science or one of the natural sciences. Students are not permitted to take more than one of MATH 264, 266 or 358 for credit.

**MATH 276.3
Vector Calculus I
1(3L-1.5P)**

Prerequisite(s): MATH 110 and 116.

Vector analysis, differentiation and integration of functions of several variables, line integrals and surface integrals.

Note: Students intending to enter an Honours or Double Honours program are encouraged to take this course.

Note: Students are not permitted to take MATH 276 and 225 or 275 for credit.

**MATH 277.3
Vector Calculus II
1/2(3L-1.5P)**

Prerequisite(s): MATH 276 (or MATH 225 with a grade of 80% or better).

An extension of MATH 276 to include a fuller discussion of parametrized surfaces and surface integrals, derivative as a linear mapping, inverse and implicit function theorems, change of variable formula for multiple integrals, Stokes' theorem and generalizations, max.-min. problems with constraints and analysis of critical points.

**MATH 313.3
Numerical Analysis II
1(3L)**

Prerequisite(s): MATH 211, and either 266 or an equivalent course in linear algebra.

Numerical methods in linear algebra. Topics covered include approximation theory, least squares, direct methods for linear equations,

iterative methods in matrix algebra, eigenvalues, systems of non-linear equations.

**MATH 314.3
Numerical Analysis III
2(3L)**

Prerequisite(s): MATH 211 and 238.

Numerical differentiation and integration, initial-value problems for ordinary differential equations, boundary-value problems for ordinary differential equations, introduction to numerical solutions to partial-differential equations.

**MATH 327.3
Graph Theory
1(3L)**

Prerequisite(s): MATH 264 or 266, and either CMPT 260 or 6 credit units of 200-level mathematics.

Graph Theory and its contemporary applications including the nomenclature, special types of paths, matchings and coverings, and optimization problems soluble with graphs.

**MATH 328.3
Combinatorics and Enumeration
2(3L)**

Prerequisite(s): MATH 264 or 266, and either CMPT 260 or 6 credit units of second year mathematics.

The theory of Combinatorics and Enumeration and its contemporary applications, including generating functions and recurrence relations, and the Polya and Ramsey Theories. A wide variety of practical applications will be presented.

**MATH 338.6
Differential Equations II
1&2(3L)**

Prerequisite(s): MATH 238 or 226.

Use of Laplace transforms, theory of infinite series, solution of ordinary linear equations in series, Sturm-Liouville problems, Fourier series, Bessel and Legendre functions, the Fourier integral, the Laplace, diffusion, and wave equations, calculus of variations, matrices, quadratic forms, oscillations of conservative systems.

**MATH 350.6
Differential Geometry
1&2(3L)**

Prerequisite(s): MATH 276 or 225, and 277.

Curves in 3-space, Euclidean motions, surface theory, introduction to differentiable manifolds, Gaussian and mean curvature, imbedding conditions, geodesics, parallel transport, Gauss-Bonnet theorem.

**MATH 358.6
Projective Geometry and Linear Algebra
1&2(3L)**

Prerequisite(s): MATH 110 and 112 or 116.

Provides an introduction to the projective line and plane, determinants, vector spaces, linear equations, linear transformations, and eigenvalues.

Note: Particularly recommended for teachers of mathematics. May not be included in the courses making up an Honours program in mathematics or statistics.

Note: Students are not permitted to take more than one of MATH 264, 266 or 358. Students who have credit for a course or

half-course in linear algebra are not permitted to take this course for credit.

**MATH 360.6
Algebra I
1&2(3L)**

Prerequisite(s): MATH 264, 266 or 358.

Groups, rings, unique factorization domains, modules over principal ideal domains, vector spaces, linear transformations and canonical forms.

Note: Students may not obtain credit for both MATH 363 and 360.

**MATH 363.3
Abstract Algebra
2(3L)**

Prerequisite(s): One of MATH 100, 101, (or 102), 110 or STATS 103.

Introduction to algebraic structures, notably groups and rings. Topics include binary operations, groups, subgroups, homomorphisms, cosets, Lagrange's theorem, permutation groups, the general linear group; rings, polynomial rings, Euclidean rings.

Note: Recommended for teachers of mathematics. May not be included in the courses making up an Honours program in either Mathematics or Statistics.

Note: Students having credit for MATH 360 may not take this course for credit.

**MATH 364.3
Number Theory
1(3L)**

Prerequisite(s): One of MATH 100, 101, (or 102), 110 or STATS 103.

A course in elementary number theory with emphasis upon the interrelation of number theory and algebraic structures: review of unique factorization and congruences, the ring of integers modulo n and its units, Fermat's little theorem, Euler's function, Wilson's theorem, Chinese remainder theorem, finite fields, quadratic reciprocity, Gaussian integers, and the Fermat theorem on primes congruent to one modulo four.

Note: Recommended for teachers of mathematics. May not be included in the courses making up an Honours program in either Mathematics or Statistics.

**MATH 366.3
Linear Algebra II
1(3L)**

Prerequisite(s): MATH 266.

This is a follow-up course to MATH 266. Further important properties of linear transformations, such as spectral theorems and Jordan normal form, will be dealt with.

Note: Designed to meet the needs of Honours mathematics students, students majoring in mathematics, as well as students majoring in computer science or one of the natural sciences.

**MATH 371.3
Metric Spaces and Continuous Functions
1(3L)**

Prerequisite(s): MATH 238 and 276.

A rigorous construction of the real numbers followed by an introduction to general metric spaces and their basic properties. Continuous functions are studied in detail.

**MATH 373.3
Integration Theory
1/2(3L)**

Prerequisite(s): MATH 371.

Review of the Newton, Riemann and Riemann-Stieltjes integrals and their shortcomings, the generalized integrals including the Lebesgue integral, the main convergence theorems, Lebesgue measure, L_p -spaces and an introduction to Fourier analysis.

Note: Students with credit for MATH 470 may not take this course for credit.

**MATH 379.3
Complex Analysis
2(3L)**

Prerequisite(s): MATH 225 or 276, and 226 or 238.

Fundamental concepts, analytic functions, infinite series, integral theorems, calculus of residues, conformal mappings and applications.

**MATH 401.0
Seminar
1&2(1.5S)**

Students in Honours Mathematics or in Double Honours Programs in Mathematics and a second subject are required to participate in this seminar during their third and fourth years.

**MATH 431.3
Ordinary Differential Equations
1/2(3L)**

Prerequisite(s): MATH 277, 366 and 371.

Existence and uniqueness of solutions; time dependent and time independent linear systems; submanifolds of euclidean space, phase space, vector fields, flows; equilibria; linearization; stable, unstable and center manifolds; local bifurcations; planar flows; numerical methods.

**MATH 432.3
Dynamical Systems and Chaos
1/2(3L)**

Prerequisite(s): MATH 277, 266 and 379.

One dimensional dynamics; the quadratic family, symbolic dynamics and chaos. Period doubling; conservative systems, action angle variables, KAM theory; complex analytic dynamics, the Mandelbrot and Julia sets.

**MATH 433.3
Applied Group Theory
1/2(3L)**

Prerequisite(s): MATH 276 and 366 (or MATH 276 and 266 and permission of the instructor). MATH 277 is desirable.

Treats the following topics from group theory: permutation groups, crystallographic groups, kinematic groups, abstract groups, matrix Lie groups, group representations. Specific topics include the rotation group (spinors and quantum mechanical applications), the Lorentz group (representations and wave equations), $SU(3)$ (its Lie algebra and physical relevance).

**MATH 434.3
Applied Topology in Physics and Chemistry
1/2(3L)**

Prerequisite(s): MATH 276, or 225 with permission of the instructor. It is advisable to complete MATH 371 and 379 either

previously or concurrently.

Basic notions of topology, knot theory and graph theory are introduced and applied to the study of physical and chemical problems such as the classification of defects in an ordered medium as well as knotting and linking in models of DNA.

**MATH 438.3
Methods of Applied Mathematics
1(3L)**

Prerequisite(s): MATH 238, 276 and 277.
Calculus of variations, integral equations and applications.

**MATH 439.3
Partial Differential Equations
2(3L)**

Prerequisite(s): MATH 238, 276 and 277.
Classification of second order partial differential equations, some properties of elliptic, parabolic, and hyperbolic equations, applications.

**MATH 485.3
Elements of General Topology
1/2(3L)**

Prerequisite(s): MATH 371.
Topological spaces, separation axioms, products, quotients, convergence, connectedness, extension theorems, and metric spaces.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

- MATH 398.3 1/2(3S)
- MATH 399.6 1&2(3S)
- MATH 498.3 1/2(3S)
- MATH 499.6 1&2(3S)

GRADUATE COURSES

Department of Mathematics and Statistics,
College of Graduate Studies & Research

**MATH 814.6
Numerical Solution of Ordinary and
Partial Differential Equations
1&2(3L)**

*Prerequisite(s): MATH 314 and 338;
knowledge of a programming language.*
Ordinary Differential Equations: One-Step methods for initial-value problems, multi-step methods, boundary-value problems; discussion of discretization error and propagation of errors, convergence, and stability. Partial Differential Equations: Some finite-difference schemes for hyperbolic, parabolic and elliptic partial differential equations, their stability and convergence; applications.

**MATH 818.3/819.6
Special Topics in Applied
Mathematics
1/2(3L), 1&2(3L)**

Prerequisite(s): A graduate course in applied mathematics; or permission of the department.
The topics to be discussed will be related to recent developments in applied mathematics (numerical analysis, differential equations, mechanics, applied analysis, etc.) of interest to the instructor and students.

**MATH 830.6
Applied Functional Analysis
1/2(3L)**

Prerequisite(s): A course in linear algebra and an intermediate level calculus course.
Cauchy sequences, uniform convergence ($e - \delta$); Hilbert spaces; distributions and Sobolev spaces; boundary - value problems in (partial) differential equations; variational methods; weak solutions; Lax - Milgram lemma; finite element method.

**MATH 832.3
Mathematical Foundations of
Classical Mechanics
1/2(3S)**

Prerequisite(s): MATH 350; or permission of the department.
Symplectic geometry, canonical transformations, Poisson structures, Lagrangian systems, Legendre transformations, Hamiltonian systems, non-relativistic and relativistic mechanical systems.

**MATH 833.3
Mathematical Foundations of
Quantum Theory
1/2(3L)**

Prerequisite(s): MATH 373; or permission of the department.
Linear operators in Hilbert space, spectral theorem for self-adjoint operators, axioms of non-relativistic quantum mechanics, measurements, Schrödinger and Heisenberg pictures, commutation relations.

**MATH 834.3
Mathematical Foundations of
Relativity
1/2(3L)**

*Prerequisite(s): MATH 350 or
Corequisite(s): MATH 852; or permission of the instructor.*
Space-time as a differentiable manifold, Minkowski space equations of general relativity, cauchy problem, cosmological models.

**MATH 835.3
Non-linear Analysis
1/2(3L)**

Prerequisite(s): MATH 852; and a course in Functional Analysis or permission of the department.
Non-linear P.D.E. including: Einstein's equations, Yang-Mills equations, non-linear wave and Schrödinger equations, Korteweg-de Vries equation. Infinite dimensional Hamiltonian systems, classical field theories, conservation laws, symmetry groups. Inverse scattering method. Bäcklund transformations.

**MATH 837.6
Differential and Integral Equations
1&2(3L)**

Prerequisite(s): MATH 366 and 371.
Existence and uniqueness theory, self-adjoint and non-self-adjoint boundary-value problems, Poincaré-Bendixson theory, integral equations of the Fredholm Type, singular integral equations, solutions of differential equations in a Banach space.

**MATH 838.6
Theory of Partial Differential
Equations
1&2(3L)**

Prerequisite(s): MATH 439.
The Cauchy problem, Dirichlet and Neumann problems, existence and uniqueness.

**MATH 851.6
Differential Geometry
1/2(3L)**

Prerequisite(s): MATH 350; or permission of the department.
Differentiable manifolds (over \mathbb{R} & \mathbb{C}), tensor fields, differential forms, and Lie groups. Stoke's theorem, Poincaré and Dolbeault lemmas. Sheaf cohomology theory and the De Rham theorem. Vector bundles, connections and Chern classes, and Grassmannians. Dolbeault cohomology, Elliptic operator theory and the Hodge theorem. Poincaré and Serre duality.

**MATH 852.3
Differential and Riemannian
Geometry I
1/2(3L)**

Prerequisite(s): MATH 350.
Manifolds, tensor fields, integral curves and flows, Lie derivative, exterior calculus, Frobenius Theorem, vector and principal bundles, connections, curvature, Cartan equations, holonomy, Riemannian and pseudo-Riemannian geometry, equivalence problem.

**MATH 860.6
Algebraic Number Theory
1&2(3L)**

Valuations, p-adic numbers, quadratic forms, the Hasse-Minkowski theorem, modules, orders, Dirichlet's unit theorem, divisor theory for algebraic number fields.

**MATH 862.3
Algebra I
1/2(3L)**

Prerequisite(s): MATH 360.
Rings, modules, ideals, factorization, field theory, Galois theory.

**MATH 863.3
Algebra II
1/2(3L)**

Prerequisite(s): MATH 862.
Commutative algebra, multilinear algebra, non-commutative algebra.

**MATH 871.3
Abstract Analysis
1/2(3L)**

Prerequisite(s): MATH 373.
Basic Measure and Integration Theory. Regular Borel Measure. The Radon-Nikodym Theorem, Product Measure and Fubini's Theorem. Fourier Analysis on \mathbb{R}^n .

**MATH 872.3/873.6
Special Topics in Pure Mathematics
1/2(3L), 1&2(3L)**

The topics to be discussed will be related to recent developments in an area of pure mathematics (analysis, topology, algebra, etc.) of interest to the students and instructor.

**MATH 875.3
Functional Analysis
1/2(3L)**

Introduces functional analysis with an emphasis on Banach and Hilbert spaces. The

main results of Hahn-Banach, Krein-Milman and Banach-Steinhaus are developed and used to study concrete spaces, operators, the projection lattice and the ideal of compact operators on Hilbert space.

**MATH 876.3
Banach Algebras and Spectral
Theory
1/2(3L)**

Prerequisite(s): MATH 875; or equivalent.
The necessary theory of Banach Algebras and the functional calculus are developed for the spectral theorem for bounded self-adjoint operators on Hilbert space. Various applications and extensions presented.

**MATH 879.3
Complex Analysis
1/2(3L)**

Prerequisite(s): MATH 379.
After a review of basic properties of analytic functions the course will cover such topics as: Analytic Continuation, Riemann Mapping Theorem, Mittag-Leffler's Theorem, Runge's Theorem, Picard's Theorem, etc.

**MATH 881.6
General Topology
1&2(3L)**

Prerequisite(s): MATH 485.
Two-dimensional Manifolds, the Fundamental Group including the Seifert-Van Kampen Theorem, Covering Spaces, Applications to Knot Theory and Group Theory.

**MATH 883.3
Algebraic Topology II
1/2(3L)**

Prerequisite(s): MATH 882.
Simplicial and Singular Homology, The Lefschetz Fixed-Point Theorem, Cohomology, Duality in Manifolds.

**MATH 990
Seminar**

All graduate students in the department enroll each year. Students attend the regular department colloquia. After the first year in their program, they are expected to join the regular seminar series in their area of specialization.

**MATH 992.6
Project**

Students undertaking the project Master's degree (M.Math.) must register for this course.

**MATH 994
Research**

Students writing a Master's thesis must register for this course.

**MATH 996
Research**

Students writing a Ph.D. thesis must register for this course.

MECHANICAL ENGINEERING

Department of Mechanical Engineering,
College of Engineering

**M E 214.3
Introduction to Materials and Manufacturing
1(3L-1.5P)**

Provides an introduction to the relations between the structure and properties in engineering materials. It deals with the basics of structure, strengthening and deformation mechanisms of steels.

**M E 215.3
Fluid Mechanics I
2(3L-1.5P)**

Prerequisite(s): G E 125 and MATH 223 (taken).

The basic principles of fluid mechanics are introduced. Fluid statics is approached from a differential formulation and Fluid Dynamics using a control volume method. The principles are applied to pressure measurements, flow in pipes and flow over submerged surfaces.

**M E 227.3
Thermodynamics I
1(3L-1.5P)**

Prerequisite(s): CHEM 111 (beginning 2003 CHEM 114) and MATH 124 (taken).

The basic fundamental laws of thermodynamics involving compressible fluid flow, mass and energy transfers are developed. Problems are analyzed for closed and open systems using the concepts of heat and work and the basic laws. The course content is amplified by tutorials and laboratory experiments.

**M E 229.3
Introduction to Engineering Design
2(1.5L-3P)**

Prerequisite(s): G E 110; G E 125 (taken) and M E 214.

Introduces the mechanical engineering student to the concepts behind engineering design. Special seminars by practicing professionals supplement the course materials. Specific topics to be covered are: historical background, log books, scheduling, literature search, cost analysis, project management, CAD and CAM techniques, report writing, design ethics and legal responsibilities. Students are responsible for participating in and completing an applied design project.

**M E 251.3
Probability, Statistics and Analysis
2(3L-1.5P)**

Prerequisite(s): G E 120 and MATH 223 (taken).

Introduces some of the mathematical tools and engineering procedures to solve applied engineering problems. Topics include: linear algebra and applications to mechanical systems, vector calculus with applications to mechanical, fluids, and thermal systems, probability, statistics, and mean testing.

**M E 313.3
Mechanics of Materials I
1(3L)**

Prerequisite(s): G E 213; MATH 223 (taken), MATH 224 (taken) and M E 251 (taken).

General principles underlying the mechanics of materials are discussed and applied to the advanced strength analysis of common structural elements. Failure criteria and fracture mechanics are also considered.

**M E 316.3
Dynamics and Vibrations
1(3L)**

Prerequisite(s): G E 226, M E 251 (taken) and MATH 224 (taken).

Kinematics of rigid bodies and systems of rigid bodies using both stationary and moving coordinate systems. Three-dimensional kinetics. Introduction to vibration analysis. Introduction to Lagrangian dynamics. Discussion of design considerations, including numerical solution techniques, parameter estimation, and linkage synthesis. Cam-follower mechanisms.

**M E 318.3
Mechanical Engineering Laboratory I
1(6P)**

Prerequisite(s): M E 214 and 215. Corequisite(s): M E 313 and M E 327 or permission of the Department Head.

A general laboratory course demonstrating and further investigating engineering principles related primarily to material treated in the third year first term lectures. Considerable importance is placed on the development of student report writing capability.

**M E 321.3
Engineering Analysis I
1(3L)**

Prerequisite(s): M E 251 (or 371) and Math 224 (taken).

Partial differential equations of physical systems, concepts of wave propagation and heat transfer. Fourier series, Fourier and Laplace transforms, special functions. Solution techniques involving separation of variables and transform methods. Applications in mechanics, heat transfer, vibrations and electro-magnetism.

**M E 323.3
Mechanics of Materials II
2(3L)**

Prerequisite(s): M E 313.

The strength analysis of more complex structural elements is discussed. Also introduces the general principles of the mechanics of solids. Methods leading to computer aided analysis are emphasized.

**M E 324.3
Engineering Materials
1(3L)**

Prerequisite(s): M E 214.

Covers the iron-carbon diagram in detail. The processes taking place during heat treatment of steels are examined. Non-ferrous alloys, composites, and non-metallics are also covered. The subject of corrosion is introduced.

**M E 327.3
Heat Transfer
1(3L)**

Prerequisite(s): M E 215 and M E 227.

The basic concepts of the three major fields of heat transfer; conduction – basic laws and applications; convection – free and forced convection, internal and external flows, heat exchangers; radiation – laws of generation and exchange. Laboratory includes elementary heat exchanger design and computer simulation in the three modes of heat transfer.

**M E 328.3
Mechanical Engineering Laboratory II
2(6P)**

Prerequisite(s): M E 318.

Corequisite(s): M E 323 and 335; or permission of the Department Head.

A general laboratory course demonstrating and further investigating engineering principles related primarily to material treated in the third year, second-term lectures with emphasis on written reports.

**M E 330.3
Manufacturing Processes
2(3L)**

Prerequisite(s): G E 213 and M E 324.

Introduction to the processes in which physical objects are manufactured. Topics include casting, machining, powder metallurgy, special treatment of steels, joining, molding of plastics and superplastics forming of non-ferrous alloys.

**M E 335.3
Fluid Mechanics II
2(3L)**

Prerequisite(s): MATH 224 (taken), M E 215 and M E 251 (taken).

The basic principles of fluid mechanics are developed using a differential control volume formulation, and then applied to the study of incompressible flow. The distinction is made between ideal and viscous fluids, and laminar and turbulent flow. Both integral and differential methods are used to study boundary layers, with both industrial and environmental applications.

**M E 352.3
Engineering Analysis II
2(3L)**

Prerequisite(s): M E 321.

The Laplace Transform as a tool in the solving of differential equations is introduced. First and second order initial value differential equations are examined in context with engineering terms and applications. Transient and frequency responses are examined. Modeling of mechanical and electro-mechanical systems is introduced. Using the mathematical models combined with computer techniques, design of linear systems is considered

**M E 413.3
Machine Design I
1(3L)**

Prerequisite(s): M E 316, 323, 324; or permission of the Department Head.

Deals with various machine design fundamentals and the use of integrated design software. Design for fatigue and consideration of fracture mechanics is emphasized. Topics include: the selection of fasteners, rolling element bearings, V-belts and roller chains and the design of coil and leaf springs, spur gears, clutches and breaks.

**M E 417.3
Thermodynamics II
1(3L)**

Prerequisite(s): M E 227; M E 335 (taken).

A second course in equilibrium thermodynamics. It focuses on the second law and the concept of entropy, which are used to study the conditions of thermal, mechanical and chemical equilibrium, with applications to power cycles, refrigeration

cycles and reacting mixtures. The second law is next used to develop the concept of availability or energy. Finally, both the first and second laws are used to study one-dimensional compressible duct flow.

**M E 418.3
Mechanical Engineering Laboratory III
1(6P)**

Prerequisite(s): M E 328.

Corequisite(s): M E 417 and 431; or permission of the Department Head.

The laboratory exercises give the student responsibility for planning and setting up laboratory experiments and for the preparation of written reports. The use of standard measuring procedures in Mechanical Engineering is also emphasized. These laboratory exercises include control systems, fatigue and tribology, CNC manufacturing, engines and compressors, and vibrations.

**M E 431.3
Control Systems I
1(3L)**

Prerequisite(s): M E 352.

Transfer functions, transient and frequency responses, performance specifications, stability analyses, introduction to design (compensation).

**M E 450.3
Finite Element Analysis
1(3L-1.5P)**

Prerequisite(s): M E 321 (taken) and 323.

The finite element concept is introduced using simple structural elements. The method is then generalized using weighted residual methods. Numerous engineering problems drawn mainly from solid mechanics are solved using finite element methods. It is shown how the finite element method might be used for fluid flow and heat transfer analysis.

**M E 460.3
Automation and Robotics in Manufacturing
2(3L-1.5P)**

Prerequisite(s): M E 229 and 316 or permission of the Department Head.

An introduction to production automation and robotic modelling. Topics include: flow line production, automated assembly systems and line balancing, industrial robotics, kinematics, dynamics and trajectory control of robots.

**M E 463.3
Advanced Structural Analysis
2(3L-1.5P)**

Prerequisite(s): M E 450; or permission of the Department Head.

Governing equations for plates, membranes, shells and thin-walled beams. Applications to typical engineering problems. Elements of structural stability and dynamics. Some geometrically and materially nonlinear problems. Methods of numerical solutions, including the use of advanced FEM.

**M E 469.3
Computers in Mechanical Engineering
2(3L-1.5P)**

Prerequisite(s): M E 321 or permission of the Department Head.

Introduces students to several aspects of the practice of incorporating or embedding

computers in mechanical designs (Mechatronics). Included are the use of microcontrollers for data collection, sensing and control. The class emphasizes a hands on approach and communication within disparate design groups.

**M E 471.3
Introduction to Aerodynamics
2(3L-1.5P)**

Prerequisite(s): M E 215.

Corequisite(s): M E 335 or permission of the Department Head.

This course is an introduction to aerodynamics which explores the lift and drag performance of airfoils. Potential flow is used to develop the theory of flow over airfoils and wings, using both classical and numerical – e.g. vortex panel – methods. Boundary layer theory is used to explain the role of viscosity and the potential for flow separation. Numerical models are used to predict skin friction values. Finally, the development of shock waves for supersonic conditions is considered.

**M E 472.3
Advanced Control Systems
2(3L-1.5P)**

Prerequisite(s): M E 431 or permission of the Department Head.

Topics include: frequency response, design and compensation using root-locus and frequency response methods, state-space approach, nonlinear systems, Liapunov stability methods, digital control systems, as well as case studies.

**M E 473.3
Introduction to Computational Fluid
Dynamics
2(3L-1.5P)**

Prerequisite(s): M E 321 and 335.

Introduces the student to the subject of Computational Fluid Dynamics, as well as numerical methods for predicting heat transfer. The course focuses on incompressible flow of a viscous fluid, including both diffusive and convective transport. Pressure solvers and turbulence models are also described. A comprehensive commercial CFD package is introduced to the students, as an example of the software used by engineers to perform numerical simulation of heat and fluid flow.

**M E 475.3
Introduction to Mechatronics
2(3L-1.5P)**

Prerequisite(s): M E 431; or Department Head's permission.

The objective of the course is to provide engineers with the tools necessary for managing the design and development of Systems requiring a multi-disciplinary approach. It deals with life cycle models and disciplines required for integration of complex industrial systems. The course will review and links selected topics from mechanical, electrical, electronics, software and control engineering. Problems considered would involve real-time computer aided control of nonlinear and multivariable systems.

**M E 476.3
Multiphase Flow and Heat Transfer
1(3L-1.5P)**

Prerequisite(s): M E 327 and M E 335; or

Department Head's permission.

The fundamental concepts of the flow of multiphase mixtures, momentum and energy equations for two-phase flow systems, convective boiling and condensation heat-transfer processes, applications in oil-gas transport and thermal control systems (terrestrial and non-terrestrial).

**M E 477.3
Advanced Engineering Materials
2(3L-1.5P)**

Prerequisite(s): M E 324.

Corequisite(s): M E 330; or Department Head's permission.

Provides students with an exposure to advanced materials not covered in the core M E materials courses. Emphases will be placed on topics relating to materials used in high temperature and other hostile environments. Other topics will include fracture toughness and crack growth. Engineering applications of non-metallic materials are considered

**M E 478.3
Introduction to Fire Protection
Engineering
1(3L-1.5P)**

Corequisite(s): M E 327 or Department Head's permission.

This course covers the basics of fire science, including important theory from heat transfer, fluid mechanics, thermodynamics and other fields. Simple fire models are used to design fire protection systems for buildings, such as sprinklers, detectors and building construction features. Main fire test methods in use today and the analysis of fire test data are also discussed.

**M E 483.3
Heat Transfer for Electrical
Engineering
2(3L)**

Prerequisite(s): MATH 224.

Introduction to the basics of thermodynamics and fluid mechanics. The basic equations of conduction, convection and radiation heat transfer are considered. Applications are to steady and transient heat transfer problems with and without heat sources.

Note: Mechanical Engineering students cannot obtain credit for this course.

**M E 490.3
Design of Fluid Power Circuits
2(3L-1.5P)**

Prerequisite(s): M E 335 and M E 431 or Department Head's permission.

This course is an introduction to the design of industrial and Fluid Power circuits. The operation and design of basic components are considered. A methodology to the design of industrial circuits is introduced and applied to industrial applications. Design criteria for closed loop applications are introduced.

**M E 491.3
Thermal Systems Design
1(3L-1.5P)**

Prerequisite(s): M E 327 and M E 335 or Department Head's permission.

A design course involving the application of the fundamentals of thermodynamics.

Topics may vary depending on the choice of design project, but would typically include psychrometrics, internal and external energy gains, heating and cooling loads, duct and piping design, overall thermal design specifications and system component design and selection.

**M E 492.3
Materials in Engineering Design
2(3L-1.5P)**

Prerequisite(s): M E 324 and M E 330; or Department Head's permission.

Emphasizes materials engineering in the design process. It covers an overview of available engineering materials and their selection based on mechanical properties, surface durability and cost.

**M E 493.3
Machine Design II
2(3L-1.5P)**

Prerequisite(s): M E 413 or Department Head's permission.

This class is a continuation of Machine Design 1 with an emphasis on the use of integrated design software. Major topics will include the consideration of human factors, the use of optimization and probabilistic approaches in design. The application of modern design theories such as design for modularization, and design for maintenance and recycling will be presented. The final portion of the class will include case studies of actual designs.

**M E 495.6
Industrial Design Project
1&2(1L-3P)**

Prerequisite(s): M E 229 and 90 credit units of university study towards the B.E. degree in Mechanical Engineering; or Department Head's permission.

The synthesis and design of mechanical engineering components and systems. Students work in groups as a design team on selected projects submitted by industry. Oral and written presentations are made by students during the term with a formal oral presentation and final written report at the end of the course. Evaluations of oral and written presentations are made by supervisors as well as other outside examiners. Lecture material covers design processes and methodologies as well as design aspects related to occupational health and safety. This material is augmented through seminars given by industrial design specialists based on their design experiences.

**M E 498.3
Special Topics
1/2(3L-1.5P)**

These are courses offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the Dean's Office for further information.

GRADUATE COURSES

Department of Mechanical Engineering, College of Graduate Studies & Research

**M E 840.3
Theory of Inelastic Behaviour
1/2(3L)**

Foundation of plasticity theory. Plastic hardening. Applications involving plastic and elasto-plastic materials under various load/deformation conditions. Numerical techniques of solution.

**M E 841.3
Inelastic Behaviour of Materials
1/2(3L)**

Extremum principles and energy methods of solutions of elasticplastic deformation Theorems of limit analysis by energy methods. Applications in metal forming processes. Finite deformation theory. Applications of viscoelastic models and their associated constitutive equations.

**M E 845.3
Mechanics of Time-Dependent
Materials
1/2(2L-1P-.5S)**

Prerequisite(s): M E 323, 324 and 450.

Basic methods of structural analysis for creep and viscoelastic behaviours. Mathematical Models of transient and steady creep for metals at elevated temperatures. Stress relaxation. Creep rupture. Numerical Solution of creep problems. Linear and Nonlinear Viscoelastic Theories for Polymers and Synthetic Materials. Heredity. Modified Superposition Principles and Thermodynamics Viscoelastic Theories. Numerical Methods for Nonlinear Viscoelastic Materials.

**M E 854.3
Mechanical Vibrations
1/2(3L)**

Prerequisite(s): M E 321; or equivalent.

Topics covered include the study of the fundamental single-degree-of-freedom systems and the complex multiple-degree-of-freedom systems using Newton's law of motion, the energy method, Rayleigh's method, Lagrange's equations, the mechanical impedance method, influence coefficients, and matrix methods. Special topics include the study of transient vibration of continuous media. Solutions to the various differential equations encountered are presented.

**M E 855.3
Optimization in Structural Design
1/2(2L-1P-.5S)**

Prerequisite(s): M E 323 and 450.

Optimization theory and its applications to Structural Design. Basic concepts and terminology of the nonlinear constrained optimization problems. Numerical algorithms based on mathematical programming techniques and methods using optimality criteria. Structural optimization systems making use of the Finite Element Method Techniques are discussed and used to solve some practical problems.

**M E 856.3
Weighted Residual Methods in
Mechanical Engineering
1/2(3L)**

Prerequisite(s): M E 450.

Review of general weighted residual methods. Development of finite element, boundary element and mixed techniques, for approximate solutions of field problems of

interest to mechanical engineers. Time dependent and steady state solutions will be demonstrated with problems drawn from solid mechanics, fluid flow and heat transfer.

**M E 857.3
Topics in Finite Elasticity
1/2(3L)**

Prerequisite(s): C E 802; or permission of the instructor.

A review of tensor analysis, general theory of elasticity or finite deformations, constitutive equations, special problems with exact solutions, developments of plate and shell theories, solution by classical and weighted residual methods.

**M E 858.3
Mechanics of Thin-Walled Structures
1/2(2L-1P-.5S)**

Prerequisite(s): M E 323 and 450.

Warping, stability, imperfection sensitivity and other problems specific for thin-walled beams, plates, membranes and shells are discussed. The emphasis is on the physical interpretations of the governing equations (mostly nonlinear) and on the numerical solution methods. Behaviour of thin-walled pressure vessels, containers, pipes, element of aircrafts and space stations, etc., may be analyzed as the practicum.

**M E 860.3
Fluid Power Control
1/2(3L)**

Prerequisite(s): M E 441 and 335.

Advanced analysis of hydraulic and electrohydraulic systems including; transient behaviour of fluid circuits and transmission lines, control components and actuators; investigation and design of closed loop systems; application of Bond graphs.

**M E 861.3
Numerical Control
1/2(3L)**

Prerequisite(s): M E 441.

An introduction to feedback control systems operating on discrete rather than continuous data. Topics include: digital transducers, incremental and absolute modes of control, analog to digital conversion techniques, synthesis of combinational, sequential, comparator and interpolation circuits, transient response of digital systems, stability and compensation, introduction to sampled-data control systems.

**M E 862.3
Analysis and Synthesis of Linear Control Systems
1/2(3L)**

Prerequisite(s): M E 441.

Extension of linear feedback control principles emphasizing transfer functions and frequency response. Stability - Routh, Hurwitz, root locus, Nyquist. Bode plots. Compensation - series and minor loop equalization. Parameter plane analysis.

**M E 863.3
Advanced Topics in Linear Control Systems
1/2(3L)**

Prerequisite(s): M E 862.

State-space approach; concepts in linear continuous and discrete systems; controllability, observability, and minimal realizations. Multivariable systems.

Advanced methods of stability analysis. Introduction to optimal control systems.

**M E 864.3
Random Processes and Signal Processing
1/2(3L-3P)**

Prerequisite(s): M E 441.

Mathematical description of random process, Pseudo-random signals; response characteristics of physical systems; mathematical theory analyzing random data; analog and digital measurement techniques; analysis of non-stationary data; estimation theory, Kalman-Bucy filtering theory; special techniques and applications.

**M E 865.3
Nonlinear Systems
1/2(3L)**

Prerequisite(s): MATH 338; or equivalent.

Definition and classification of nonlinearities; analysis of non-linear systems emphasizing perturbation, piecewise linearization, phase-plane trajectories and first harmonic approximation; singularities; periodic solutions and limit cycles; stability; frequency response.

**M E 867.3
Applied Stochastic Optimization and Control
1/2(3L)**

Calculus of extreme and single stage decision process; variational calculus and continuous optimal control; discrete maximum principle; optimum control of disturbed parameter systems; optimum state estimation in stationary and nonstationary processes; dynamic sensitivity in optimum systems; computational methods in optimum systems control; invariant imbedding; state incremental dynamic programming.

**M E 869.3
Adaptive Control Systems
1/2(3L-3P)**

Prerequisite(s): M E 862 and 864.

Concept of adaptive control emphasizing dynamic response characteristics; types of adaptivity and the performance criterion in both linear and nonlinear control systems; dynamics of the parameter-perturbation processes, static and dynamic considerations; methods of process identification including correlation, series expansions, Laguerre and orthonormal functions; realization of adaptive control systems through the automatic adjustment of system parameters including an introduction to computer-controlled systems.

**M E 870.3
Solar Energy Conversion
1/2(3L)**

A senior engineering course in heat transfer. Presents methods of predicting solar radiation as well as sources of solar radiation data. Solar energy conversion device characteristics are analyzed; these include water ponds, solar collectors; solar cells, windows and other absorbers. Solar energy conversion systems are simulated.

**M E 871.3
Experimental Fluid Mechanics
1(3L)**

Prerequisite(s): ME 335 or equivalent.

The fundamentals of experiment planning including parametric design of experiments and experimental trajectories are introduced. Experimental techniques for pressure, temperature, and flowrate measurement are discussed. Particle Image Velocimetry, Laser Doppler Velocimetry, Phase Doppler Particle Analysis, and Hotwire Anemometry are treated in detail. Finally, the application of uncertainty analysis to experimental techniques in the thermal sciences is considered.

**M E 872.3
Fundamentals of Fluid Dynamics
1/2(3L)**

Development and study of the fundamental principles of fluid dynamics as applied to a continuum. Development of the constitutive equations of fluids. Analysis of incompressible inviscid and viscous flows including vortex motion, fluid jets, and flow over bodies. Student interests may determine some problem examples.

**M E 873.3
Advanced Topics in Fluid Dynamics
(3L)**

Represents a further study of viscous, incompressible flow (specifically turbulent flows). Hydrodynamic stability and the transition to turbulent flow are first considered, followed by a study of fully developed turbulence. Of specific interest is the development of turbulence models for prediction methods. Various topics in advanced theoretical fluid mechanics are also covered, especially the application of special analytical techniques.

**M E 874.3
Heat Transfer
1/2(3L)**

The three modes of heat transfer are treated in this advanced course; a) conduction - two and three dimensional heat conduction with time dependent boundary conditions and distributed heat sources; composite and anisotropic media; analytical and numerical methods; b) convection - differential and integral equations of the boundary layer, momentum and heat transfer in laminar and turbulent internal and external flows, forced and free convection; numerical methods; c) radiation - radiative exchange among various surfaces including; blackbody; gray-diffuse, real materials and specular; numerical methods.

**M E 875.3
Heating, Ventilating and Air Conditioning
1/2(3L)**

Advanced topics on: human comfort and health, indoor air quality, and psychrometry, air infiltration in buildings, cooling and heating loads for buildings; air distribution and heat recovery systems; simulation of building characteristics and systems under various weather conditions including heating and cooling equipment and natural daylighting; optimization of the thermal design and HVAC systems for buildings.

**M E 876.3
Multiphase Flow and Heat Transfer
1/2(3L)**

Prerequisite(s): M E 417.

The fundamental concepts of the flow of multiphase mixtures, momentum and energy equations for two-phase systems, convective boiling and condensation heat transfer processes, elementary thermodynamics of vapour/liquid systems.

**M E 877.3
Thermodynamics
1/2(3L)**

Prerequisite(s): M E 417; or equivalent.

The kinetic theory of gases is developed to illustrate the molecular description of classical quantities such as temperature, pressure and work. Transport properties such as viscosity, thermal conductivity and mass diffusivity are investigated using kinetic theory. Statistical approaches based on classical and quantum mechanics are used to describe the microscopic behaviour of substances. The microscopic interpretation of entropy is discussed. The link between microscopic behaviour and macroscopic thermodynamic properties is investigated.

**M E 878.3
Compressible Fluid Dynamics
1/2(3L)**

Acoustical waves; one-dimensional, isentropic flow and normal shocks are reviewed. Internal flows including the effects of area variation, friction and heat transfer are studied. External flows are then considered including oblique shocks and the method of characteristics.

**M E 879.3
Numerical Fluid Dynamics and Heat Transfer
1/2(3L)**

Prerequisite(s): M E 872.

An introduction to numerical methods for solving the transport equations for flow of a viscous, incompressible fluid, including convective heat transfer. A control volume based finite difference method will be adopted. Students will have the opportunity to develop their own working codes for specific two-dimensional problems.

**M E 880.3
Heat and Mass Transfer in Porous Media
1/2(3L)**

Prerequisite(s): Undergraduate courses in thermodynamics, heat transfer and fluid mechanics and at least one graduate course in heat transfer of fluid mechanics; or permission of the instructor.

The principles of heat and mass transfer in porous media for single or two-phase flows: conduction, convection and radiation, macroscopic and microscopic flow models, thermodynamics of capillary systems, transport from porous surface interface, local volume averaging methodology, simultaneous heat and mass transfer and flow with phase change (e.g. drying theory). Finite difference numerical models and boundary conditions are developed for the above phenomena and applied to typical physical problems.

COURSES • Mechanical Engineering

M E 881.3 **Selected Topics in Materials** **1/2(3L)**

Prerequisite(s): M E 474.

Topics include: crystallography; theory of dislocations; experimental techniques in metallurgy; theory of diffusion; macroscopic and microscopic aspects of fracture.

M E 885.3 **Neural Networks: Theory and Application** **1/2(3L)**

Prerequisite(s): A basic understanding of signals and dynamic systems.

Biological basis of neural networks; static and dynamic neural structures; multilayered feedforward neural networks; radial basis function networks; dynamic neural networks; fuzzy neural networks; and identification, control, vision, and pattern recognition using neural networks.

ME 886.3 **Advanced Engineering Design Methodology** **1(3L-9P)**

The selected effective design methodologies such as Axiom design, design for manufacturing, modular design and robust design and design for control are discussed. The emphasis is placed on the general idea of these methodologies. Computer implementations of these methodologies are discussed. Applications of these methodologies to some typical engineering problems are also discussed.

M E 898.3 **Special Topics** **1/2(3L/R/P)**

Consists of assigned reading, lectures by staff members, discussion periods and laboratory exercises with reports. Depending on the interests of the student and the supervisor, the topics are selected from one of the following research fields in Mechanical Engineering: air conditioning, applied mechanics, control systems, fluid dynamics, heat transfer, metals, or thermodynamics. It is intended for students in Ph.D. programs.

M E 990 **Seminar**

A seminar is held periodically throughout the regular session. The current research and literature is reviewed and discussed.

M E 992.6 **Project**

Students undertaking the project Master's degree (M.Eng.) must register in this course. It consists of independent study and investigation of a real world problem, and submission of an acceptable report on the investigation.

M E 994 **Research**

Students writing a Master's thesis must register for this course.

M E 996 **Research**

Students writing a Ph.D. thesis must register for this course.

MECHANIZED AGRICULTURE

Department of Agricultural and Bioresource Engineering, College of Engineering

MECAG 215.3 **Agricultural Machinery I** **1(3L-3P)**

A study is made of machinery for grain production with reference to machine function, use, selection and operation. Included are basic mathematics and physics essential for problem solving. Machines studied are those used for tillage, seeding, chemical application, haying and for grain harvesting, handling, drying and conditioning.

MECAG 309.3 **Water Management** **2(3L)**

Introduction to processes of water management with emphasis on the Prairie setting. Topics include: meteorology, hydrology, irrigation principles and practices, soil moisture, soil salinity, soil erosion, and snow management. Students actively participate in these discussions by preparing and presenting papers on selected topics. Designed for students who are not specializing in Mechanized Agriculture.

MECAG 417.3 **Agricultural Building Systems** **1(3L-3P)**

Building and farmstead planning for agricultural production, including systems analysis and materials handling. Functional requirements of space and environment are emphasized.

MECAG 421.3 **Principles of Food and Feed Processing Equipment** **2(3L-3P)**

Studies basic systems used in food processing including facilities, power requirements, equipment for primary and secondary processes. The specific unit operations and equipment studies include pumps and blowers, heat exchangers, drying, freezing, absorption, distillation, size reduction, and mixing. Discusses materials of construction for food process equipment and the layout of plant equipment.

SPECIAL TOPICS

These courses are offered occasionally in special situations. Students interested in such opportunities should contact the department for information on offerings.

MECAG 498.3

MEDICINE

Department of Medicine, College of Medicine

MED 505.12 **Internal Medicine/Neurosciences PD (12 weeks)**

A mandatory clinical rotation through various sections of the Department of Medicine designed to provide students with the opportunity to apply the knowledge and principles of General Internal Medicine in both hospital and outpatient settings.

Operating under the close supervision of residents and attending staff, students will be responsible for the evaluation, investigation, treatment and on-going care of patients.

MICROBIOLOGY AND IMMUNOLOGY

Department of Microbiology and Immunology, College of Medicine

For details on the B.Sc. in Microbiology see the College of Arts & Science section.

MICRO 204.2 **Immunology** **2 PA**

Prerequisite(s): Restricted to students enrolled in the College of Medicine and the College of Dentistry.

Outlines the basic principles of immunology and the application of these principles to the understanding of infection and immunity, mechanisms of immune injury, and autoimmune disease.

MICRO 214.3 **Basic and Medical Microbiology** **1(3L-3P)**

Prerequisite(s): BIOL 110; CHEM 112, 115. Students intending to major in Microbiology must take BIOCH 200 concurrently.

An introduction to the structure, physiology, and genetics of micro-organisms, with special consideration given to bacteria and viruses of medical importance and their role in human disease.

Note: Laboratories emphasize techniques used in the study of micro-organisms. Students with credit for AP MC 212 may not take this course for credit.

MICRO 216.3 **Introductory Prokaryotic Genetics and Physiology** **(3L/1P)**

Prerequisite(s): MICRO 214 or AP MC 212; BIOCH 200.

Introduces the metabolic and genetic properties of bacterial cells. Topics include bacterial growth and culture systems, key metabolic pathways and their regulation, nutrient transport systems, organization of genetic material, regulation of bacterial and viral gene expression and genetic exchange mechanisms. Students will appreciate the central role of bacteria in modern biotechnology. Laboratories illustrate concepts developed in the lectures.

MICRO 224.3 **Microbiology for Pharmacists** **2(3L-3P)**

Prerequisite(s): BIOL 110, CHEM 111. Restricted to students enrolled in the College of Pharmacy.

Introduces students to medically-important microorganisms including bacteria, viruses, fungi, and parasites. Topics include the structure and function of microorganisms, host-pathogen interactions, immunological principles, antimicrobial agents and resistance, infection control principles, and a representative survey of medically relevant microorganisms. Laboratory exercises

stress the observation, growth, and safe handling of microorganisms.

Note: Replaces MICRO 214 in the Pharmacy program (students who already have credit for MICRO 214 will not be required to take MICRO 224).

MICRO 303.6 **Microbiology and Infectious Diseases I** **1&2 PB**

Prerequisite(s): Restricted to students enrolled in the College of Medicine

Outlines the characteristics of microorganisms and emphasizes basic microbiologic principles. Incorporates both the etiologic approach to the teaching of medical microbiology and the systems approach to the teaching of infectious disease. Patient management problems stress the clinical approach to patients with infectious disease. Laboratory sessions emphasize the role of the laboratory in the diagnosis of infectious disease.

MICRO 305.6 **Human Oral Infectious Diseases** **1(7L/P/T)**

Prerequisite(s): Restricted to students enrolled in the College of Dentistry.

This course consists of didactic lectures, laboratory exercises, and clinical microbiology conferences, part of which are taken in conjunction with the College of Medicine. Deals with the general principles of medical bacteriology, mycology, virology, parasitology, and the organisms involved in systemic infections in general and oral infections in particular. Complications of systemic infections with oral manifestations or oral infections resulting from dental procedures are discussed. The role of the medical laboratory in the diagnosis of infectious diseases is also discussed together with consideration of antimicrobial therapy in relation to both systemic and oral infections.

MICRO 308.3 **Medical Bacteriology** **1(3L)**

Prerequisite(s): AP MC 212 or MICRO 214; BIOCH 200.

Considers the characteristics of bacterial agents of infectious disease in humans. Host-parasite interactions are emphasized with respect to pathogenesis and the innate immune response. The role of the laboratory in the control of infectious disease is discussed.

MICRO 309.3 **Medical Virology** **2(3L)**

Prerequisite(s): AP MC 212 or MICRO 214; BIOCH 200.

The principles of animal virology are covered, including classification, cell-virus relationships, basic techniques in virology, transmission of viruses, and study of viral disease.

MICRO 387.3 (Formerly 386) **Microbial Genetic Systems** **(3L/1T)**

Prerequisite(s): MICRO 214, 216; BIOL 211; BIOCH 200.

Bacterial and bacteriophage genetic systems will be dissected with a view to

understanding their genomes, gene regulation, replication, mutagenesis, repair, and recombination, and their practical use as tools for molecular genetics experimentation and biotechnology.

Note: Students with credit for MICRO 386 may not take MICRO 387 for credit.

MICRO 390.3 (Formerly 395) Laboratory Aspects of Microbiology I (3L/4P)

Prerequisite(s): MICRO 214, 216; BIOCH 200.

The principles and applications of techniques used in microbiology are covered with an emphasis on problem solving. Included are methods relating to safe handling, growth and identification of microbes and methods for studying virology and immunology.

Note: Intended primarily for Microbiology students. Others may be considered if space permits. For permission contact the Department of Microbiology and Immunology.

MICRO 391.3 (Formerly 395) Laboratory Aspects of Microbiology II (3L/4P)

Prerequisite(s): MICRO 214, 216; BIOCH 200.

The principles and applications of techniques used in microbiology are covered with an emphasis on problem solving. Included are methods for studying microbial physiology and genetics, and basic methods of microbial gene manipulation. Students with credit for MICRO 391 cannot receive credit for BIOCH 311.

Note: Intended primarily for Microbiology students. Others may be considered if space permits. For permission contact the Department of Microbiology and Immunology.

MICRO 403.3 Microbiology and Infectious Diseases II 1 PC

Prerequisite(s): Restricted to students enrolled in the College of Medicine.

MICRO 303 and 403 cover the management of human infectious diseases, including diagnosis and treatment, and the underlying microbiological principles, using a largely case based format, with many small group sessions. The topics are scheduled over the available 1.5 years to complement the Systems approach to medical teaching.

MICRO 416.3 (Formerly 215) Microbial Physiology 2(3L)

Prerequisite(s): MICRO 216; BIOCH 200 (Students majoring in microbiology must also take BIOCH 211 previously or concurrently).

Considers the structure and function of micro-organisms, the relationship between structure and function, mechanisms of cell division, composition of microbial cell walls and membranes, aerobic, fermentative, chemolithotrophic and photolithotrophic metabolism, and regulation of genes and metabolism.

Note: students with credit for MICRO 215 may not take MICRO 416 for credit.

MICRO 417.3 Molecular Virology 1(3L)

Prerequisite(s): BIOCH 200; MICRO 214 or AP MC 212.

Representative members of known animal virus families are used as models of biological events at a macromolecular level. Topics covered are virus purification and analysis methods, virus structure and self-assembly, virus genomes and genome expressions, virus proteins and their function, and virus-cell interactions during lytic, transforming, persistent and slow virus infections.

MICRO 421.3 Principles of Immunology 1(3L)

Prerequisite(s): BIOCH 200; MICRO 214 or AP MC 212.

Emphasizes the fundamental aspects of immunology dealing with the structure, genetics and function of antibody molecules, and the cellular and molecular regulation of immune responses. A portion is devoted to regulation of the immune response to tumours and particular parasites.

MICRO 423.3 Immunopathogenesis of Microbial Infections 2(3L)

Prerequisite(s): MICRO 421.

Explores microbial interactions with the host and its immune system. Various models of bacterial, viral and parasitic immunopathogenesis will be covered as well as intervention through vaccines or immune modulation.

MICRO 425.3 Molecular Basis of Microbial Pathogenesis 2(3L)

Prerequisite(s): MICRO 214, a course in genetics or molecular biology; or permission of the department.

Explores ways in which microbial pathogens interact with their hosts from a molecular and genetics perspective. Topics include: general pathogenic mechanisms of bacteria, viruses and parasites; bacterial virulence factors and their genetic regulation; molecular genetic approaches to studying pathogenesis; and various model systems which have been used to understand pathogenic mechanisms.

MICRO 490.0 Seminar 1&2(1S)

In their final year, students in the Honours Microbiology program are required to present one departmental seminar and to attend all departmental seminars.

MICRO 491.6 (Formerly 497) Research Project in Microbiology

Prerequisite(s): Minimum cumulative average of 70% in those courses counting toward the microbiology requirement of an Honours Degree in Microbiology. Permission of department is required.

A research project is selected in consultation with a faculty supervisor in whose laboratory the research will be carried out. Students will become familiar with the scientific literature and the laboratory techniques pertinent to the

project. Experimental work will be undertaken and data compiled and analyzed. To complete the research project, a written report will be tabled and a short oral presentation will be given to faculty and students.

Note: Intended primarily for those students majoring in microbiology who are considering a post-graduate degree in microbiology or another area of the life sciences.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

MICRO 398.3 1/2(3S)
MICRO 399.6 1&2(3S)
MICRO 498.3 1/2(3S)
MICRO 499.6 1&2(3S)

GRADUATE COURSES

Department of Microbiology and Immunology, College of Graduate Studies & Research

MICRO 716.3 Microbial Physiology 2(3L-1S)

Prerequisite(s): MICRO 216; BIOCH 200 or permission of the coordinator.

Molecular structures, functions and regulatory mechanisms relating to growth, membrane transport, metabolism, macromolecular synthesis and gene expression in microorganisms.

MICRO 717.3 Molecular Virology 1(3L)

Representative members of known animal virus families are used as models of biological events at a macromolecular level. Topics are virus purification and analysis methods, virus structure and self-assembly, viral genomes and genome expression, virus proteins and their function, and virus-cell interactions during lytic, transforming persistent and slow virus infections. For further graduate training in virology, see VT MC 833.

MICRO 721.3 Principles of Immunology 1(3L-1S)

Prerequisite(s): MICRO 214 or AP MC 212; BIOCH 200; permission of the instructor.

Emphasizes the fundamental aspects of immunology dealing with the structure, genetics and function of antibody molecules, and the cellular and molecular regulation of immune responses. A portion is devoted to regulation of the immune response to tumors and particular parasites.

MICRO 723.3 Immunopathogenesis of Microbial Infections 2(3L-3S)

Prerequisite(s): MICRO 421 or equivalent.

Explores model systems to gain an understanding of how microbial infections are contained by the host's innate and cognate defense systems and how the activation of the cellular and molecular

immune mechanisms contribute to pathology. Topics include: basic mechanisms of immune-cell migration and inflammation, functions of microbe induced cytokines, microbe initiated inflammatory responses such as toxic shock syndrome and granulomas, microbe initiated autoimmune and immunodeficiency diseases and control of microbial infections by immunomodulation and vaccination.

MICRO 787.3 Microbial Genetics 1(3L)

Prerequisite(s): MICRO 214, 216; BIOL 211; BIOCH 200 or equivalent.

Bacterial and bacteriophage genetic systems will be discussed with a view to understanding their genomes, gene regulation, replication, mutagenesis, repair, and recombination, and their practical use as tools for molecular genetics experimentation and biotechnology.

MICRO 814.3 Advanced Microbial Physiology 1(3S)

Prerequisite(s): MICRO 416.3 or MICRO 716.3 or permission of the course coordinator.

Consideration of advanced topics and current research relating to molecular structures, functions and regulatory mechanisms in the growth, membrane transport, metabolism, macromolecular synthesis, chemotaxis and gene expression of microorganisms.

MICRO 816.3 Genetic Analysis of Eukaryotic Microorganisms 1(3L)

Prerequisite(s): BIOL 211 and MICRO 387 or permission of the instructor.

Review various biochemical, genetic and molecular biological approaches in the study of model unicellular eukaryotic microorganisms, primarily *Saccharomyces* yeasts. Emphasis will be on genome organization and manipulation, DNA metabolism, control of gene expression and cell cycle regulation. The complete yeast genome sequence and its application will be discussed. Experimental strategies developed in these lower eukaryotes for the study of other organisms will also be discussed.

MICRO 827.3 Advanced Cellular and Molecular Immunology 2(3-4S)

Prerequisite(s): Permission of the department.

Assesses the current understanding of the immune system, and the experimental means by which this has been achieved, by analyzing papers from the current and past literature.

MICRO 850.3 Tumor Biology 2(3S)

Prerequisite(s): BIOCH 430 or 830 or permission of the department.

Discussion of current aspects of tumor biology including tumor metastasis, signal transduction, oncogenes and tumor suppressor genes, tumor immunology and tumor markers. Papers from the current

COURSES • Microbiology

scientific literature in these areas will be analyzed.

MICRO 898.3 Special Topics 1/2(2L/R)

Prerequisite(s): An introductory Microbiology course and permission of the department.

Study in selected areas of microbiology may be undertaken by senior students with permission of the department. The study will be arranged to suit the requirements of individual students. It may consist of lectures, essays, literature surveys and reports on assigned topics related to a specific subject. Laboratory work may be required.

MICRO 990 Seminar

Graduate students are required to present one seminar per year on their research during Term 1 or Term 2 in the Microbiology Graduate Seminar Series. The presentation will include a review of current literature and description of research progress by the student. Yearly registration, attendance and participation is required throughout the graduate program.

MICRO 994 Research

Students writing a Master's thesis must register for this course.

MICRO 996 Research

Students writing a Ph.D. thesis must register for this course.

MUSIC

Department of Music, College of Arts & Science

Alternating of Courses

Students should be advised that not all courses listed in the *Calendar* are offered in any given year. Some courses are given in alternate years. Careful planning in consultation with the Department of Music will eliminate any problems.

Music courses are listed by the following themes:

Advanced Music Research
Applied Ensemble
Applied Study
Core Music Courses
Electronic Music and Music Technology
Music History and Literature
Music Theory and Composition
Recitals
Performance and Pedagogy
Service Courses for Non-Music Majors
Special Topics

ADVANCED MUSIC RESEARCH

MUSIC 474.3 Selected Music Research Topics 1/2(3L)

Prerequisite(s): Students should have advanced standing in a Bachelor of Music (Arts and Science) program. See

Department Head for details.

A seminar devoted to particular areas of study in music which are not covered by curriculum offerings.

APPLIED ENSEMBLE (0 CREDIT UNITS)

MUSAP 120, 220, 320, 420

Band [(01) Concert Band, or (02) Wind Orchestra]

MUSAP 121, 221, 321, 421

Chorus [(01) Greystone Singers, (03) University Chorus]

MUSAP 122, 222, 322, 422

Corelli Strings

MUSAP 123, 223, 323, 423

Chamber Ensemble with Piano

MUSAP 124, 224, 324, 424

Percussion Ensemble

MUSAP 125, 225, 325, 425

String Ensemble

MUSAP 126, 226, 326, 426

Vocal Ensemble

MUSAP 127, 227, 327, 427

Small Wind Ensembles

MUSAP 128, 228, 328, 428

Collegium Musicum

MUSAP 130, 230, 330, 430

Music Theatre

MUSAP 131, 231, 331, 431

Contemporary Music Ensemble

MUSAP 132, 232, 332, 432

Jazz Ensemble

In all of these groups, the emphasis is on the study and performance of the most significant literature. Each of these activities is directed or guided by a faculty member.

Note: The activities are open to all students on campus. They are required courses for all students majoring in music.

***APPLIED STUDY**

Major (6 credit unit) Courses

MUSAP 140, 240, 340, 440 Piano

MUSAP 142, 242, 342, 442 Organ

MUSAP 144, 244, 344, 444 Harpsichord

MUSAP 148, 248, 348, 448 Voice

MUSAP 150, 250, 350, 450 Flute

MUSAP 152, 252, 352, 452 Oboe

MUSAP 154, 254, 354, 454 Clarinet

MUSAP 156, 256, 356, 456 Saxophone

MUSAP 158, 258, 358, 458 Bassoon

MUSAP 160, 260, 360, 460 Recorder

MUSAP 162, 262, 362, 462 French horn

MUSAP 164, 264, 364, 464 Trumpet

MUSAP 166, 266, 366, 466 Trombone

MUSAP 168, 268, 368, 468 Baritone horn

MUSAP 170, 270, 370, 470 Tuba

MUSAP 172, 272, 372, 472 Percussion

MUSAP 174, 274, 374, 474 Violin

MUSAP 176, 276, 376, 476 Viola

MUSAP 178, 278, 378, 478 Violoncello

MUSAP 180, 280, 380, 480 Double Bass

MUSAP 182, 282, 382, 482 Guitar

* In all of these Applied Study courses, the emphasis is upon solo, and ensemble literature, orchestral and choral studies (where applicable) the advancement of technique and the development of interpretation and comprehension. The student is required to cover a certain amount of material each year, appear in recitals and perform at juries. Only students in one of the B.Mus. programs may take these courses for credit.

CORE MUSIC COURSES

MUSIC 113.2 (Formerly 115) Materials of Music I: Acoustics, Modality and Early Tonality 1/2(3L)

Prerequisite(s): Permission of the department. Music majors must register concurrently in MUSIC 113, 114, 117 and 119.

An introduction to the acoustical foundations of music as a basis for the unfolding of theoretical concepts (modes, intervals, pitches, pitch classes, gamuts, scales, rhythm) relating to music up to 1700, focusing on two-part modal counterpoint. The course will develop aural, notational, and analytical tools in the above areas.

MUSIC 114.2 (Formerly 115) Materials of Music II: Theory and Analysis of Common Practice Repertories 1/2(3L)

Prerequisite(s): MUSIC 113.

The foundations and development of triadic harmony, inclusive of inversions, voice leading in strict four-part, open choral and keyboard scoring, figured bass practices. Implications of harmonic processes and harmonic rhythm on phrase structures and forms, simple modulations, issues of rhythmic and metric patterns, melodic augmentations and diminutions, chordal or non-chordal embellishments. The course will develop aural, notational and analytical tools in the above areas.

MUSIC 117.1 Keyboard Skills I 1&2(1P)

Prerequisite(s) or Corequisite(s): MUSIC 113 and 114.

Corresponds with materials studies in MUSIC 113; keyboard skills including scales, chords, harmonization of melodies, improvisation, clef reading, transposition and figured bass.

MUSIC 119.1 (Formerly 116 and 118) Aural/Vocal Skills I 1&2(1P)

Prerequisite(s) or Corequisite(s): MUSIC 113.

Corresponds with materials studies in MUSIC 113 and 114, aural cognition and vocal/notational reproduction through melodic, harmonic and rhythmic dictation of materials from music up to 1700 (first semester) and from the Common Practice period up to 1839 (second semester). Includes singing intervals, tonal melodies, chords, rhythms.

MUSIC 140.3 History of Music I: Western Music Prior to 1650 (Formerly 260) 1(3L)

History of western music from the earliest times to the period of the early Baroque, with an emphasis on the main forms, composers and representative compositions.

MUSIC 141.3 History of Music II: Western Music from 1650-1830 (Formerly 161) 2(3L)

Prerequisite(s): MUSIC 140.

History of western music covering the High Baroque, Classical and High Romantic eras with an emphasis on the main forms, composers and representative compositions. *Note:* Students with credit for MUSIC 161 may not take this course for credit.

MUSIC 213.2 (Formerly 215) Materials of Music III: Extended Harmony and Theory of Common Practice Repertories 1/2(3L)

Prerequisite(s): MUSIC 113 and 114; Music majors will normally register concurrently for MUSIC 213, 214, 217 and 219.

Advanced harmony including seventh chords and their inversions. Advanced figured bass practice. Analysis of harmonic phenomena in diverse textual environments including polyphonic or solo instrument settings. Chromatic harmony, extended chords and embellishments, tonicizations, intervallic projections, a comprehensive theory of modulation to all tonal regions. Expansion of phrase structures and formal procedures in 19th Century repertories. The course will develop aural, notational and analytical tools in the above areas.

MUSIC 214.2 (Formerly 215) Materials of Music IV: Theory and Analysis of 20th Century Repertories 1&2(3L)

Prerequisite(s): MUSIC 213.

Impressionism, expressionism: material, concepts. Traditional and newly-developed scales. The emancipation of dissonance, fusion tonality, atonal music, twelve-tone and serial techniques including rhythm and timbre. Analytic orchestration (Klangfarben).

Techniques of twelve-tone row rotation, partitioning and combinatoriality. Concepts of electro-acoustic music theory. Stochastic-, chance-based, aleatoric and time-structure techniques.

MUSIC 217.1
Keyboard Skills II
1&2(1P)

Prerequisite(s): MUSIC 117.
Corresponds with materials studies in MUSIC 213 and 214; keyboard skills including chords, figured bass, improvisation, transposition, score reading, lead-sheet notation and sight reading.

MUSIC 219.1 (Formerly 216 and 218)
Aural/Vocal Skills II
1&2(1P)

Prerequisite(s) or Corequisite(s): MUSIC 213.
Corresponds with materials studied in MUSIC 213 and 214; aural cognition and vocal/notational reproduction through melodic, harmonic and rhythmic dictation of materials from music of extended chromatic (19th Century) Common Practice repertoire (first semester) and from 20th Century repertoire (second semester).

MUSIC 240.3
History of Music III: Western Music
from 1830 to the Present
1(3L)

Prerequisite(s): MUSIC 141.
History of western music covering the High Romantic and Modern eras, with an emphasis on the main forms, composers and representative compositions, including Canadian music.

MUSIC 241.3
Introduction to Music Bibliography
(Formerly 372)
2(3L)

Prerequisite(s): MUSIC 240 or permission of the department.
An introduction to the materials and methods of music research, including an examination of historical and contemporary bibliographic resources, analyses and evaluation of reference materials in music education, music history and literature, performance, and music theory.
Note: Students with credit for MUSIC 354 may not take this course for credit.

ELECTRONIC MUSIC AND MUSIC
TECHNOLOGY

MUSIC 235.4
(See Music Theory and Composition)

MUSIC 335.3
(See Music History and Literature)

MUSIC 446.6
(See Performance and Pedagogy)

MUSIC HISTORY AND LITERATURE

MUSIC 285.3
Jazz History Survey
1/2(3L)

Prerequisite(s): Completion of 30 credit units in the College of Arts and Science or permission of the department.
An overview of the history and evolution of jazz music. The course will include the examination and discussion of the most historically significant musicians in jazz and

their music as well as the examination of the evolution of jazz music as an art form.

MUSIC 303.3
History of Church Music (Formerly
MUSIC 204)
1/2(3L)

Prerequisite(s): MUSIC 240 and 241 or permission of the department.
The significant developments in Judaeo-Christian religious music from its origins to the present day. The role of music in Jewish and particularly Western Christian traditions, both Roman Catholic and Protestant, will be examined.

MUSIC 311.3
The History of Opera (Formerly 310)
1/2(3L)

Prerequisite(s): MUSIC 240 and 241 or permission of the department.
A survey study of the history of opera from the Florentines to modern times.

MUSIC 312.3
Vocal Literature (Formerly 253)
1/2(3L-1P)

Prerequisite(s): Two years of applied voice training, MUSIC 141, 213, 214 and 241 or permission of the department.
Song literature of various western cultures will be studied toward acquiring a broad awareness of the vast repertoire of song.

MUSIC 335.3
History of Electronic Music
1/2(3L)

Prerequisite(s): MUSIC 213 and 214.
Explores the rich repertoire of works that have been created over a half century of electronic music. Gives an overview of the major movements, ideas and styles in electronic music as well as studying some important figures and key musical works in detail.

MUSIC 350.3
Wind Instrument Literature
1/2(3L)

Prerequisite(s): MUSIC 113, 114 and 240.
Examines the solo and ensemble literature for winds from the Middle Ages to the present era including the wind band repertoire.

MUSIC 354.3
A Survey of Keyboard Literature
(Formerly 353)
1/2(3L)

Prerequisite(s): MUSIC 213, 214, and 240.
A history of piano literature from the origins of the instrument to the 20th century, discussing styles, forms and interpretations of works taken from all periods.

MUSIC 358.3
Chamber Music
1/2(3L)

Prerequisite(s): MUSIC 113, 114, 240 and 241.
A survey of chamber music from 1750 to 1950 with particular emphasis on the development and stylistic analyses of the various forms.

MUSIC 361.3
Music in the Middle Ages
1/2(3L)

Prerequisite(s): MUSIC 240 and 241 or

permission of the department.
A history of music from the earliest times to the 14th century. Notation (monophonic and polyphonic), forms, composers, theoretical concepts and performance practices will provide the substance for the course.

MUSIC 362.3
Music in the Renaissance
1/2(3L)

Prerequisite(s): MUSIC 240 and 241 or permission of the department.
A history of music covering the 14th through the 16th centuries. The chief forms, composers and compositions will be studied. Stylistic analysis of selected compositions will be emphasized.

MUSIC 363.3
Music of the Baroque Period
1/2(3L)

Prerequisite(s): MUSIC 240 and 241 or permission of the department.
A history of music from approximately 1600 to 1725. Emphasis will be on the main forms, composers and representative compositions from this period.

MUSIC 364.3
Music of the Classical Period
1/2(3L)

Prerequisite(s): MUSIC 240 and 241 or permission of the department.
A history of music covering the Classical period from approximately 1700 to 1800. Emphasis will be on the main forms, composers and representative compositions from this period.

MUSIC 365.3
Music of the Romantic Period
1/2(3L)

Prerequisite(s): MUSIC 240 and 241 or permission of the department.
A history of music covering the Romantic period from approximately 1800 to 1900. Emphasis will be on the main forms, composers and representative compositions from this period.

MUSIC 367.3
The Music of the Twentieth Century
1/2(3L)

Prerequisite(s): MUSIC 240 and 241 or permission of the department.
Focuses on historically prevalent ideas and on analytic techniques necessary for a definitive understanding of the Twentieth-Century revolution of musical language.

MUSIC 368.3
Canadian Music
1/2(3L)

Prerequisite(s): MUSIC 240 and 241 or permission of the department.
An overview of the development of music in Canada including relationships to both European folk and art music and to Aboriginal music.

MUSIC 370.3
Performance Practices I: Middle
Ages, Renaissance, Baroque
1/2(3L)

Prerequisite(s): MUSIC 240 and 241 or permission of the department.
Studies the problems involved in the performance of medieval, renaissance, and

baroque music. Relates the study of music history to the stylistically correct interpretation of the music. Problems of solo performance and the interpretation of phrasing-notation from a performer's viewpoint will be discussed.
Note: Students who have credit for MUSIC 359 may not take this course for credit.

MUSIC 371.3
Performance Practices II: Classical,
Romantic, Twentieth Century
1/2(3L)

Prerequisite(s): MUSIC 240 and 241 or permission of the department.
A study of the problems involved in the performance of classical, romantic and 20th-century music. Relates the study of music history with the stylistically correct interpretation of the music. Problems of solo performance and the interpretation of phrasing-notation from a performer's viewpoint will be discussed.

Note: Students who have credit for MUSIC 359 may not take this course for credit.

MUSIC 450.3
Notation I Medieval to Renaissance
Music
2(3L)

Prerequisite(s): MUSIC 213, 214, 240 and 241 or permission of the department.
A study of the two general systems of music notation - white mensural and black - which preceded our modern system. Deals with lute and early keyboard tablatures. Includes discussions of problems and transcriptions into modern notation of ancient manuscripts.

MUSIC 457.3
See Theory and Composition.

MUSIC 464.3
Research Seminar in Musicology I
1/2(3L)

Prerequisite(s): MUSIC 240 and 241 or permission of the department.
A study of topics of current interest in musicology. Includes the oral presentation of research as well as the preparation of major research papers. The specific topic will be announced each time the course is offered.

MUSIC 465.3
Research Seminar in Musicology II
1/2(3L)

Prerequisite(s): MUSIC 464 and 241 or permission of the department.
Advanced research in musicology. The specific topic will be announced each time the course is offered.

MUSIC 472.3
Seminar in Music Bibliography and
Research Techniques
1/2(3L)

Prerequisite(s): MUSIC 240 and 241 or permission of the department.
A seminar designed to deepen the concepts and tools of scholarship developed in MUSIC 241. Emphasizes developing research skills through the preparations of lectures, lecture-recitals, and papers. Special bibliographical topics in the principal areas of music will be discussed.
Note: Students who have credit for MUSIC 354 may not take this course for credit.

MUSIC THEORY AND COMPOSITION

Composition

**MUSIC 202.6
Composition
1&2(3L)**

Prerequisite(s): MUSIC 213 and 214 which may be taken concurrently.
Composition in small forms for various media.

**MUSIC 302.6
Composition
1&2(3L)**

Prerequisite(s): MUSIC 202.
A continuation of work begun in MUSIC 202, including composition in larger forms for various media.

**MUSIC 402.6
Composition
1&2(3L)**

Prerequisite(s): MUSIC 302.
Advanced studies in composition and continuation of work begun in MUSIC 302.

Theory

**MUSIC 184.3
Jazz Materials**

Course includes development of jazz theory, ear training, transcribing and keyboard skills. This course is the prerequisite to Jazz Improvisation (MUSIC 283.3) and Jazz Arranging (MUSIC 386.3). This course is the suggested co-requisite for Jazz Ensemble Techniques (EDMUS 337.3) and Jazz Ensemble. MUSIC 184.3 is open to students of all colleges.

**MUSIC 235.3
Music Technology: Computer and
Music Software
1/2(3L)**

Prerequisite(s): MUSIC 113 and 114 or permission of the department.
Recommended for all musicians who are interested in using computer software and new technologies in their everyday work in music. Includes an introduction to computer, digital synthesizer and MIDI language and will explore some important software available on the market.

**MUSIC 307.3
Orchestration I
1(3L)**

Prerequisite(s): MUSIC 213 and 214.
A study of the art of orchestration and its practical application to strings, woodwinds and horn. The various styles of scoring, from Bach to the 20th Century, will be analyzed as well as discussion on the history of orchestration. Emphasis will be placed on arranging for full orchestra with particular attention to string, woodwind and horn sections.

Note: Students with credit for MUSIC 305 cannot take this course for credit.

**MUSIC 308.3
Orchestration II
2(3L)**

Prerequisite(s): MUSIC 307.
A study of the art of orchestration and its practical application to brass and percussion. The various styles of scoring, from Bach to the 20th century, will be analyzed as well as discussion on the history of orchestration. Emphasis will be placed on arranging for full orchestra with

particular attention to brass and percussion sections and transcribing for piano.

Note: Students with credit for MUSIC 305 cannot take this course for credit.

**MUSIC 346.3
Pre-Baroque Counterpoint
1(3L)**

Prerequisite(s): MUSIC 213 and 214.
Mainly a study of 16th-century contrapuntal techniques and forms. Though general stylistic features of the music are emphasized, differences in the styles of various composers are also studied. A brief study of pre-16th-century contrapuntal music is included.

**MUSIC 347.3
Baroque and 20th-Century
Counterpoint
2(3L)**

Prerequisite(s): MUSIC 213 and 214.
Essentially a study of 18th-century contrapuntal techniques and forms including canon, fugue, invention, and chorale prelude; 20th-century contrapuntal techniques; the use of canon and fugue in the 20th century is also introduced.

**MUSIC 386.3
Jazz Arranging**

(Prerequisite(s) MUSIC 184.3)
An introduction to the fundamental concepts of jazz arranging. Areas of study include small group (combo) writing and large ensemble orchestration techniques.

**MUSIC 447.3
Structural Musical Analysis
1/2(3L)**

Prerequisite(s): MUSIC 213 and 214.
Complete pieces of music or complete movements of compositions will be analyzed by integrating traditional analytical methods with reductive techniques and approaches based on the scientific analysis of sound and communications. The techniques are applied to music of all styles.

**MUSIC 457.3
Music Since 1950
1/2(3L)**

Prerequisite(s): MUSIC 213, 214, 240, and 241 or permission of the department.
A detailed study of important musical ideas and styles from 1950 to the present. Approached through the music and the theoretical writings of composers who have contributed important works during this time.
Note: Students with credit for MUSIC 456 may not take this course for credit.

PERFORMANCE AND PEDAGOGY

**MUSIC 283.3
Jazz Improvisation
1/2(3L)**

Prerequisite: MUSIC 113, 114 and an instrumental proficiency evaluation (to be administered by course instructor).
This course focuses on the study and development of musical skills as they pertain to the performance of jazz improvisation. Topics such as basic jazz-related theory; chord/scale relationships; motivic, chord based and modal improvisations are presented in a systematic manner. This course assumes

no pre-existing knowledge base of jazz improvisation but does presume a basic working knowledge and control over any given musical instrument. This course is open to all instrumentalists.

**MUSIC 313.3
Singing: From Science to Sound
(Formerly 356)
1/2(3L-1P)**

Prerequisite(s): Two years of applied voice training and MUSIC 213 and 214 or permission of the department.
A scientific and pedagogical study of the process of singing, with an emphasis on combining these facets of study toward a better understanding for use as artists and vocal instructors.

**MUSIC 325.3 (Formerly EDMUS 335)
Introduction to Conducting
1/2(3L)**

Prerequisite(s): MUSIC 213 and 214 or permission of the Department.
An introduction to the basic grammar of conducting choral and instrumental music.
Note: students cannot receive credit for EDMUS 335 and MUS 325.

**MUSIC 326.3 (Formerly EDMUS 336)
Intermediate Conducting
1/2(3L)**

Prerequisite(s): MUSIC 325 or the former EDMUS 335.
A continuation of the introductory course in conducting choral and instrumental music with emphasis on score analysis, study, interpretation and performance.
Note: students cannot receive credit for EDMUS 336 and MUS 326.

**MUSIC 359.3
Piano Pedagogy (Formerly 357)
1/2(3L)**

Prerequisite(s): MUSIC 213, 214, 240, 241 and two years of applied piano.
Examination of materials and methods from the first elementary principles to advanced levels. Stylistic and technical aspects of representative piano literature of all periods. Consideration of fundamental procedures in sight-reading, keyboard transposition, daily practice and interpretation.

MUSIC 370.3

See Music History and Literature.

MUSIC 371.3

See Music History and Literature.

**MUSIC 446.6
An Introduction to Electronic and
Computer Music
1&2(3L)**
Prerequisite(s): MUSIC 213 and 214.
An introduction to the use of the electronic sound synthesizer and the computer in musical composition and production including a consideration of aesthetic problems occurring in conjunction with these media.

RECITALS

MUSIC 129.0, 229.0, 329.0, 429.0
Non-credit courses required of all B.Mus. and B.Mus.(Mus.Ed.) students. To obtain a passing grade all students must follow the prescribed guidelines as specified in the

Department of Music's *Student Handbook*. Students should keep open 12:30-13:30 on Mondays, Wednesdays and Fridays, and 20:00-21:30 on Thursdays. Specific Sunday evenings are announced in September.

SERVICE COURSES FOR NON-MUSIC MAJORS

Non-Music Majors may also gain access by permission to other Music courses. Access to other music classes requires prerequisites as listed or the Department's permission.

**MUSIC 101.3 (Formerly 100)
Fundamentals of Music
1/2(3L)**

Introduction to the basic parameters of music including notation, rhythm, intervals, melody, scales, key signatures; aural and written comprehension of the above rudiments. This course could provide foundational material for the music theory sequence.

**MUSIC 103.3 (Formerly 100)
Structures of Music
1/2(3L)**

The study of the fundamentals of musical architecture and forms without requiring the knowledge of notation, to include folk, popular, rock, jazz and world music materials reflecting upon the highly developed forms of art music worldwide. Putting structural foundations of music into a broad perspective, this course will offer strategies for developing one's listening procedures and aural cognition.

**MUSIC 105.3
An Introduction to Western Art
Music
1/2(3L)**

The art of listening to music; analysis of structure and form; history of the great periods in music through its literature.
Note: This course involves a small cost in addition to tuition fees. Open to all students without prerequisite. Students majoring in music may not take this course for credit. Students with credit for MUSIC 109 may not take this course for credit.

MUSIC 285.3

See Music History and Literature.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

- MUSIC 298.3 1/2(3S)
- MUSIC 299.6 1&2(3S)
- MUSIC 398.3 1/2(3S)
- MUSIC 399.6 1&2(3S)
- MUSIC 498.3 1/2(3S)
- MUSIC 499.6 1&2(3S)

GRADUATE COURSES

Department of Music, College of Graduate Studies & Research

MUSIC 840.3
Seminar in Music Literature
1/2(3S)

A seminar in which students will conduct intensive studies of a clearly defined repertoire. This repertoire may be identified by any one of a number of criteria (medium, style, style-period, nationality, composer) provided that it is directly related to the student's specific area of graduate study.

MUSIC 841.3
Advanced Bibliography and Research Techniques
1/2(3S)

An in-depth examination of significant research materials in the principal area of applied music, music theory and musicology. Focuses on the effectiveness of research at the graduate level through the preparation of seminars, papers, and the proposing of the topic for the M.Mus. thesis.

MUSIC 842.6
Seminar in Composition
1&2(3S)

Composition in the smaller and larger forms. Works for vocal and instrumental ensemble, chorus, band, and orchestra will be included among the major projects. Composition for the theatre will also be considered as will composition utilizing the synthesizer and the computer.

MUSIC 843.3
Seminar in 20th-Century Music Materials
1/2(3S)

Examines current tendencies in orchestration and composition. It will examine the role of the synthesizer and the computer in musical analysis, in music printing, and in composition. Contemporary vocal and instrumental performance practices will also be considered.

MUSIC 844.6
Applied Performance Seminar
1&2(1S)

The intensive study of a wind, percussion, string, keyboard instrument or the voice will include advanced performance techniques, repertoire and recital preparation.

MUSIC 845.3
Seminar in Music Analysis
1/2(3S)

The student applies theoretical knowledge to the analysis of complete compositions. Structures and relationships revealed by the analysis will be applied to the particular area of specialization.

MUSIC 850.3
History of Theory
1/2(3S)

Examines a representative group of music theorists covering the period from antiquity to the present era.

MUSIC 851.3
Seminar in Music Theory
1/2(3S)

Emphasizes the basic tenets with special attention given to chromatic harmony, contrapuntal practices, analysis, and selected 19th- and 20th-century theoretical concepts.

MUSIC 852.3
Seminar in Performance Practices
1/2(3S)

A detailed discussion of selected problems and aspects of performance practices of a particular period or genre of music. Considers aspects of articulation, ornamentation, style, tempo, dynamics, organology, iconography, tuning and temperament and will also include the reading of selected treatises on performance practices.

MUSIC 853.3
Seminar in Musicology I
1/2(3S)

A research seminar on selected topics in musicology, chosen from the Middle Ages, Renaissance, or Baroque eras. May focus on the study of manuscripts, repertoires of monophonic and/or polyphonic music, the development of genres, the examination of style(s), the consideration of composers and significant monuments of music.

MUSIC 854.3
Seminar in Musicology II
1/2(3S)

A research seminar on selected topics in musicology, chosen from the Classical Period, Romantic Period or 20th century. May focus on the study of manuscripts, repertoires of polyphonic music, the development of genres, the examination of style(s), the consideration of composers and significant monuments of music.

MUSIC 855.3
Seminar in 20th-Century Music Theory
1/2(3S)

Encompasses the major theoretical thought of the 20th century, both that which deals with new approaches to the study of earlier music and that which presents new methods or systems of musical organization.

MUSIC 856.3
Approaches to the Study of Music Theory
1/2(3S)

Studies the way in which music theorists have approached the various traditional theoretical disciplines: tonal harmony, counterpoint, form, stylistic analysis and ear training. Focuses on the most recent approaches with a study of earlier theorists in order to establish historical context.

MUSIC 898.3/899.6
Special Topics**MUSIC 994**
Research

Students writing a Master's thesis must register for this course.

NATIVE STUDIES

Department of Native Studies, College of Arts & Science

Students may only receive credit for 6 credit units of 100-level Native Studies. Students who take NATST 110.6 subsequent to NATST 100.3, will only receive 3 credit units for NATST 110.

NATST 110 is a prerequisite to all other courses in Native Studies with the exceptions as noted in the course descriptions. Some upper-year courses require additional prerequisites. In special circumstances, prerequisites may be waived. Please see the instructor of the course to secure a waiver. NATST 110 is required for all degrees in Native Studies.

NATST 100.3
Foundations of Native Studies
1/2(2L-1S)

This course is designed to meet the College of Education entrance requirement of three credit units in Native Studies.

An introduction to both historical and contemporary issues in Native Studies, a unique and interdisciplinary field. The emphasis will be on the history of Aboriginal peoples, colonization and the Canadian state to contextualize current issues.

Note: This is a terminal course – it cannot be utilized toward a Native Studies degree or used as a prerequisite for any Native Studies courses. Students interested in pursuing a major or minor in Native Studies are advised to take NATST 110.6.

NATST 110.6
Introduction to Native Studies
1&2(2L-1S)

Introduction to the Native Studies field and a basis for more advanced study. Although not confined to the Canadian context, the course will emphasize Canadian content, ranging from the traditional to the contemporary development of Indian, Metis and Inuit societies.

NATST 200.6
History of the Metis People of Canada
1&2(2L-1S)

Prerequisite(s): NATST 110.

Through lectures and seminar readings, the origin and development of the Metis is analyzed. Emphasizes the historical significance of the Metis in the development of Western Canada. Discusses contemporary issues of the Metis.

NATST 203.3
History of the Indian in Western Canada
1/2(2L-1S)

Prerequisite(s): NATST 110.

Traces the evolution of Western Canadian Indians from earliest contact to the present era. Includes the peoples of the Pacific Coast, the Cordillera, the Western Subarctic and the Plains.

NATST 204.3
History of the Indian in Eastern Canada
1/2(2L-1S)

Prerequisite(s): NATST 110.

Using a lecture-seminar format, the course will examine the evolution of the Algonquin and Iroquoian peoples of the Eastern Woodlands prior to the Confederation era.

NATST 205.3
The Health of Native People
1/2(3L)

Prerequisite(s): NATST 110.

Introduces the student to the health problems of Native people in Canada. Examines the evidence for health and illness in pre-contact populations, traces the decline in health status following contact with the Europeans, and examines the contemporary health status of Native people.

NATST 206.3
Native People and Health Care
1/2(3L)

Prerequisite(s): NATST 110.

Introduces the student to the issues of Native health care in Canada. Topics include traditional medical systems and practices, the development of health services for Native people, the role of Native people in health care, and a critical evaluation of the Native health care system.

NATST 207.6
Native Peoples and the Canadian Political Process
1&2(3L)

Prerequisite(s): NATST 110.

An analysis of contemporary Canadian political and administrative processes as they affect Native Peoples. Emphasis will be placed on the Federal system of government and its effects on Native identity, community programs and local autonomy.

NATST 208.6
Images of the North American Indian
1&2(3S)

Prerequisite(s): NATST 110.

Examines how the various historical and contemporary images or representations emerged and changed over time and the cultural world views, ideas and values behind the images. Further discussion will centre around how these images affect our relationships with each other. After critical analysis of images, strategies for changing images will be explored. This will be done through interactive lectures, presentations, group and individual activities, critical viewing and analysis of photographs, films, videos, magazines, newspapers, and other popular media forms.

NATST 209.3
Introduction to Native Studies Research Methods
1/2(3L)

Prerequisite(s): NATST 110.

An introduction to basic research concepts applicable to Native Studies as a unique area of interdisciplinary study. The main emphasis will be on secondary research: framing research problems, library strategies, organizing information, writing literature reviews and expositions.

NATST 211.6
Native Literature
1&2(3L)

Prerequisite(s): NATST 110.

A survey of Native literature discussing the folklore, biography, drama, poetry and novels written about, and by Native Peoples. Emphasis will be placed on a multifaceted approach (aesthetic, linguistic,

psychological, historical and cultural) in examining Native Literature.

**NATST 213.3
The American (U.S.) Indian
1/2(3L)**

Prerequisite(s): NATST 110.
A history of American Indians from the contact period to the development of government policies. The Bureau of Indian Affairs and the American treaties, the removal of the Eastern tribes to the middle west, the termination policy, and contemporary issues will be discussed.

**NATST 219.3
Native People and Justice in Canada
1/2(3L)**

Prerequisite(s): NATST 110.
Examines the causes and consequences of crime involving Native Peoples. Topics include dimensions of Native arrests, law enforcement, the judicial process and the corrections system.

**NATST 225.3
Native Women in Canada
1/2(3L)**

Prerequisite(s): NATST 110.
Examination of the position of women in traditional, pre-contact Native society, the changes to that position wrought by contact with Europeans, and contemporary issues of concern to Native women.

**NATST 301.6
Reading Seminar in Metis History
1&2(3S)**

Prerequisite(s): 12 credit units in Native Studies.
A reading seminar in Metis History with emphasis on the historiography of the Metis and how capitalism, imperialism, colonialism, neo-colonialism and the state have affected the Metis.

**NATST 302.6
Seminar on Indian History
1&2(3S)**

Prerequisite(s): 12 credit units in Native Studies.
Through seminar presentations and readings, examines major developments and themes in Canadian Indian history.

**NATST 304.6
Native People and Development
Issues
1&2(2L-1S)**

Prerequisite(s): 12 credit units in Native Studies.
Surveys the historic, political and economic causes of Native underdevelopment in Canada. Government-sponsored economic development projects will be examined, and the special issues of northern energy development and renewable resources will be discussed. New strategies for Native economic development will be explored.

**NATST 305.6
World Indigenous Peoples: Historical
and Contemporary Issues
1&2(3S)**

Prerequisite(s): 12 credit units in Native Studies.
Issues of concern to selected indigenous peoples of the Fourth World. Analogies to the Canadian Native context will be made.

**NATST 309.6
Native Studies Research Methods
1&2(3L)**

Prerequisite(s): NATST 209.
Designed to enhance an understanding of research concepts and skills in the Native Studies field. Emphasizes interdisciplinary research approaches, primary source materials, research evaluation and the application of research to the needs of the Native community.

**NATST 310.3
Native People and the Fur Trade
1/2(1L-2S)**

Prerequisite(s): 12 credit units in Native Studies.
Perspectives on the economic, cultural and geographical aspects of the Native fur trade, emphasizing the subarctic fur trade.

**NATST 312.3
Resource Geography and Native
People
1/2(1L-2S)**

Prerequisite(s): NATST 110.
The application of knowledge of resource geography to traditional Native economic activities, especially hunting, fishing and trapping. Conservation problems, which developed with the spread of the commercial economy will be analyzed by examining Aboriginal and European approaches to resource management.

**NATST 314.3
Justice in Aboriginal Communities
1/2(3S)**

Prerequisite(s): NATST 219.
An advanced course on justice reform, focusing on community development and implementation of reform proposals. Students will develop an advanced knowledge of justice reform studies and proposals, and will be expected to complete primary research through attendance and reporting at a sentencing circle, court proceeding or by witnessing and reporting on another function of the justice system.

HONOURS COURSES

**NATST 400.6
The Churches and Native Peoples in
Western Canada, 1818-1870
1&2(3S)**

Prerequisite(s): 18 credit units in Native Studies.
A research seminar course on Church-Native relations in Western Canada.

**NATST 401.3
Native People and Northern
Development
1/2(3S)**

Prerequisite(s): 18 credit units in Native Studies.
A research seminar dealing with Native political reactions to northern development, the socio-cultural and economic impacts of large-scale development projects, land claims and renewable resources, and other development issues as they affect Native Peoples.

**NATST 402.6
Honours Research Paper
1&2(3R)**

Prerequisite(s): NATST 309 and permission

of the department.
The student will develop a research prospectus, undertake the research, and present a final report under the direction of a faculty advisor. Topics are open, subject to the availability of a faculty advisor.
Note: Students planning to register in this course must submit a proposal before August 15th.

**NATST 403.3
Theoretical Perspectives in Native
Studies
1/2(3S)**

Prerequisite(s): 18 credit units in Native Studies.
A research seminar which examines the development of dependency theory in the context of Latin America, and the utility of this concept for understanding the Native American and Native Canadian contexts. Topics include: the "development" of underdevelopment; colonialism; internal colonialism; imperialism; class analysis; and the metropolis-hinterland paradigm.

**NATST 404.6
Research Seminar on the History of
the Indians of Saskatchewan
1&2(3S)**

Prerequisite(s): NATST 309 and 12 credit units in Native Studies.
Consists of primary research (based on both written and oral sources) on selected topics on the history of Saskatchewan Indian Peoples.

**NATST 419.3
First Nations Women and the Law
1/2(1L-2S)**

Prerequisite(s): NATST 219 and 225.
Accomplishes two broad objectives. It critically examines the situation of First Nations Women in Canadian law. Concurrently, students learn the structure of the Canadian legal system as well as legal research skills. Topics examined include statutory discrimination, political rights and the justice system.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

NATST 398.3 1/2(3S)

NATST 399.6 1&2(3S)

NATST 498.3 1/2(3S)

NATST 499.6 1&2(3S)

GRADUATE COURSES

Department of Native Studies, College of Graduate Studies & Research

**NATST 802.3
Applied Native Studies Research
Methods
1/2(3S)**

Emphasizes the development of skills to conduct research on, for and with Native peoples. Technical skills, evaluation skills and ethical issues will be addressed.

**NATST 803.3
Theoretical Issues in Native Studies
1/2(3S)**

Critically examines theoretical developments in Native Studies and relevant cognate disciplines, such as Sociology, History, and Anthropology where Native issues are being addressed.

**NATST 898.3/899.6
Special Topics**

Concentrated reading and research in selected areas of Native Studies.

**NATST 990
Seminar**

All students will be required to register for and attend for one year NATST 990 (Graduate Seminar) and offer one seminar on their thesis research prior to graduation.

**NATST 994
Research**

Students writing a Master's thesis must register for this course.

NURSING

College of Nursing

NEPS

**NURS 111.6
Introduction to the Structure &
Function of the Human Body
1&2(3L/S-3C-P)**

Introduces basic concepts related to structure and function of the human body.

**NURS 112.3
Development of Self
1(3L/S-2C/P)**

Introduces the concept of self in relation to others. Through reflection and understanding of the nature of one's self, individuals can experience awareness and personal growth. Individual's uniqueness and differences, which influence human interaction, will be explored.

**NURS 113.3
Nursing: An Evolving Profession
1(4L/S-4C/P)**

Prerequisite(s) or Corequisite(s): NURS 112.
Introduces the roles and competencies of nursing practice and the context for nursing. The participants will become acquainted with the elements of caring through an interactive approach which promotes growth of all partners. Research language and concepts will be introduced.

**NURS 114.3
Interpersonal Relationships
2(3L/S-2C/P)**

Prerequisite(s) or Corequisite(s): NURS 112 or the instructor's permission.
Emphasizes an understanding and application of interpersonal skills for personal and professional growth and development. Communication which facilitates helping relationships will be practiced within a variety of settings.

**NURS 115.3
Core Concepts of Care
2(3L/S-8C/P)**

Prerequisite(s) or Corequisite(s): NURS 111, 113, 114, 116.
Focuses on application of fundamental nursing concepts and skills in assisting

individuals across the lifespan with health challenges. Concepts of safety, self-care, and immobility will be explored. Within a practice setting, participants will integrate concepts from other courses.

**NURS 116.3
Introduction to Health Concepts
2(3L/S)**

Introduces the concepts of Health and Primary Health Care as they relate to individuals, families, groups and communities.

**NURS 211.3
Counseling in Nursing Practice
2(3L/S-2C/P)**

Prerequisite(s): NURS 112 or 114; one of ENG 111, 112, 113 or 114; Social Science (6 credit units).

Prerequisite(s) or Corequisite(s): NURS 216; 217.

Provides opportunities for exploring the counseling role for nurses within a therapeutic relationship.

**NURS 212.3
Microbiology for Health Sciences
1(2L/S-2C/P)**

Introduces the concepts of microbiology in relation to health and the process of disease in humans.

**NURS 213.6
Therapeutics and Nursing
Intervention
1&2(2L/S-2C/P)**

Prerequisite(s): NURS 111.

Prerequisite(s) or Corequisite(s): NURS 212.

Introduces basic concepts related to nursing pharmacotherapeutics and additional therapies which promote, maintain and restore health.

**NURS 215.3
Health Challenges of Adults I
1(3L/S-9C/P)**

Prerequisites: NURS 115; one of ENG 111, 112, 113 or 114; Social Science (6 credit units).

Prerequisite(s) or Corequisite(s): NURS 114; 212; 213; 216; 217.

Focuses on the application of nursing concepts in assisting adults with health challenges. Concepts of acuity and chronicity, perioperative nursing and rehabilitative nursing will be explored.

**NURS 216.3
Healthy Growth and Development
1(4L/S)**

Prerequisite(s): one of ENG 111, 112, 113 or 114; Social Science (6 credit units).

Prerequisite(s) or Corequisite(s): NURS 116 or the instructor's permission.

Focuses on theories of growth and development of individuals throughout the lifespan, within the context of family and community.

**NURS 217.6
Individual Assessment
1&2(1L/S-3C/P)**

Prerequisite(s) or Corequisite(s): NURS 111, 216.

Establishes a foundation for continued development of health assessment skills.

**NURS 218.3
Education for Health
2(3L/S-1.5C/P)**

Prerequisite(s): ENG 111, 112, 113 or 114;

Social Science (6 credit units).

Prerequisite(s) or Corequisite(s): NURS 112, 114, 216; or permission of the instructor.

Primary focus is on health education for health promotion. A variety of strategies in the access and development of resources to facilitate achievement of health goals of clients across the lifespan will be used. The participants will be given opportunity to achieve personal and professional growth as a learner-teacher, through collaborative interactions with clients.

**NURS 219.3
Health Challenges of Adults II
2(3L/S-10.5C/P)**

Prerequisite(s): NURS 215.

Prerequisite(s) or Corequisite(s): NURS 213, 217, 218; NUTR 120.

Focuses on the application of nursing concepts in assisting adults with health challenges. Concepts of gerontology and palliative care will be explored.

**NURS 233.6
Practicum I
3(5L/S-30C/P)**

Prerequisite(s): NURS 211, 213, 217, 219.

Provides opportunities for the integration of theory and practice (praxis) in holistic nursing care of individuals.

**NURS 316.3
Health Challenges of Adults III
1/2(4L/S-11C/P)**

Prerequisite(s): NURS 233.

Prerequisite(s) or Corequisite(s): NURS 317; 327.

Focuses on the application of nursing concepts in assisting adults and their families with complex and/or rapidly changing health challenges. Health challenges of childbearing families will also be explored.

**NURS 317.3
Family Diversity
1(3L/S-4C/P)**

Prerequisite(s): NURS 211; 217.

Prerequisite(s) or Corequisite(s): NURS 316 or 324; or the instructor's permission.

Focus on theories of families within the context of community and society. Opportunities will be provided for assessment and beginning interventions with families.

**NURS 319.3
Issues in Nursing
2(3L/S)**

Prerequisite(s): NURS 113, 233.

Prerequisite(s) or Co-requisite(s): NURS 327, 316 and/or 324.

An opportunity for all participants to reflect upon the roles and competencies of the professional nurse within the context of their own evolving nursing experience. Legal, moral, and ethical principles will be applied to the analysis of current issues that have implications for caring in nursing practice.

**NURS 320.3
Introductory Management Concepts
2(3L/S)**

Prerequisite(s): NURS 327 or permission of the instructor.

Prerequisite(s) or Corequisite(s): NURS 316 or 324.

Provides the foundation for management of client care in a variety of settings.

**NURS 324.3
Health Challenges of Infants to
Adolescents
1/2(4L/S-11C/P)**

Prerequisite(s): NURS 233.

Prerequisite(s) or Corequisite(s): NURS 317.

Focuses on the application of nursing concepts in assisting individuals from infancy to adolescence, within the context of the family, with prevalent health challenges.

**NURS 325.3
Practice in Communities
2(3L/S-4C/P)**

Prerequisite(s): NURS 317.

Focuses on practice in community settings, utilizing relevant Primary Health Care Concepts, family and community based theories and existing community resources.

**NURS 326.6
Practicum II: Integrated Practice**

This course is only for students who have chosen to exit the program after the third year and write registration exams. For details, contact SIAST Kelsey Campus or SIAST Wascana Campus.

**NURS 327.3
Participating with Groups
1(2L/S-2C/P)**

Prerequisite(s) or Corequisite(s): NURS 112, 114; or permission of the instructor.

Promotes opportunities for personal and professional growth and development within a variety of group settings. Experiences as participant and facilitator within groups will be provided.

**NURS 418.3
Management in Health Systems
1(3L/S)**

Prerequisite(s): NURS 320.

Corequisite(s): NURS 420 or permission of the instructor.

Emphasizes the study of management concepts as they relate to the context of health.

**NURS 419.3
Research for Professional Practice
1(3L/S)**

Prerequisite(s) or Corequisite(s): 3 credit units in statistics.

Introduces research concepts, methodology, and issues in health. Emphasis will be on critical appraisal of existing research.

**NURS 420.3
Partnerships with Community
1(3L/S-8C/P)**

Prerequisite(s): NURS 316, 324, 325; or permission of the instructor.

Focuses on clinical practice in community, utilizing change and critical social theory. Emphasis will be on social participation including program development.

**NURS 421.6
Focus on Social Participation
1/2(2L/S-33C/P)**

Prerequisite(s): NURS 418, 419, 420.

Provides opportunities for the participant to expand the integration of research and primary health care concepts in the community.

Note: 8 week block.

**NURS 422.3
Integration with a Clinical Focus
1/(2L/S-33C/P)**

Prerequisite(s): NURS 418, 419, 420.

Provides opportunities for participants to expand the integration of theory and practice in nursing care of individuals, families, groups, and communities. Participants will choose a specific area of focus.

Note: 4 week block.

**NURS 423.3
Management/Research Integration
1/2(2L/S-33C/P)**

Prerequisite(s): NURS 418, 419, 420.

Restricted to students who have completed diploma exit requirements.

Provides opportunities for expanding the integration of theory and practice in nursing care of individuals, families, groups and communities. Emphasis is on the integration of management and research concepts.

Note: 4 week block.

**NURS 425.6 Clinical Integration
1/2(2S-33L)**

Prerequisite(s): NURS 418.3; NURS 419.3; NURS 420.3.

This course provides opportunities for participants to expand the integration of theory and practice in nursing care of individuals, families, groups, and communities. Emphasis will be placed on the integration of management and research concepts into clinical practice. Participants will choose a specific area of focus.

Note: 8 week block.

**POST REGISTRATION B.S.N.
PROGRAM**

It is the student's responsibility to determine if they have the appropriate prerequisite(s) for the courses they wish to take. Misrepresentation may lead to disciplinary action.

**NURS 313.3
Health Assessment 1**

Prerequisite(s) or Corequisite(s): NURS 328.

Provides opportunities for participants to increase their knowledge and skills in health history taking and holistic assessment of individuals within the context of families, throughout the lifespan.

**NURS 314.3
Health Assessment 2**

Prerequisite(s) or Corequisite(s): NURS 313 or permission of the instructor.

Provides opportunities for participants to increase their knowledge and skills in health history taking and physical assessment of individuals throughout the lifespan.

**NURS 328.3
Concepts for Professional Nursing**

Provides a basis for the continued study of professional nursing. Opportunities will be provided for participants to examine the nursing knowledge, skills, and attitudes relevant to the role of the nurse within the health system. Selected concepts will be explored as a basis for critical analysis and judgement in nursing practice.

**NURS 410.3
Leadership and Partnerships in Nursing**

Prerequisite(s) or Corequisite(s): NURS 328.
Provides opportunities for participants to increase their understanding of issues in leadership and group process from a nursing perspective.

**NURS 411.3
Issues in Professional Nursing**

Prerequisite(s) or Corequisite(s): NURS 328.
Provides opportunities for participants to examine the current issues in nursing. Legal, moral and ethical principles will be considered in the analysis of nursing issues. Elements of the nursing role will be explored. Participants will be encouraged to clarify personal values regarding nursing.

**NURS 412.3
Management for Nurses**

Prerequisite(s) or Corequisite(s): NURS 410, 413, or permission of the instructor.
Provides opportunities for participants to prepare for practice in management roles in a variety of settings.

**NURS 413.3
Learning and Teaching for Health**

Prerequisite(s) or Corequisite(s): NURS 328.
Provides opportunities for participants to increase their understanding of the learning-teaching process and its application for health. Participants will be given the opportunity to achieve personal and professional growth as learners/teachers.

**NURS 426.3
Introduction to Health Program Planning and Evaluation**

Prerequisite(s) or Corequisite(s): NURS 412, 449, 491; or permission of the instructor.
Provides opportunities for participants to increase their understanding of planning and evaluating health-related programs.

**NURS 448.3
Nursing in the Community**

Prerequisite(s) or Corequisite(s): NURS 413 or permission of the instructor.
Provides opportunities for participants to increase their understanding of the concepts of Health and Primary Health Care as they relate to the community.

**NURS 449.3
Community Practice**

Prerequisite(s) or Corequisite(s): NURS 314, 448; or permission of the instructor.
Provides opportunities for participants to apply concepts of Health and Primary Health Care in community practice.

**NURS 473.3
Clinical Option: Cancer Nursing and Palliative Care**

Prerequisite(s) or Corequisite(s): NURS 314; 412; 413; 449; or permission of the instructor.
Provides opportunities for participants to increase their knowledge and skills related to cancer nursing and palliative care.

**NURS 475.3
Clinical Option: Cardiovascular Nursing**

Prerequisite(s) or Corequisite(s): NURS 314; 412; 413; 449; or permission of the instructor.
Provides opportunities for participants to increase their knowledge and skills related to cardiovascular nursing.

**NURS 476.3
Clinical Option: Gerontological Nursing**

Prerequisite(s) or Corequisite(s): NURS 314; 412; 413; 449; or permission of the instructor.
Provides opportunities for participants to increase their knowledge and skills related to nursing in a gerontological setting.

**NURS 477.3
Clinical Option: Perinatal Nursing**

Prerequisite(s) or Corequisite(s): NURS 314; 412; 413; 449; or permission of the instructor.
Provides opportunities for participants to increase their knowledge and skills related to perinatal nursing.

**NURS 478.3
Clinical Option: Rural Nursing**

Prerequisite(s) or Corequisite(s): NURS 314; 412; 413; 449; or permission of the instructor.
Provides opportunities for participants to increase their knowledge and skills related to nursing in rural settings.

**NURS 479.3
Clinical Option: Mental Health Nursing**

Prerequisite(s) or Corequisite(s): NURS 314; 412; 413; 449; or permission of the instructor.
Provides opportunities for participants to increase their knowledge and skills related to mental health nursing.

**NURS 482.3
Senior Nursing Practicum**

Prerequisite(s) or Corequisite(s): All other required Nursing courses.
Provides opportunities for participants to apply and integrate concepts from the total program. Participants will select an area of direct care, education, administration, or research in which to pursue study and practice.

**NURS 491.3
Research in Nursing**

Prerequisite(s) or Corequisite(s): 3 credit units in Statistics.
Provides opportunities for participants to become informed consumers of research and apply the process of systematic investigation to nursing problems and community issues. Research concepts, methods and issues will be examined with an emphasis on critical appraisal of published research.

**NURS 492.3
Using Research in Practice Settings**

Prerequisite(s): NURS 328, 491; or permission of the instructor.
Provides opportunities for participants to increase their understanding of the

relationships between research and practice.

**NURS 498.3
Special Topics**

Prerequisite(s) or Corequisite(s): NURS 314; 412; 413; 449.
Provides opportunities for participants to increase their knowledge and skills related to a special topic area in nursing.

GRADUATE COURSES

College of Graduate Studies & Research

**NURS 812.3
Nursing Administration
1/2(3L-4P)**

Prerequisite(s): NURS 412; or equivalent.
Facilitates the critical analysis of management concepts, functions and skills required in the nursing role. The student is expected to apply the nursing process within an administrative framework. Ongoing integration of theoretical and research principles in a practical setting is required.

**NURS 813.3
Clinical Teaching
1/2(3L-4P)**

Surveys issues, trends and methods of nursing education. An examination of the nature of clinical instruction in nursing will be the main focus. A practicum is an integral part of the course.

**NURS 880.6
Clinical Nursing
1&2(3L-8P)**

Explores concepts, models and theories applicable to clinical nursing practice. Opportunity will be provided to test and evaluate selected frameworks in the practice area of the student's choice.

**NURS 881.3
Advanced Clinical Nursing
1/2(1.5S-12P)**

In-depth analysis of selected theoretical frameworks applicable to the student's field of inquiry will be undertaken. Students will have an opportunity to refine existing frameworks for nursing practice, to develop new models and to test these in the clinical setting. Emphasizes skill development and integration of theory and research in practice.

**NURS 890.3
Independent Reading and Study**

Provides an opportunity for a student to pursue a topic of interest outside the scope of other courses offered. It could be a topic of a multidisciplinary nature. The student is responsible for defining the area of interest. Approval of the student's advisor must be obtained before registering for the course. A paper or papers will be required for satisfactory completion of the course.

**NURS 891.3
Theory Development in Nursing
1/2(3S)**

Considers the current stage of theory development in nursing. Based on a historical survey of the subject. The application of theories or conceptual models to nursing practice will be discussed.

**NURS 892.3
Nursing Research
1/2(3S)**

Focuses on research methodology with application to clinical nursing problems. Major emphasis will be placed on elements of the research process, critical analysis and evaluation of nursing research, research design and developing proposals of nursing research investigation.

**NURS 898.3/899.6
Special Topics**

A combination of seminars, guided reading and special projects in selected areas of nursing. The topics to be considered will relate to the special interests of students enrolled in the course. A practicum or internship may be one of the learning methods used. Reports on readings and projects will be required.

**NURS 990
Seminar**

Reports and discussion of current nursing research. Graduate students are required to attend and participate throughout their program.

**NURS 992.6
Project**

Students in the project option must register for this course. It consists of independent study and investigation of a nursing problem. An acceptable report of the investigation must be submitted. The paper will be examined by a supervisor and two other faculty members of the College.

**NURS 994
Thesis**

Students writing a Master's thesis must register for this course.

NUTRITION

Division of Nutrition, College of Pharmacy & Nutrition

**NUTR 120.3
Basic Nutrition
1/2(3L)**

An introduction to nutrition and health. The concepts of recommended nutrient intakes and dietary guidelines are introduced. The major nutrients and their functions in the body are outlined. Nutrition issues facing the general public are presented.

**NUTR 216.3
Fundamentals of Foods
1(3L-3P)**

Prerequisite(s): CHEM 112; BIOL 110; NUTR 120, or the Division's permission.
Addresses issues and concepts relating to foods in order to understand food availability, nutrition recommendations, consumer trends, and food service practices. Foods will be studied as to their chemical and physical properties and their nutrient contribution to the human diet.

**NUTR 220.3
Advanced Nutrition
2(3L-1.5P)**

Prerequisite(s) or Corequisite(s): NUTR 120; BIOCH 211 and H SC 280.6 or

permission of the Division.

An advanced nutrition course with emphasis on the underlying physiological and biochemical roles of nutrients. The principles of digestion, absorption, transport, and metabolism of major nutrients will be discussed, as well as the food sources of nutrients and chemical and physiological interactions of nutrients from various food sources.

**NUTR 230.3
Professional Practice 1
1(3L/S)**

Prerequisite(s): First-year standing in the revised B.Sc.(Nutr.) program.

An introduction to the profession of dietetics. Review of historical, political, social aspects of health care; health care structures; and current issues relating to the nutrition discipline and the dietetics profession.

**NUTR 300.3
Professional Communications
2(2L-2T)**

Prerequisite(s) or Corequisite(s): Minimum third-year standing and a public speaking course.

A study of factors affecting understanding and communication with others. Provides opportunities to practise various communication techniques and develop the skills necessary to communicate with other health professionals and patients.

**NUTR 305.3
Research Methods
1(3L)**

Prerequisite(s) or Corequisite(s): NUTR 220; STATS 246; or equivalent, or the Division's permission.

A study of research methods in science and nutrition. Focuses on interpreting, evaluating, applying and communicating scientific research.

**NUTR 322.3
Nutrition Throughout the Lifespan
1(3L)**

Prerequisite(s): NUTR 220 or the Division's permission.

An application of the principles of nutrition to nutritional demands, nutrition assessment and nutrition education throughout the lifespan. The approach will focus on nutrition during pregnancy, lactation, infancy, childhood and adolescence as well as in the elderly.

**NUTR 330.3
Professional Practice 2
1&2(1.5P/T)**

Prerequisite(s): NUTR 230 and second year standing in the revised B.Sc.(Nutr.) program.

Begins the process of enabling students to articulate and document the required competencies for entry-level dietetic practice, based on experiences obtained in the Nutrition Resource and Volunteer Centre (N.R.V.C.). Introduction to self-directed learning; preparation of learning contracts outlining experiences to be completed to meet specific course objectives.

**NUTR 350.3
Introduction to Community Nutrition
2(3L)**

Prerequisite(s) or Corequisite(s): NUTR 322.

Introduction to the field of community nutrition and its role in health and health care. The focus is on the process and theoretical foundations of nutrition education and the theories, methods and research perspectives applicable to nutrition education. The role of the community nutritionist in determining, delivering and managing community nutrition services is emphasized along with the tools, skills and techniques necessary for developing effective services.

**NUTR 365.3
Quantity Food Production and Service
2(3L-3P)**

Prerequisite(s): NUTR 216 or the Division's permission.

Studies the management responsibilities in quantity food production with emphasis on menu planning, purchasing, service, preparation for quality, cost and sanitation control.

**NUTR 420.3
Current Issues in Nutrition
2(3L)**

Prerequisite(s) or Corequisite(s): NUTR 425 and 440, or the Division's permission.

An in-depth examination of contemporary issues such as diet and heart disease, influence of lifestyle factors on nutrition, nutrition labelling and health claims, and nutraceuticals. Controversies in nutrition and cultural aspects of food are also discussed.

**NUTR 425.3
Nutritional Assessment
1(3L-1.5T)**

Prerequisite(s): Minimum third-year standing.

Theory and methods of nutritional assessment for individuals and groups, including methods for assessment of dietary intake, biochemical, anthropometric and clinical evaluation.

**NUTR 430.3
Professional Practice 3
1&2(1.5P/T)**

Prerequisite(s): NUTR 330 and third year standing in the revised B.Sc.(Nutr.) program.

Builds on NUTR 330 by continuing the process of enabling students to articulate and document the required competencies for entry-level dietetic practice, based on experiences obtained in both formal learning and work/volunteer activities. Students are expected to complete a wide variety of increasingly challenging experiences, either through the N.R.V.C. or other agencies and organizations, aimed at meeting the specific objectives of the course.

**NUTR 440.6
Clinical Nutrition
1&2(3L-1.5P)**

Prerequisite(s) or Corequisite(s): NUTR 425.

A discussion of the role of nutrition in the etiology, pathophysiology, treatment and prevention of human disease. Principles underlying nutritional care will be emphasized.

**NUTR 450.3
Nutrition Program Planning and Evaluation
1(3L/P)**

Prerequisite(s): NUTR 350.

Provides an understanding of the theories, principles, and techniques involved in planning and evaluating nutrition programs. Students will work together to plan a nutrition program for a local agency or organization.

**NUTR 466.3
Organization and Management of Food Service Systems
1(3L)**

Prerequisite(s): NUTR 365; COMM 101 or 102 or Corequisite(s); minimum fourth year standing or the Division's permission.

A study of philosophy and functions of management as applied to food services, principles of organization, human resource management, work improvement, utilization of resources and labour-management relations.

**NUTR 480.3
Directed Studies in Nutrition
1/2(6P/R) or 1&2(3P/R)**

Prerequisite(s): Permission of the course coordinator and supervising faculty member.

Provides individual students with an opportunity to undertake independent and advanced study in nutrition. Projects may involve laboratory or field work and/or library research. The student must choose the project in consultation with a faculty member. *Note:* Students with credit for NUTR 481 may not take this course for credit.

**NUTR 481.6
Directed Studies in Nutrition
1&2(6P/R)**

Prerequisite(s): Permission of the course coordinator and supervising faculty member.

Provides individual students with an opportunity to undertake independent and advanced research in nutrition. Projects will involve laboratory or field work and library research. The student must choose the project in consultation with a faculty member. *Note:* Students with credit for NUTR 480 may not take this course for credit.

**NUTR 530.33
Professional Practice 4
1&2(C/T) 36 weeks**

Prerequisite(s): Completion of all required courses from Years 1, 2, and 3; criminal records check.

Thirty-six week practice-based experience with either Saskatoon District Health or Regina Health District (plus experiences in other health districts and Tribal Councils in the province). The course provides students with opportunities to acquire the knowledge, skills and behaviors required to practice as a dietitian. All areas of entry-level practice will be experienced across the spectrum of nutritional care.

Note: The 36-week practice-based experience includes a 2-week break.

GRADUATE COURSES

College of Graduate Studies & Research

**NUTR 810.3
Advances in Human Nutrition Research
1/2(3L/S)**

Prerequisite(s): Undergraduate courses in

nutrition at the second-year level and above.

Recent human nutrition research is described and discussed, with emphasis on micronutrient nutrition. Students will read the current literature and participate in classroom lectures and seminars.

**NUTR 820.3
Current Issues in Nutrition
2(3L)**

Prerequisite(s): Senior nutrition course; or the instructor's permission.

An in-depth examination of contemporary issues such as diet and heart disease, influence of lifestyle factors on nutrition, nutrition labelling and health claims, and nutraceuticals. Controversies in nutrition and cultural aspects of food are also discussed.

**NUTR 825.3
Nutritional Assessment
2(3L-1.5T)**

Prerequisite(s): Senior nutrition course; or the instructor's permission.

Theory and methods of nutritional assessment for individuals and groups, including methods for assessment of dietary intake, biochemical, anthropometric and clinical evaluation.

**NUTR 850.3
Nutrition Program Planning and Evaluation**

Prerequisite(s): NUTR 350; or the instructor's permission.

Provides an understanding of the theories, principles and techniques involved in planning and evaluating nutrition programs. Students will work together to plan a nutrition program for a local agency or organization.

**NUTR 898.3/899.6
Special Topics
1/2(R), 1&2(R)**

Advanced level of guided reading and special projects in selected areas of nutrition.

**NUTR 990
Seminar**

Staff and graduate students present papers and discuss current research topics at meetings held regularly throughout the year. Graduate students under the direction of the Division are required to attend these seminars.

**NUTR 994
Research**

Students writing a Master's thesis must register for this course.

**NUTR 996
Research**

Students writing a Ph.D.(Special Case) thesis in Nutrition must register for this course.

OBSTETRICS, GYNECOLOGY AND REPRODUCTIVE SCIENCES

Department of Obstetrics, Gynecology & Reproductive Sciences, College of Medicine

COURSES • *Obstetrics, Gynecology and Reproductive Sciences*

These courses are restricted to students enrolled in the College of Medicine.

OB&GY 501.6 Obstetrics and Gynecology PD (6 weeks)

Provides final year medical students with direct clinical experience and participation in management of gynecologic and obstetric problems. The clinical teaching will take place in a teaching hospital affiliated with the University of Saskatchewan. Regular seminars, ward rounds, and departmental rounds will be used for teaching, as well as direct patient care, in both disciplines.

GRADUATE COURSES

Department of Obstetrics, Gynecology & Reproductive Sciences, College of Graduate Studies & Research

OB&GY 801.3 Reproductive Molecular Biology 1(3L)

This course, intended primarily for graduate students in Life and Health Sciences, will develop theoretical ability applying basic knowledge in molecular biology to reproductive biology. Among the topics covered are molecular biology of reproductive hormones, transgenesis, molecular biology of fertilization and embryo development and molecular basis of hormone therapeutic interventions.

PALAEOBIOLOGY

Department of Geological Sciences,
College of Arts & Science

PBIO 250.3 The World of Dinosaurs 1(3L)

Prerequisite(s): 6 credit units in 100-level science course(s).

A survey of the Mesozoic world - its geography, climates, plants and vertebrate faunas. Particular attention will be given to the history of discovery, and growth of understanding of, the dinosaurs; but attention will also be given to the other terrestrial reptiles, the marine and flying reptiles, and the early mammals and birds. Questions of evolution and extinction will be considered.

PBIO 488.3 Palaeobiology Research 1/2(1S)

Prerequisite(s): Open to Palaeobiology students, normally in their fourth year of studies, with written permission of the Chair of the Palaeobiology Administrative Committee.

A field or laboratory research project conducted under the supervision of a faculty member. A written report will be submitted to the supervisor. The student will then present to an examining committee an oral account of the research.

PBIO 489.6 Palaeobiology Research 1&2(1S)

Prerequisite(s): Open to Palaeobiology students, normally in their fourth year of studies, with written permission of the

Chair of the Palaeobiology Administrative Committee.

A field or laboratory research project conducted under the supervision of a faculty member. A written report will be submitted to the supervisor in the form of an honours thesis. The student will then present to an examining committee an oral account of the research.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the program coordinator or administrative committee for more information.

PBIO 298.3 1/2(3S)
PBIO 299.6 1&2(3S)
PBIO 398.3 1/2(3S)
PBIO 399.6 1&2(3S)
PBIO 498.3 1/2(3S)
PBIO 499.6 1&2(3S)

PATHOLOGY

Department of Pathology, College of Medicine

These courses are restricted to students enrolled in the College of Medicine and Dentistry.

PATH 205.3 Survey of Pathology 1/2(3L)

General and special pathology for pharmacists and physical therapists.

PATH 301.6 General Pathology 1 PB

Lectures, gross and microscopic demonstrations, and seminars for second year dental and medical students, dealing with the general pathological conditions common to all systems of the body. An introduction to systemic pathology is also included.

PATH 302.6 Systemic Pathology 2 PB

Study of the pathogenetic mechanisms and pathology involved in clinical disease processes as applied to patient management.

GRADUATE COURSES

Department of Pathology, College of Graduate Studies & Research

PATH 740.6 Chemical Pathology 1&2(2S-12P)

Prerequisite(s): Acceptance to graduate or resident program in pathology. Admission to course by permission of the department.

Practical, applied Chemical Pathology, intended for students in General Pathology programs, and is a prerequisite for PATH 841. Deals with the routine operation of a Clinical Chemistry laboratory. All the common Clinical Chemistry procedures are examined with respect to laboratory techniques and clinical applications.

PATH 803.3 Neuropathology 1/2(2T)

Gross specimens and microscopical slides of neuropathological material will be studied and discussed.

PATH 811.6 Clinical Pathology (Haematology) 1&2(3T)

Covers the applied pathology of blood diseases with emphasis on more recent advances in this field. Course only given by special arrangement with the department.

PATH 841.6 Chemical Pathology 1,2&3(2S-12P)

Prerequisite(s): PATH 740. Permission of the department is required for registration. With permission the student may register for PATH 740 and 841 concurrently.

Consists of theoretical chemical pathology and is intended for students specializing in chemical pathology. Deals with management and operation of a hospital chemical laboratory. All the modern analytical techniques are studied with emphasis on principles, quality control, instrumentation and clinical interpretation. Both classical techniques and recent advances are included. A 32-week schedule is provided each student who will be required to do three half-days per week in the laboratory. Details of reading requirements are also provided with the study schedule.

PATH 898.3 Special Topics

PATH 910.6 Pathology Seminar 1&2(S)

A monthly seminar of interesting pathological cases or presentations of scientific work of the department.

PATH 911.6 Pathology Conferences 1&2(3S)

A review and discussion of current cases with clinical, radiological, haematological, cytological and neuropathological correlation.

PATH 990 Seminar

A seminar is held jointly with other medical departments. Graduate students are required to attend and take part in the seminar throughout their program.

PATH 994 Research

Students writing a Master's thesis must register for this course.

PATH 996 Research

Students writing a Ph.D. thesis must register for this course.

PEDIATRICS

Department of Pediatrics, College of Medicine

These courses are restricted to students enrolled in the College of Medicine.

PEDS 302.3 Human Genetics 1&2 PB

Provides an applied clinical perspective of genetic disorders. Genetic diseases affecting humans, although diverse in their manifestations, share common etiology and subscribe to a few mechanisms of pathogenesis.

PEDS 501.6 Pediatrics PD (6 weeks)

A clinical rotation which is divided into segments such that students are exposed to the hospital care of the newborn, the young child, the older child, and to outpatient care. Special lectures are provided in all aspects of pediatric care.

PHARMACOLOGY

Department of Pharmacology, College of Medicine

Some courses are open to students in the College of Arts & Science.

PHCOL 301.6 Pharmacology 1&2 PB

Prerequisite(s): Restricted to students enrolled in the College of Medicine.

Students will learn the scientific rationale for the use of drugs. Lectures are followed by case based tutorials. The objective is to provide a sound knowledge of pharmacologic concepts and principles fundamental to the application of drugs as a component of the therapeutic regimen.

PHCOL 350.6 Pharmacology 1&2(3L-3T alt.wks.)

Prerequisite(s): H SC 208, BIOCH 211, or equivalent. For students taking a B.Sc. Honours or Four-year Program in the College of Arts & Science.

The pharmacokinetics, pharmacodynamics, therapeutic uses and toxicity of drugs. Pharmacological methods and principles are illustrated and discussed in tutorial sessions.

PHCOL 432.6 Special Topics in Pharmacology 1&2(3R/P)

Prerequisite(s): For students taking a B.Sc. Honours or Four-year Program in the College of Arts & Science.

Work in selected areas of pharmacology may be undertaken by advanced students with the consent of the department. May consist of essays, readings, and reports on assigned topics relating to a common subject and/or a series of laboratory exercises.

GRADUATE COURSES

Department of Pharmacology, College of Graduate Studies & Research

**PHCOL 768.3
Psychopharmacology
1/2(3L)**

An introduction to the effects of drugs on brain function and behaviour. Designed to assist clinical psychologists in understanding the actions and mechanisms of various psychoactive drugs.

**PHCOL 832.6
Special Topics in Pharmacology
1&2(3R-3P-3S)**

Work in selected areas of pharmacology may be undertaken by advanced students with the consent of the department. This work may consist of essays, readings, and reports on assigned topics relating to a common subject and/or series of laboratory exercises.

**PHCOL 843.6
Current Pharmacology
1&2(3R-3S)**

Supervised departmental tutorials reviewing current literature and topics of interest. Students are required to prepare and present their reviews and to participate in the discussions.

**PHCOL 850.6
Pharmacology
1&2(3L-1S)**

A lecture, laboratory and seminar course dealing with pharmacokinetics, pharmacodynamics, therapeutics and toxicology of drugs. Emphasis will be placed on the basic principles of pharmacology, particularly mechanisms of action and structure-activity relationships.

**PHCOL 851.3
Recent Advances in Pharmacology
1/2(3L, 3 weeks)**

Prerequisite(s): PHCOL 301 or 350; or permission of the instructors. Students should not take this course until the 2nd year of their graduate program and have completed PHCOL 850.

Deals practically with the most recent developments in drug therapy. Emphasizes new approaches to pharmacotherapy as well as to new individual drugs. Instruction in the technique of new drug appraisal will be given with heavy emphasis on the areas of pharmacodynamics, pharmacokinetics, toxicology and therapeutics.

**PHCOL 853.3
Neuropharmacology
1/2(3L)**

Prerequisite(s): PHCOL 301 or 350 or 850; or permission of the instructors.

An advanced course on drug-induced changes in neural functioning. Focuses on research procedures useful in determining the mechanisms of action of drugs affecting the central nervous system, the autonomic nervous system and the neuromuscular junction. Extensive use of the recent literature will be made.

**PHCOL 854.3
Cardiovascular Pharmacology
1/2(3L)**

Prerequisite(s): PHCOL 301 or 350 or 850; or permission of the instructors.

An advanced course on the interaction of drugs with the regulatory systems of the circulation. Evaluation of methods used to

monitor cardiovascular function are emphasized.

**PHCOL 856.6
Molecular Aspects of Anticancer and
Antiviral Chemotherapy
1&2(3L-3P-2S)**

Prerequisite(s): PHCOL 301 or 350 or 850; or written approval of the course coordinators.

An advanced course dealing with molecular mechanisms of action of chemotherapeutic agents with particular emphasis on anticancer and antiviral drugs. Assigned readings and seminar's will accompany didactic sessions.

**PHCOL 898.3
Special Topics****PHCOL 990
Seminar**

Graduate students in the department are required to attend, and to take part in the seminars throughout their program.

**PHCOL 994
Research in Pharmacology**

Students writing a Master's thesis must register for this course.

**PHCOL 996
Research**

Students writing a Ph.D thesis must register for this course.

PHARMACY

Admission to the Bachelor of Science in Pharmacy program is a prerequisite for registration in courses designated PHARM. Selected courses may be available to other students by special permission.

**PHARM 200.1
Pharmacy Skills I
1&2 (3 L/T)**

Prerequisite(s) or Corequisite(s): Completion of pre-pharmacy courses, and acceptance into the first-year of the Pharmacy program; PHARM 201.5, PHARM 203.5, PHARM 216.2, PHARM 280.2.

This course will provide an introduction to the profession of Pharmacy and the Pharmacy program with emphasis on necessary learning skills and the educational outcomes of the program. Students will also begin development of library (including online resources) and computer skills necessary for the pharmacist's role as a drug information provider.

**PHARM 201.5
Foundations of Pharmacy I:
Physicochemical Principles of Drugs
1 (5 L/S, 3P, 1.5 T alt weeks)**

Prerequisite(s) or Corequisite(s): Completion of pre-pharmacy courses, registration in first-year Pharmacy; CHEM 111.3, 251.3; CHEM 252.3.

One of three foundation courses in Pharmacy, this course provides a link between the principles of basic chemistry and those of pharmaceutical chemistry. Modules deal with the chemical properties of drugs, an introduction to pharmacokinetics (how drugs are handled

in the body), analytical procedures used to determine drug levels in body fluids and to assess quality assurance of drugs, and the pharmaceutical calculations associated with these concepts.

**PHARM 203.5
Foundations of Pharmacy III:
Pharmaceutical Dosage Forms and
Dispensing I
2 (5 L/S, 3P, 1.5 T alt weeks)**

Prerequisite(s) or Corequisite(s): Completion of pre-pharmacy courses, registration in first-year Pharmacy; PHARM 201.5; PHARM 216.2.

An introduction to the design and preparation of dosage forms for drugs, especially solutions, dispersions and solids such as tablets and capsules. This course will extend the discussions of the physicochemical principles of drugs introduced in PHARM 201.5 as they relate to the development of dosage forms. Students will also begin to develop their skills in the dispensing of prescriptions including the application of appropriate laws and standards of practice, and in the extemporaneous compounding of drug products and relevant pharmaceutical calculations.

**PHARM 216.2
Foundations of Pharmacy II:
Introduction to Pharmacy and the
Health Care System
1 (3 L/S, 1.5 T alt weeks)**

Prerequisite(s) or Corequisite(s): Completion of pre-pharmacy courses; registration in first-year Pharmacy; PHARM 201.5, PHARM 203.5, PHARM 200.1, PHARM 280.2.

An introduction to the profession of Pharmacy and the Canadian health care system, including the social, behavioural and economic aspects of pharmacy practice.

**PHARM 280.2
Structured Practical Experience I
1&2 (75 h C)**

Prerequisite(s) or Corequisite(s): Completion of pre-pharmacy courses, registration in first-year Pharmacy; PHARM 200.1, PHARM 216.2.

To gain an appreciation of what *Acare@* means to individuals, students will complete 75 hours of service-learning in a health care setting, or with a health care or service organization.

**PHARM 300.1
Pharmacy Skills II
1&2 (3L/T for first 4 weeks of each
term)**

Prerequisite(s) or Corequisite(s): Completion of first year Pharmacy, registration in second-year Pharmacy; PHARM 303.4, PHARM 307.2, PHARM 365.5, PHARM 372.2, PHARM 380.4.

This course will continue the development of necessary learning skills and those required for drug information retrieval and dissemination. Students will also develop skills in public speaking and in written communication.

**PHARM 303.4
Pharmaceutical Dosage Forms and
Dispensing II
1 (4L/S, 3P, 1.5T alt weeks)**

Prerequisite(s) or Corequisite(s): Completion of first-year Pharmacy, registration in second-year Pharmacy, PHARM 203.5; PHARM 216.3; PHARM 307.2, PHARM 365.5, PHARM 372.2.

An extension of PHARM 203.5, this course continues the discussion of the design and preparation of dosage forms for drugs, especially semi-solids and other topical dosage forms, devices and modified release dosage forms. This course will also extend the discussions of the physicochemical principles of drugs introduced in PHARM 201.5 as they relate to the development of dosage forms. Students will also continue to develop their skills in the dispensing of prescriptions including the application of appropriate laws and standards of practice, and in the extemporaneous compounding of drug products and relevant pharmaceutical calculations.

**PHARM 307.2
Pharmacokinetics and
Biopharmaceutics
1 (3L/S, 1.5 T every 4 weeks)**

Prerequisite(s) or Corequisite(s): Completion of first-year Pharmacy, registration in second-year Pharmacy; PHARM 201.5; PHARM 303.4, PHARM 372.2, PHARM 365.5.

A study of the physicochemical, pathological and pharmaceutical factors affecting the absorption, distribution, and elimination of drugs from the body. The use of pharmacokinetic principles to design dosage regimens which optimize therapeutic effects and minimize toxicity will be discussed. The concepts of bioequivalence of drug products will also be covered.

**PHARM 365.5
Patient Care I
2 (5L/S, 3P, 1.5T alt weeks)**

Prerequisite(s) or Corequisite(s): Completion of first-year Pharmacy, registration in second-year Pharmacy; PHARM 303.4, PHARM 372.2, PHARM 307.2, PHARM 380.4.

An introductory course in patient care, especially the areas of health promotion, disease prevention and self-care, and the role of the pharmacist in these areas. The treatment or prevention of various self-limiting health problems will be discussed. Students will begin to develop skills in patient care through interviewing and other communication skills activities.

**PHARM 372.2
Research Methods and Evidence-
Based Practice
2 (3 L/S, 1.5T alt weeks)**

Prerequisite(s) or Corequisite(s): Completion of first-year Pharmacy, registration in second-year Pharmacy; PHARM 200.1, STATS 245.3 or equivalent, PHARM 307.2; PHARM 300.1.

An introduction to research design and the critical appraisal of published research results in the pharmacy and medical literature. It is expected that students will apply knowledge of statistics to the field of pharmacy and biomedical research.

**PHARM 380.4
Structured Practical Experience II
2 (160 hours over 4 weeks in Spring
and Summer Session after
completion of all other second year
requirements)**

*Prerequisite(s) or Corequisite(s):
Completion of first-year Pharmacy and
registration in second-year Pharmacy;
PHARM 280.2, PHARM 365.5, PHARM
300.1, PHARM 302.4.*

A structured practice experience after completion of second year which will provide an opportunity for students to apply their technical skills and introduce them to patient care activities.

**PHARM 400.1
Pharmacy Skills III
1 (4T alt weeks)**

*Prerequisite(s) or Corequisite(s):
Completion of second-year Pharmacy,
registration in third-year Pharmacy;
PHARM 408.4, PHARM 409.3, PHARM
417.4, PHARM 418.2, PHARM 472.2,
PHARM 455.7, PHARM 456.7, PHARM
465.2, PHARM 480.4.*

This course will continue the development of necessary learning skills and those required to provide drug information to consumers through introductory experiences in the Drug Information Centre. Students will also complete a first aid course and an in-depth workshop to further their skills in interviewing and assessing individual patients about their drug therapies.

**PHARM 408.3
Pharmaceutical Dosage Forms and
Dispensing III: Sterile Dosage Forms
1 (3 L/S, 3P)**

*Prerequisite(s) or Corequisite(s):
Completion of second-year Pharmacy,
registration in third-year Pharmacy;
PHARM 203.5, PHARM 303.4, PHARM
307.2.*

An introduction to the design and preparation of sterile dosage forms, including parenteral preparations. This course will also extend the discussions of the physicochemical principles of drugs introduced in PHARM 201.5 as they relate to the development of sterile dosage forms. Students will develop their skills in the preparation and dispensing of sterile dosage forms including the application of standards of manufacture and practice and relevant pharmaceutical calculations.

**PHARM 409.3
Pharmaceutical Biotechnology
2 (3L/S, 1.5 P or T alt weeks)**

*Prerequisite(s) or Corequisite(s):
Completion of second-year Pharmacy,
registration in third-year Pharmacy;
PHARM 201.5, PHARM 203.5, PHARM
303.4, PHARM 307.2; PHARM 408.3.*

An introduction to the principles of biotechnology as they apply to the development of pharmaceutical products. Discussions will also focus on the uses of these products in the treatment of various conditions, the pharmacist's role in their provision, and the legal, ethical and economic issues associated with pharmaceutical biotechnology.

**PHARM 417.4
Management in Pharmacy
1&2 (3 L/S, 1.5 T alt weeks)**

*Prerequisite(s) or Corequisite(s):
Completion of second-year Pharmacy,
registration in third-year Pharmacy;
PHARM 365.5, PHARM 300.1, PHARM
303.4, PHARM 380.4; PHARM 418.2.*

An introduction to management principles and how they apply to practice management in pharmacy, and to the principles and issues associated with safe and appropriate drug distribution in various practice settings.

**PHARM 418.2
Issues in Pharmacy I
1&2 (1.5 L/S/T)**

*Prerequisite(s) or Corequisite(s):
Completion of second-year Pharmacy,
registration in third-year Pharmacy;
PHARM 417.4, PHARM 472.2, PHARM 465.2.*

A study of the ethical aspects of pharmacy practice and issues related to the professional responsibilities of the pharmacist.

**PHARM 455.7
Pharmacotherapeutics I
1 (8 L/S, 3P, 1.5T alt weeks)**

*Prerequisite(s) or Corequisite(s):
Completion of second-year Pharmacy,
registration in third-year Pharmacy;
PHARM 400.1, PHARM 465.2, PHARM
472.2.*

The first of three courses involving the study of the clinical application of drug therapy in various disease states, including discussion of relevant principles of medicinal chemistry, applied pharmacokinetics, adverse effects or interactions, and toxicology.

**PHARM 456.7
Pharmacotherapeutics II
2 (8 L/S, 3P, 1.5T alt weeks)**

*Prerequisite(s) or Corequisite(s):
Completion of second-year Pharmacy,
registration in third-year Pharmacy;
PHARM 400.1, PHARM 465.2, PHARM
472.2, PHARM 455.7.*

The second of three courses discussing the clinical application of drug therapy in various disease states, including discussion of relevant principles of medicinal chemistry, applied pharmacokinetics, adverse effects or interactions, and toxicology.

**PHARM 465.2
Patient Care II
2 (3L/S, 1.5 T alt weeks)**

*Prerequisite(s) or Corequisite(s):
Completion of second-year Pharmacy,
registration in third-year Pharmacy;
PHARM 365.5; PHARM 455.7, PHARM 456.7.*

The second of three courses dealing with Patient Care activities, including discussion of alternative or complimentary health care practices, prevention and treatment of drug misuse/abuse, and the prevention/treatment of drug overdose.

**PHARM 472.2
Evidence-Based Practice
1 (3 L/S, 1.5 T alt weeks)**

*Prerequisite(s) or Corequisite(s):
Completion of second-year Pharmacy,
registration in third-year Pharmacy;
PHARM 372.2, PHARM 200.1, PHARM
300.1; PHARM 400.1.*

An extension of PHARM 372.2, continuing the development of skills in drug literature evaluation and the application of research findings to patient care situations or the development of standards of care.

**PHARM 480.4
Structured Practical Experience III
2 (160 hours in 4 weeks in in Spring
and Summer Session after
completion of all other third year
requirements)**

*Prerequisite(s) or Corequisite(s):
Completion of second-year Pharmacy and
registration in third-year Pharmacy;
PHARM 280.1, PHARM 280.2,
PHARM 455.7, PHARM 456.7, PHARM 465.2, PHARM 418.2.*

A structured practice experience after completion of third year which will provide an opportunity for students to expand their technical, professional and patient care skills in a practice setting.

**PHARM 500.1 (First offered 2002-03)
Pharmacy Skills IV
1 (3T as scheduled)**

*Prerequisite(s) or Corequisite(s):
Completion of third-year Pharmacy,
registration in fourth-year Pharmacy;
PHARM 200.1, PHARM 300.1, PHARM
400.1; PHARM 557.6, PHARM 518.2,
PHARM 565.2, PHARM 580.16.*

This course will continue the development of necessary learning skills and those required to provide drug information to health professionals through additional experiences in the Drug Information Centre. Students will also complete a CPR course and an in-depth workshop to further their problem-solving skills in the area of drug information retrieval and provision.

**PHARM 518.2 (First offered 2002-03)
Issues in Pharmacy II
1 (3 L/S, 1.5T)**

*Prerequisite(s) or Corequisite(s):
Completion of third-year Pharmacy,
registration in fourth-year Pharmacy;
PHARM 417.4, PHARM 418.2; PHARM
500.1, PHARM 557.6, PHARM 565.2,
PHARM 580.16.*

A study of pharmacoepidemiologic and pharmaco-economic issues affecting health care and pharmacy practice.

**PHARM 557.6 (First offered 2002-03)
Pharmacotherapeutics III
1 (7.5L/S, 2P, 1.5T)**

*Prerequisite(s) or Corequisite(s):
Completion of third-year Pharmacy,
registration in fourth-year Pharmacy;
PHARM 455.7, PHARM 456.7; PHARM
500.1, PHARM 518.2, PHARM 565.2,
PHARM 580.16.*

The third of three courses discussing the clinical application of drug therapy in various disease states, including discussion of relevant principles of medicinal chemistry, applied pharmacokinetics, adverse effects or interactions, and toxicology.

**PHARM 565.2 (First offered 2002-03)
Patient Care III
1 (3L/S, 1.5 P or T alt weeks)**

*Prerequisite(s) or Corequisite(s):
Completion of third-year Pharmacy,
registration in fourth-year Pharmacy;
PHARM 365.5, PHARM 465.2, PHARM
455.7, PHARM 456.7; PHARM 557.6,*

*PHARM 518.2, PHARM 500.1, PHARM
580.16.*

The third of three Patient Care courses, this course involves the study of drug therapy considerations for specific patient populations such as the elderly, neonates, infants, children and pregnant women. New strategies for disease management (e.g., care plans, ambulatory care clinics) will also be covered.

**PHARM 580.16 (First offered 2002-03)
Structured Practical Experience IV
2 (16 weeks or 640 hours of
structured practical experiences)**

*Prerequisite(s) or Corequisite(s):
Completion of third year and all courses in
the first term of fourth year.*

Structured practice experiences will provide an opportunity for students to expand their technical, professional and patient care skills in practice settings, including both a community pharmacy and hospital. Students will also have the opportunity to select an additional practice site to gain further professional experience.

PHARMACY ELECTIVES

*Pharmacy electives are under review.
Students should check with the Dean's
office regarding electives for 2002-2003.*

**PHARM 415.3
Community Pharmacy Management
1(3L)**

A study of the problems which must be met in the successful operation of a community pharmacy practice including: selection of organizational structures, location, analysis, purchasing and financing a community pharmacy, risk management and insurance, inventory purchasing procedures and inventory management, pricing decisions, advertising, sales promotion and salesmanship, security and general business policies.

**PHARM 421.3
Forensic Toxicology
1(3L-3P)**

Deals with the analytical procedures involved in the detection of chemicals and drugs in body tissues and fluids and the identification of drugs of abuse. Appropriate instrumentation for analysis is discussed and employed in the practical component of the course.

**PHARM 439.3
Advanced Drug Analysis
2(3L-3P)**

Prerequisite(s): PHARM 330.
Makes use of instrumental methods for the analysis of drugs and pharmaceuticals. The lectures survey a classification of methods of instrumental analysis and briefly consider the theory involved and types of apparatus used. The laboratory work involves analytical procedures for representative drugs, and related dosage forms using a variety of instruments. Official quality control analysis of pharmaceuticals is emphasized.

PHARM 445.3

Applied Pharmaceutics: Design and Manufacturing of Dosage Forms 1(3L-3P)

A discussion of the processes used and the problems inherent in manufacturing of tablets, capsules, modified release dosage forms, liquids, emulsions, suspensions, semisolids, suppositories, aerosols, and sterile products. Laboratory exercises in which the student manufactures and tests these dosage forms are a major component.

PHARM 462.3

Hospital Pharmacy Practice 1(3L-3T)

Introduction to the role of the pharmacist as a member of the health care team in the provision of health services in the hospital. Emphasis will be placed on the elements of hospital pharmacy practice and the skills required to work as a pharmacist in the hospital setting. Students will have the opportunity to observe and practice various hospital pharmacy activities in a Saskatoon hospital.

PHARM 532.3

Drug Design 1(3L)

Prerequisite(s): PHARM 432 or the department's permission.

The principles of rational design of new compounds for pharmacological evaluation will be given with special reference to the postulated mode of action at the cellular level.

PHARM 533.3

Natural Products 1(3L)

Prerequisite(s): BIOCH 200 and 211 (203 or 205) or equivalent and PHARM 331.

An advanced study of medicinal compounds of natural origin. Precise topics vary from year to year. The preparation and presentation of papers is an essential course component. This is not a lecture course.

PHARM 591.3

Directed Studies: Thesis 1/2(6R) or 1&2(3R)

On the basis of library research, the student will prepare a 40-60 page thesis on a subject related to pharmacy. The subject is chosen in consultation with a faculty member who will also supervise preparation of the manuscript. The thesis will be graded by two faculty members.

Note: The student must obtain permission from the supervising faculty member before registering for the course.

PHARM 592.3

Directed Studies: Research 1/2(6P) or 1&2(3P)

The student will complete a research project under the supervision of a faculty member. A report to be submitted at the completion of the project, will be graded by two faculty members. The report should include a suitable literature review, a description of research methodology and a discussion of the results of the project.

Note: The student must obtain permission from the supervising faculty member before registering for the course.

GRADUATE COURSES

College of Graduate Studies & Research

**PHARM 831.3
Natural Products 1/2(3S)**

Prerequisite(s): BIOCH 211 (or 203) and the instructor's permission.

Advanced study of medicinal compounds of natural origin, including antibiotics, alkaloids, glycosides, and steroids. The preparation and presentation of papers is required.

**PHARM 832.3
Drug Design 1(3L)**

Prerequisite(s): the instructor's permission

Consideration is given to the way in which new drugs are developed and the importance of drug latention is stressed. Some of the chemical, physicochemical and biochemical parameters affecting bioactivity are outlined.

**PHARM 847.3
Specialized Topics in Pharmaceutics 1/2(3L/P)**

An advanced course involving the principles in product development.

**PHARM 848.3
Advanced Biopharmaceutics and Pharmacokinetics 1/2(3L)**

Selected topics in biopharmaceutics and pharmacokinetics: qualitative and quantitative aspects of drug absorption, distribution and elimination.

**PHARM 854.3
Metabolic Transformations of Xenobiotics 1/2(3L)**

An advanced study of the basic principles of the metabolism of foreign compounds in mammals. The xenobiotics covered will include drugs, food additives, agricultural chemicals and industrial chemicals. The detoxification and toxicological implications of metabolism are emphasized.

**PHARM 856.3
Forensic Toxicology 1(3L-4P)**

Deals with the analytical procedures involved in the detection of chemicals and drugs in the body tissues and fluids, and the identification of drugs of abuse. Appropriate analytical chemical techniques are discussed and used during the practical component of the course.

**PHARM 857.3
Advanced Pharmacotherapy I 1/2(S)**

Prerequisite(s): Undergraduate courses in pharmacotherapeutics; and the instructor's permission..

A detailed drug therapy course designed to prepare the student for the advanced clinical clerkship. Pathophysiology, clinical presentation, laboratory and clinical monitoring, monitoring and therapeutic regimens, both current and investigational, will be discussed. Topics include cardiovascular and pulmonary disorders, infectious disease and diabetes.

PHARM 858.3

Advanced Pharmacotherapy II

Prerequisite(s): Undergraduate courses in pharmacotherapeutics; and the instructor's permission.

A detailed drug therapy course designed to prepare the student for the advanced clinical clerkship. Pathophysiology, clinical presentation, laboratory and clinical monitoring, monitoring and therapeutic regimens, both current and investigational, will be discussed. Topics include psychiatric, neurologic and renal disorders, hematology and rheumatology.

**PHARM 862.3
Advanced Clinical Pharmacy I 1/2(2L-12C)**

Prerequisite(s): Completion of a degree in Pharmacy or equivalent; and the instructor's permission.

Advanced course in clinical pharmacy designed to enhance the student's practical knowledge of drug therapy and to attain skills in interprofessional and patient communications. Practical experience in an ambulatory and institutional health care environment will be featured.

**PHARM 863.3
Advanced Clinical Pharmacy II 1/2(2L-12C)**

Prerequisite(s): PHARM 862; or permission of the instructor.

Continuation of PHARM 862, with focus on more advanced experiences in drug monitoring. Practical experience in the ambulatory and institutional health care environment will be a featured part of this course.

**PHARM 898.3/899.6
Special Topics**

**PHARM 990
Seminar**

Papers and discussion on recent developments in pharmaceutical fields. Graduate students are required to attend and to take part in the seminars.

**PHARM 994
Research**

Students writing a Master's thesis must register for this course.

**PHARM 996
Research**

Students writing a Ph.D. thesis must register for this course.

PHILOSOPHY

Department of Philosophy, College of Arts & Science

**PHIL 110.6
Introduction to Philosophy 1&2(3L)**

An introduction to the perennial issues in Western philosophy which arise out of the search for truth and meaning in life: good and evil, appearance and reality, the rational grounds for belief in God, scepticism and knowledge, social justice. Emphasizes critical thinking and the development of understanding through reasoned argument.

Note: No previous training in philosophy is required or presupposed. Students with credit for PHIL 120 or 133 may not take this course for credit. (Students with credit for PHIL 120 or PHIL 133 should take the remaining one if they are seeking equivalency to PHIL 110.)

**PHIL 120.3
Knowledge, Mind, and Existence: Introductory Topics in Philosophical Problems 1/2(3L)**

Introduces students to philosophy by exploring fundamental problems about reality, the limits of human knowledge, and the nature of the mind. Topics include whether we have free will, whether there are grounds for doubt about the basic beliefs about other people or the world, and the nature and role of cognition in the composition of a human being.

Note: Students with credit for PHIL 110 may not take this course for credit.

**PHIL 133.3
Introduction to Ethics and Values 1/2(3L)**

Introduces students to theories of the nature and justification of ethical concepts and decision procedures. Issues include the relation of motivation to moral justification, whether morality is subjective, relative or absolute, whether moral knowledge is possible, the relation between morality and legality, and the relation of morality to religion.

Note: Students with credit for PHIL 110 may not take this course for credit.

**PHIL 140.3
Critical Thinking 1/2(3L)**

An introduction to essential principles of reasoning and critical thinking, designed to introduce the students to the analysis of concepts, to enhance their ability to evaluate various forms of reasoning and to examine critically beliefs, conventions and theories, and to develop sound arguments. Topics include fundamentals of logic and analysis, definition, logical fallacies, and conceptual analysis.

Note: Students with credit for MPHIL 105, 293, or PHIL 105, 240, 241, 242, 243 or CMPT 260 may not take this course for credit. To receive credit for both PHIL 140 and CMPT 260, students must take PHIL 140 prior to CMPT 260. Students may not take PHIL 140 concurrently with PHIL 240 or PHIL 241 or PHIL 243 or CMPT 260.

**PHIL 202.3
Introduction to the Philosophy of Religion 1/2(3L)**

Prerequisite(s): 6 credit units in philosophy or completion of 24 credit units at the university.

The concept of religion; different theories explaining the origin of religion; the philosophical conception of religion in contrast to mythology, ideology, magic, superstition and theology; God: mystery or problem; different ways to approach the mystery of God, the meaning of religious terms and language, varieties of atheism and unbelief; the problem of evil. *Note:* Students with credit in MPHIL 202 may not take this course for credit.

COURSES • *Philosophy*

PHIL 203.3 **Contemporary Philosophy of Religion** 1/2(3L)

Prerequisite(s): 6 credit units in philosophy or completion of 24 credit units at the university.

The impact of Existentialism, Structuralism, Transcendentalism and Linguistic Analysis on contemporary religious thinking; dialogue between Marxism and religion; "Christian Atheism" and the "Death of God" movement, the necessity of "demythologization" and "re-mythologization" in religious experience and language; the problem of evil.

PHIL 204.3 **Philosophy of Religion: The Christian Philosophical Tradition** 1/2(3L)

Prerequisite(s): 6 credit units in philosophy or completion of 24 credit units at the university.

An introduction to major constructive thinkers of the Christian tradition. Clarifies the differences between Christian philosophy, theology and philosophy of religion by explaining how distinctively philosophical questions arise out of the context of Christian belief and practice. Thinkers to be studied will range from the patristic period to the 20th century.

PHIL 208.3 **Ancient Philosophy: The Presocratics to Plato** 1/2(3L)

Prerequisite(s): 6 credit units in philosophy or completion of 24 credit units at the university.

A study of the origins of philosophical reasoning in ancient Greece to its most extensive development in the philosophy of Plato. Classical views of the ultimate nature of reality, the scope and limits of human knowledge, and the grounds for aesthetic and moral evaluations will be examined.

PHIL 209.3 **Ancient Philosophy: Aristotle to Plotinus** 1/2(3L)

Prerequisite(s): 6 credit units in philosophy or completion of 24 credits at the university.

The development of philosophy in ancient Greece and Rome from the time of Aristotle to the emergence of Christianity. In addition to a survey of several of the most important aspects of Aristotle's philosophy, this course will examine such schools of thought as Stoicism, Epicureanism, and Neoplatonism.

PHIL 210.3 **Medieval Philosophy I** 1(3L)

Prerequisite(s): 6 credit units in philosophy.

The study of major thinkers of the early middle ages, including Augustine, Boethius, Eriugena, Anselm, and Abelard. Background will be provided to Neoplatonic themes that shape this period. Topics include free will, happiness, the existence of God, theories of truth, and the problem of universals.

Note: Students with credit in MPHIL 297 may not take this course for credit.

PHIL 211.3 **Medieval Philosophy II** 2(3L)

Prerequisite(s): 6 credit units in philosophy.

The study of major Jewish, Muslim, and Christian thinkers of the high middle ages, including Moses Maimonides, Avicenna, Averroes, Bonaventure, Thomas Aquinas, Duns Scotus, and William of Ockham. Background to Aristotle and his tradition will be provided. Topics include the relation of faith and reason, existence and nature of God, human nature, voluntarism, and the critique of metaphysics.

Note: Students with credit in MPHIL 298 may not take this course for credit.

PHIL 213.3 **Origins of Modern Philosophy – The Rationalists** 1/2(3L)

Prerequisite(s): 6 credit units in philosophy.

A study of 17th-century Continental Rationalism. The writings of such figures as Descartes, Malebranche, Spinoza and Leibniz will be examined.

PHIL 214.3 **Origins of Modern Philosophy - The Empiricists** 1/2(3L)

Prerequisite(s): 6 credit units in philosophy.

A study of the development of British Empiricism in the 17th and 18th centuries. The writings of such figures as Locke, Berkeley and Hume will be examined.

PHIL 215.3 **19th-Century Idealism and the Existential Revolt** 1/2(3L)

Prerequisite(s): 6 credit units in philosophy.

A study of the major 19th-century thinkers concentrating on the development of, and reactions to, idealism and the origins of contemporary existentialism. Readings in representative figures such as Hegel, Schopenhauer, Marx, Kierkegaard, and Nietzsche.

Note: Students with credit in MPHIL 218 may not take this course for credit.

PHIL 219.3 **Human Destiny in Contemporary Continental Philosophy** 2(3L)

Prerequisite(s): 6 credit units in philosophy. Investigates current continental European trends in philosophy. The focal point will be "Human Destiny". The philosophers studied from year to year will be selected from such thinkers as: Scheler, Heidegger, Sartre, Marcel, Camus, Teilhard de Chardin, Maritain, Ricoeur, Levi-Strauss, Lonergan, Bloch.

Note: Students with credit in MPHIL 219 may not take this course for credit.

PHIL 224.3 **Philosophy of Sexuality** 1/2(3L)

Prerequisite(s): 6 credit units in philosophy or completion of 24 credit units at the university.

A philosophical examination of the fundamental assumptions about the nature

of sexuality. Philosophical theories about "natural" or "proper" male and female roles, mental and physical sexual distinctions and the sexual aspects of rationality and emotion will be examined along with their implications for such topics as work, marriage, love, friendship, communication, and politics.

PHIL 225.6 **Death in Western Thought** 1&2(3L)

Prerequisite(s): 6 credit units in philosophy or completion of 24 credit units at the university.

An examination of western thinkers' reflections on death: the pre-Socratics, Plato, Augustine, Aquinas, Descartes, Kant, Hegel, Freud and Heidegger.

Note: Students with credit in MPHIL 222 may not take this course for credit.

PHIL 226.3 **Environmental Philosophy** 1/2(3L)

Prerequisite(s): PHIL 110, or 120 and 133, or completion of 24 credit units at the university.

A philosophical study of moral, social and political issues concerning the environment, whether natural or constructed. Topics may include: the nature of Nature, nonanthropocentric ethics, animal rights, political and cultural roots of environmental abuse, evolutionary perspectives, the Gaian hypothesis, ecotopias, environmental aesthetics, the place of environment in the Good Life.

PHIL 227.3 **An Introduction to Feminist Philosophy** 1/2(3L)

Prerequisite(s): 6 credit units in philosophy or completion of 24 credit units at the university.

Examines ways feminist philosophers have critiqued traditional western philosophy. Looks at feminist criticism of major positions in recent philosophy as well as the rich variety of constructive responses to these critiques. Introduces students to a number of feminist positions.

PHIL 230.3 **Introduction to General Ethics** 1/2(3L)

Prerequisite(s): 6 credit units in philosophy or completion of 24 credit units at the university.

Ethical anthropology and theories of moral values; freedom and determinism, law and conscience, present ethical thinking about human fulfillment and personalism; the relationship between religion and morality, the sources of morality.

Note: Students with credit in MPHIL 290 may not take this course for credit.

PHIL 231.3 **Ethical Problems** 1/2(3L)

Prerequisite(s): 6 credit units in philosophy or completion of 24 credit units at the university.

Contemporary ethical problems such as the morality of human sexuality, abortion, euthanasia, manipulation of human beings,

war and revolution, environmental ethics, prejudice and discrimination.

Note: Students with credit in MPHIL 291 may not take this course for credit.

PHIL 233.3 **Ethical Theory** 1/2(3L)

Prerequisite(s): 6 credit units in philosophy or completion of 24 credit units at the university.

An examination of the presuppositions underlying moral reasoning and action. Topics will include nihilism, relativism, emotivism, utilitarianism, deontological theories and the status of human rights. Representative classical and contemporary theories about the nature and status of morality will be considered.

PHIL 234.3 **Biomedical Ethics** 1/2(3L)

Prerequisite(s): PHIL 110, or 120 and 133, or completion of 24 credit units at the university.

An examination of contemporary biomedical ethical issues such as the definition of a person, determination of life and death, euthanasia, abortion, prenatal diagnosis and intervention, problems in the physician-patient relationship, reproductive technologies, genetic engineering and accessibility to health care.

Note: Students with credit in MPHIL 292 may not take this course for credit.

PHIL 235.3 **Ethical Issues in Business and Professions** 1/2(3L)

Prerequisite(s): PHIL 110, or 120 and 133, or completion of 24 credit units at the university.

Introduces ethical issues that are related to business enterprises and professional practices such as the questions of striking and advertising; preferential hiring; responsibility to society; the organization and the profession. It will also consider theoretical questions about free enterprise, socialist politics, and government controls and regulations.

PHIL 236.3 **Ethics and Technology** 3L

Prerequisite(s): 6 credit units in philosophy or completion of 24 credit units at the university.

An overview of ethical issues related to the impact of modern technology on scientific research and the activities of corporations and professionals. Topics include: moral responsibility in the age of technology, genetic engineering of plants and animals, environmental ethics, privacy in the computer age, and ethical issues in international markets.

PHIL 240.3 **Aristotelian Logic** 1(3L)

Prerequisite(s): 6 credit units in philosophy or completion of 24 credit units at the university.

The meaning of concept, term, judgement and proposition, categorical and hypothetical reasoning and induction;

mathematical logic (Venn diagrams, truth trees, elementary deductions, syllogism). Frequent exercises will be assigned.

Note: Students with credit in MPHIL 293 may not take this course for credit.

PHIL 241.3
Introduction to Symbolic Logic I
1/2(3L)

Prerequisite(s): 6 credit units in philosophy or completion of 24 credit units at the university.

An introduction to modern logic. Truth-functional statement logic and first order predicate logic. Formalization of natural language statements and arguments.

Note: Students may not count both PHIL 241 and CMPT 260 as part of their major or honours in philosophy. Students with credit for PHIL 242 may not take this course for credit.

PHIL 243.3
Introduction to Symbolic Logic II
1/2(3L)

Prerequisite(s): PHIL 241 or CMPT 260.

Review of sentential logic. First order predicate logic with relations, identity, and definite descriptions. Formalization of natural language statements and arguments. Introduction to modal logic.

Note: Students with credit for PHIL 242 may not take this course for credit.

PHIL 251.3
Philosophy of Science
1/2(3L)

Prerequisite(s): 6 credit units in philosophy or 12 credit units in a natural science.

An introduction to the nature, extent and significance of scientific knowledge. Problems about the nature of scientific theories and models, scientific explanation and prediction, scientific growth, and issues about the relationship between science, religion and morality will be discussed.

PHIL 262.3
Social and Political Philosophy
1/2(3L)

Prerequisite(s): 6 credit units in philosophy, history or a social science.

An examination of philosophical theories of political organization. Such issues as justice and power, rights, freedom and the public good will be discussed.

PHIL 271.3
Aesthetics
1/2(3L)

Prerequisite(s): 6 credit units in philosophy, fine arts or literature.

An introduction to philosophical problems related to the arts; such as the nature of art, meaning, expression, and the nature of critical and evaluative judgments.

PHIL 281.3
Theory of Knowledge
1/2(3L)

Prerequisite(s): 6 credit units in philosophy.

Examines the status and extent of our knowledge of the world, of ourselves, and other people. Problems about the nature of knowledge, the justification of claims of knowledge, the relationship of knowledge

to belief and truth, perception, and the viability of scepticism will be discussed.

Note: Students with credit in PHIL 221 may not take this course for credit.

PHIL 292.3
Introduction to Metaphysics
1/2(3L)

Prerequisite(s): 6 credit units in philosophy.

Surveys the principal types of theories of reality that have been produced in western philosophy, e.g., materialism, idealism, dualism, monism, atomism, and investigates major problems and concepts in metaphysics, e.g., time, space, substance, essence, free will and determinism, causality, the nature of the self and the problem of universals.

Note: Students with credit in PHIL 222 may not take this course for credit.

PHIL 294.3
Philosophy of Human Nature
2(3L)

Prerequisite(s): 6 credit units in philosophy or completion of 24 credit units at the university.

An introductory survey of major philosophic conceptions of human nature, its principles and operations. Such thinkers as Plato, Aristotle, Thomas Aquinas, Hegel, Schopenhauer, Marx, Nietzsche, Freud, and contemporary sociobiologists will be considered.

Note: Students with credit in MPHIL 294 or PHIL 229 may not take this course for credit.

PHIL 296.3
The Nature of Material Reality
1/2(3L)

Prerequisite(s): 6 credit units in philosophy or 12 credit units in natural science.

A study of the philosophy of nature which examines ancient and modern views on the material constitution of bodies, organisms, and persons. Major topics include the nature of substance, the distinction between properties and substances, artifacts and natural things, and the mind-body problems.

Note: Students with credit in MPHIL 296 may not take this course for credit.

PHIL 312.3
Great Philosophers: Historical Figures
1/2(3S)

Prerequisite(s): 12 credit units in philosophy.

Detailed reading in the work of a major philosopher such as Aristotle, Hume or Russell.

PHIL 313.3
Great Philosophers: Contemporary Figures
1/2(3S)

Prerequisite(s): 12 credit units in philosophy. Consists of detailed reading in the work of some major philosopher.

PHIL 314.3
Kant
1/2(3L)

Prerequisite(s): 12 credit units in philosophy. A study of Kant's Critical Philosophy, with emphasis on the Critique of Pure Reason.

PHIL 317.3
Analytic Philosophy
1/2(3L)

Prerequisite(s): PHIL 241 or CMPT 260 and 9 credit units in philosophy.

Traces the development of analytic tradition from the realism of Russell and Moore through logical positivism and linguistic analysis to subsequent contemporary approaches in analytic philosophy.

Note: Students with credit in PHIL 217 may not take this course for credit.

PHIL 319.3
Studies in 20th-Century Continental Philosophy
1/2(3L)

Prerequisite(s): 12 credit units in philosophy.

Contemporary continental philosophy focusing on phenomenology, existentialism and existential phenomenology. Consideration will be given to such figures as Husserl, Heidegger, Sartre, Merleau-Ponty, Ricoeur, and Gadamer.

Note: Students with credit for PHIL 216 may not take this course for credit.

PHIL 320.3
Studies in Philosophy
1/2(3S)

Prerequisite(s): 12 credit units in philosophy.

The topic, movement or philosophers studied will vary from year to year.

PHIL 326.3
Philosophy of Mind
1/2(3S)

Prerequisite(s): 12 credit units in philosophy, or PHIL 110, or 120 and 133, and 12 credit units in psychology.

An examination of major philosophic theories of the human mind. The traditional dualistic theory that the mind and body are distinctly different will be contrasted with contemporary logical behaviourism and with the modern materialist's theory that the mental can be explained in terms of brain states and brain functions.

PHIL 333.3
Ethical Studies
1/2(3L)

Prerequisite(s): 12 credit units in philosophy including one of 231, 233, 234 or 235.

Concerned with topics such as the cognitive status of judgements about what is right and good, about the grounds of ethical judgement and the logic of ethical argument, and about the role of rules and principles in ethical dispute.

PHIL 343.3
Philosophical Logic
1/2(3L)

Prerequisite(s): PHIL 241 or CMPT 260 and 9 credit units in philosophy.

An introduction to basic topics in philosophical logic such as propositions and the problem of abstract entities, necessity, analyticity and the a priori, theories of truth, theories of meaning and reference, existential commitment and presupposition, essentialism, entailment.

PHIL 362.3
Topics in Political Philosophy
1/2(3S)

Prerequisite(s): PHIL 262 or POLST 235.

The topic, political philosopher, movement or theories studied will vary from year to year.

PHIL 381.3
Topics in Metaphysics and Epistemology
1/2(3S)

Prerequisite(s): 12 credit units in philosophy.

Metaphysical theories and problems, and the nature of metaphysics. Perception, belief and knowledge.

Note: Students with credit for PHIL 344 may not take this course for credit.

PHIL 396.6
Metaphysics
1&2(3L)

Prerequisite(s): 12 credit units in philosophy.

Study of philosophical attempts to achieve knowledge of reality beyond the empirical; approached historically in terms of ancient, medieval, modern and contemporary theory; and problematically-in terms of present day concerns, such as space, time, motion, nature, existence, essence, God, soul, mind, idea, freedom, person, death, anxiety and art.

Note: Students with credit in MPHIL 396 may not take this course for credit.

PHIL 404.3
Advanced Problems in Philosophy and Theology
1(3L)

Prerequisite(s): 12 credit units in philosophy.

Philosophical aspects of contemporary psychological and theological problems treated at an advanced level. Selected readings in Freud, Jung, Ryle, Merleau-Ponty, Marcel, Ricoeur and others.

PHIL 410.6
Philosophical Method
1&2(3S)

Prerequisite(s): 18 credit units in philosophy, or 12 credit units in philosophy and 6 credit units in historical method or scientific method in another discipline.

The historical development and application of method in Greek and Medieval thought (elenchus, axiomatic method, etc.); Kantian background for contemporary methodological theories; dialectical hypothetico-deductive, and analogical models; the methods of philosophy as identical to or distinct from those of science.

PHIL 412.3
Philosophy of Thomas Aquinas I
1/2(3S)

Prerequisite(s): 18 credit units in philosophy.

The philosophy of Aquinas considered in the areas of philosophical theology, metaphysics, and philosophy of nature.

Note: Students with credit for PHIL 411 may not take this course for credit.

COURSES • *Philosophy*

PHIL 413.3 **Philosophy of Thomas Aquinas 2** **1/2(3S)**

Prerequisite(s): 18 credit units in philosophy.

The philosophy of Aquinas considered in the areas of human nature, epistemology, and ethics.

Note: Students with credit for PHIL 411 may not take this course for credit.

PHIL 418.3 **20th-Century Analytic Philosophy** **1/2(3S)**

Prerequisite(s): PHIL 241 or CMPT 260 and 9 credit units in philosophy.

Studies developments in analytic philosophy since World War II, examining representative works of the period including those of such philosophers as Wittgenstein, Ryle, Austin, Ayer, Quine, Davidson, Nagel, Strawson, Dummett, Putnam, Kripke and Rorty.

PHIL 420.3 **Honours Seminar** **1/2(2S)**

Prerequisite(s): 18 credit units in philosophy and acceptance into the Honours program, or high standing and permission of department.

An advanced seminar in contemporary philosophy primarily for honours students. Focuses on a recent important book or a set of related journal articles on a central philosophical subject. Emphasis will be on student presentations and discussion.

PHIL 446.3 **Philosophy of Language** **1/2(3S)**

Prerequisite(s): PHIL 241 or CMPT 260 and 9 credit units in philosophy.

An introduction to philosophical problems about language and linguistic approaches to philosophy. How language represents reality; how language colours our thoughts about reality; language as a vehicle of communication. Traditional accounts of truth, meaning, reference, predication and expression will be discussed, as well as methodology in language study and linguistic philosophy.

PHIL 455.3 **Philosophy of Social Science** **1/2(3S)**

Prerequisite(s): PHIL 251 or 12 credit units in philosophy or 6 credit units in philosophy and 12 credit units in a social science or history.

Examines current conceptual, ontological, epistemological, and methodological issues in philosophy of social science; generalization and prediction in the social sciences, reasons vs. causes, interpretation and meaning of social phenomena, intentionality, explanation of action, reductionism, supervenience, individualism vs. holism, objectivity, realism, constructivism, relativism, facts vs. values, feminism, postmodernism, sociology of knowledge.

PHIL 481.3 **Topics in Metaphysics and** **Epistemology** **1/2(3S)**

Prerequisite(s): 12 credit units in philosophy.

A second course in metaphysics and epistemology. Topics not considered in PHIL 381 will be discussed, topics such as personal identity, universals, scepticism, substance, properties and relations, and necessity and possibility.

Note: Students with credit for PHIL 345 may not take this course for credit.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

PHIL 298.3 1/2(3S)
PHIL 299.6 1&2(3S)
PHIL 398.3 1/2(3S)
PHIL 399.6 1&2(3S)
PHIL 498.3 1/2(3S)
PHIL 499.6 1&2(3S)

GRADUATE COURSES

Department of Philosophy, College of Graduate Studies & Research

PHIL 808.3 Topics in Greek and Roman Philosophy 1/2(3S)

PHIL 813.3 Topics in 17th- and 18th-Century Philosophy 1/2(3S)

PHIL 814.3 Kant 1/2(3S)

PHIL 815.3 Topics in 19th-Century Philosophy 1/2(3S)

PHIL 816.3 Topics in Contemporary European Philosophy 1/2(3S)

PHIL 817.3 Topics in Contemporary Analytic Philosophy 1/2(3S)

PHIL 818.3 Topics in Contemporary American Pragmatism 1/2(3S)

PHIL 819.3 Wittgenstein 1/2(3S)

PHIL 820.3 Philosophical Texts 1/2(3S)

PHIL 826.3 Seminar in Philosophy of Mind 1/2(3S)

PHIL 833.3 Seminar in Ethics 1/2(3S)

PHIL 842.3 Topics in Philosophical Logic 1/2(3S)

PHIL 844.3 Seminar in Epistemology 1/2(3S)

PHIL 845.3 Seminar in Metaphysics 1/2(3S)

PHIL 846.3 Seminar in the Philosophy of Language 1/2(3S)

PHIL 851.3 Seminar in the Philosophy of Science 1/2(3S)

PHIL 862.3 Seminar in Social and Political Philosophy 1/2(3S)

PHIL 871.3 Seminar in Aesthetics 1/2(3S)

PHIL 990 **Seminar**

This seminar meets every two weeks throughout both terms of the regular academic year. Under the direction of a faculty member of the department, graduate students study current literature on selected topics and also present papers on their

research projects. All graduate students in Philosophy are required to attend this seminar throughout their program and are expected to present at least one paper to the seminar every year.

PHIL 994 **Research**

All Masters' students must register in this course.

PHYSICAL THERAPY

School of Physical Therapy

Students who have not been accepted into the School of Physical Therapy require approval from the course instructor to register in any of the following courses.

P TH 205.3 **Cardio-Respiratory System I** **2(4L-1.5P)**

Study of the etiology, pathophysiology, clinical features, medical, surgical and physical management of various cardiovascular and respiratory conditions is commenced in this course. Emphasis is on understanding and application of the assessment process and basic treatment approaches. A lecture/ laboratory/case-study/computer-assisted learning format is employed.

P TH 222.3 **Therapeutic Movement I** **1(3L-2P)**

Theory and application of therapeutic positioning and movement; exercise prescription; equipment prescription and use.

P TH 223.3 **Therapeutic Movement II** **2(3L-2P)**

Theory and application of therapeutic positioning, therapeutic movement, re-education of basic motor skills and neuromuscular facilitation are studied in lectures and laboratories.

P TH 225.3 **Foundations of Exercise and Work Physiology for Physical Therapists** **1(2.5L-.5P)**

An introduction to exercise/work physiology for physical therapists. The course will examine the physiological foundations from which activity/exercise assessment, and treatment are derived. Labs and tutorials will focus on examination of the physiological responses to physical activity with discussion of altered responses in clinical populations and changes in techniques and approach required for monitoring and evaluating those clinical populations.

P TH 236.3 **Clinical Kinesiology I** **2(3L-2P-1T)**

A lecture and laboratory course which examines the theory underlying therapeutic and assessment methods by the application of the principles of biomechanics and functional anatomy. Also included is a detailed study of surface anatomy.

P TH 240.3 **Electro-Physical Agents in Physical Therapy I** **1/2(2L-1.5P)**

The physical principles, physiological effects and therapeutic uses of various heating, cooling and mechanical modalities, are covered in this theoretical and practical course. A mastery learning approach is taken to enable students to develop competence in the use of hot and cold treatments, wax, infrared, diathermy and therapeutic ultrasound.

P TH 264.3 **Introduction to Physical Assessment and Treatment Planning** **1(3L-.5C-.5T)**

A lecture, tutorial and case study course with clinical facility visits, introducing the basic framework for physical therapy assessment, program planning, and treatment. A general approach to client assessment and determination of treatment plans will consider all body systems, and will integrate subjective and objective evaluation, differential diagnosis, holistic goal setting, discharge planning, and outcome measurement. Documentation formats common to physical therapy settings will be reviewed, and emphasis placed on medico-legal requirements of client record-keeping, use of standardized World Health Organization terminology.

P TH 276.6 **Clinical Applications of Basic Skills** **3(37.5C)**

Consists of a five week, full-time period of clinical education in the spring following the first year. Placements are in Saskatchewan centres.

P TH 283.3 **Physical Therapist as Health Educator** **1(3L)**

A theoretical and practical course in the principles of learning and instruction which can be applied in clinical treatment, the design, implementation and evaluation of patient education programs, instruction of relatives or other health care personnel on patient management and in clinical teaching and supervision of students.

Note: Students with credit for P TH 482 may not take this course for credit.

P TH 301.3 **Musculo-Skeletal Assessment and Treatment I** **1(2L-4P)**

A lecture and laboratory course in the biomechanical assessment and treatment of the upper quadrant. Includes subjective assessment, objective assessment scans, contractile and inert tissue differentiation, capsular and non capsular patterns, principles of manual therapy for treating pain and stiffness, indications and contraindications of treatment.

P TH 302.3 **Musculo-Skeletal Assessment and Treatment II** **2(2L-4P)**

A lecture and laboratory course in the biomechanical assessment and treatment of the lower quadrant. A continuation of P TH 301, and will cover similar assessment

procedures, and principles of treatment as appropriate for the lower quadrant.

**P TH 303.3
Nervous System I
1(5L-1.5P)**

Normal motor control, motor learning theory, and abnormalities of movement resulting from lesions of the nervous system are studied as a basis for developing appropriate physical therapy assessment and treatment methods. Application of these methods to the management of adult hemiplegia completes course content.

**P TH 304.3
Nervous System II
2(4.5L-1.5P)**

Continues the study of the physical therapy assessment and treatment methods for neurological conditions including adult hemiplegia, brain injury, spinal cord injury, Parkinson's disease, multiple sclerosis, post-polio syndrome, and amyotrophic lateral sclerosis.

**P TH 306.3
Cardio-Respiratory System II
1(4L-.75T-.75P)**

Study of diseases affecting the respiratory and cardiovascular systems is continued in lecture/ laboratory/self-study format.

**P TH 308.3
Lifespan, Nutrition and
Pharmacology: Considerations in
Physical Therapy
1/2(4L)**

Covers theory and clinical management related to physical therapy assessment and treatment through the lifespan. Various health professionals will present topics including, growth and development, women's health issues, gerontology, pain, pharmacology and nutrition.

**P TH 311.3
Musculo-Skeletal System I
1/2(4.5L-.5T)**

The etiology, pathology, bone and soft tissue healing, medical, surgical and physical therapy management of trauma, repetitive strain injury and other conditions affecting the musculo-skeletal system, including: fractures; dislocations and subluxations, mechanical derangements, peripheral nerve injuries, burns and frostbite, and lesions in soft tissues, are presented in lectures and case study.

**P TH 312.3
Musculo-Skeletal System II
1/2(4.5L-.5P)**

The epidemiology, etiology, pathology, and clinical features of common rheumatic diseases and amputations are presented. Management of these disorders includes assessment, medication, surgery, and therapeutic intervention.

**P TH 337.3
Clinical Kinesiology II
1(3L-2P-1T)**

A continuation of P TH 236. Examines the body regionally with respect to biomechanics, common pathomechanics, and physical therapy methods of measurement. Analysis of movement with special attention to gait. Continues the detailed study of surface anatomy.

**P TH 341.3
Electro-Physical Agents in Physical
Therapy II
1/2(2L-3P)**

The physical principles, physiological effects and therapeutic uses of diagnostic and therapeutic electrical stimulation and various forms of phototherapy, are covered in this theoretical and practical course. A mastery learning approach is taken to enable students to develop competence in electro-diagnostic testing, the use of various electrotherapeutic currents, ultraviolet light and laser biomodulation.

**P TH 367.3
Clinical Assessment
2(2L-1C-1T)**

Combines lectures and tutorials, providing opportunity for application of assessment theory and skills in a variety of clinical settings. Tutorials analyze the assessment experience and data. Lectures prepare the student for full-time clinical practicums.

**P TH 378.12
Clinical Practicum I
3(37.5C)**

A ten-week, (normally 2 x 5 weeks), full-time period of clinical education following the second term of second year. The last five weeks may be completed in an out-of-province placement, part of the out-of-province experience required from this course or P TH 462.

**P TH 403.3
Research Methodology
1(4L)**

The primary emphasis of this class will be on theoretical discussion and practical activities which contribute to the development of research skills applicable to evidence-based practice of physical therapy. Using research reports pertaining to physical therapy found in the medical literature, students will apply research theory to classify research design, identify design elements, apply methodological analysis tools, evaluate internal and external validity of research and determine the implications for clinical practice.

**P TH 421.3
Exercise Testing and Prescription for
Special Populations
1(4.5L-.5P-.5T)**

The pathophysiologic and theoretical basis of exercise testing and prescription for rehabilitation programs for various conditions are studied.

**P TH 439.3
Orthopedic and Sports Physical
Therapy: Therapeutic Exercise,
Manual Therapy, Integrated
Management
1(3L-2P)**

Covers the assessment and treatment of common musculoskeletal conditions and sport related injuries, including manual therapy techniques and selected manipulation techniques. Advanced therapeutic exercise prescription, functional screening evaluation, goal setting and outcome measurement in the musculoskeletal area will also be emphasized. Course content will be covered in lecture and practical sessions.

**P TH 440.3
Advanced Neurological and
Cardiorespiratory Systems
1(3L-1.5P)**

A final year course including neurological and cardiorespiratory topics for physical therapists. The neurological component includes study of normal sensori-motor development during the first 18 months of life, assessment and treatment of cerebral palsy, and assessment and treatment of other selected neurological conditions. The cardiorespiratory component will focus on the assessment and management of cardiorespiratory sequelae of common progressive neuromuscular conditions, high level spinal cord injuries, and selected restrictive lung disorders. Issues, approaches, outcome measures and resources inherent to ICU, community-based and direct access physical therapy clinic settings will be discussed.

**P TH 462.15
Clinical Practicum II
2(37.5C)**

Consists of a 16 week, (normally 2 x 5 weeks, 1 x 6 weeks), full-time period of clinical education in the second term of the final year. Normally, two rotations are spent in Saskatchewan, and one rotation in out-of-province centres.

**P TH 490.3
Professional Issues
1(2L-2S)**

Study of the legal, ethical, social and economic factors which affect the role of the physical therapist and the principles of departmental organization and management.

PHYSICS

Department of Physics and Engineering Physics, College of Arts & Science

**PHYS 111.6
General Physics
1&2(3L-2.5P-1T)**

Prerequisite(s): Mathematics B30 and C30 (or, under the old mathematics curriculum, Algebra 30 and Geometry-Trigonometry 30); Physics 30.

Emphasizes the basic principles of Physics and their applications to the various scientific fields. Also gives the students an insight into the benefits and problems of technology. Topics are mechanics, wave motion and sound, heat, electricity and magnetism, light and modern physics.

Note: Students with credit for PHYS 121 may not take this course for credit.

**PHYS 121.6
General Physics
1&2(3L-3P)**

Prerequisite(s): MATH 110, and 116 or 112 (may be taken concurrently); Physics 30.

A calculus based one year survey course in physics. Topics include: mechanics, waves and optics, electricity and magnetism, quantum physics and special relativity.

Note: PHYS 121 is for students planning to take an honours program in physics, chemistry, geophysics or mathematics and for students intending to major in physics or who plan on taking further

physics courses. Students with credit for PHYS 111 may not take this course for credit.

**PHYS 128.3
Contemporary Physics
2(3L/1.5P)**

Prerequisite(s): Physics 30; MATH 110.

Introduces students to recent discoveries in physics. As well as the traditional topics of "Modern Physics", Relativity and Quantum Theory, students will learn about recent developments in Nuclear, Atomic, Molecular and Particle Physics as well as Solid State Physics and Optics.

Note: Students may receive credit for both PHYS 128 and for PHYS 111 or 121. Physics majors may receive physics credit for PHYS 128. PHYS 128 may be used toward the natural science requirement in the B.Sc. and B.A. degree programs. Only 6 credit units in a subject may be used for distribution in Requirement 1 in Program Type C.

**PHYS 216.3
Waves, Optics and Quantum Physics
2(3L-3P)**

Prerequisite(s): MATH 110 and 116; PHYS 121 or 111.

Properties common to all waves are studied and particular attention is paid to geometrical and wave optical phenomena. The basic principles of optics are applied to optical instruments. In the latter part of the course Quantum physics is introduced. Lectures are complemented by laboratory and regular problem assignments.

**PHYS 223.3
Mechanics I
2(3L)**

Prerequisite(s): PHYS 111 or 121; MATH 223 or 225 or 276; MATH 224 or 238 (may be taken concurrently).

The motion of a particle in one, two and three dimensions; the motion of a system of particles; dynamics of the motion of rigid bodies; statics, gravitation.

**PHYS 227.3
Electricity and Magnetism I
2(3L-3P)**

Prerequisite(s): PHYS 111 or 121 or both G E 125 and E P 155; MATH 223 or 225 or 276; MATH 224 or 238 (may be taken concurrently).

Electric and magnetic interactions are considered in terms of their associated fields; the concepts of capacitance, inductance, and resistance are developed and used in AC circuits.

**PHYS 251.3
Relativistic Mechanics and Quantum
Physics
1(3L-3P)**

Prerequisite(s): PHYS 111 or 121 or both G E 125 and E P 155.

Introduction to frames of reference and the variation of mass, length and time with relative velocity; the atomic theory of matter and a historical introduction to quantum mechanics leading to Schrodinger's Equation. Many of the laboratory experiments illustrate the early development of quantum mechanics.

**PHYS 304.3
Techniques of Experimental Physics I
2(3L-3P)**

Prerequisite(s): PHYS 227, 251; CMPT 116.

An introduction to techniques common to many areas of experimental physics. This includes advanced methods of experimental data analysis and a study of the most common detectors of electromagnetic radiation, from radio waves to gamma-rays. Students will perform laboratory experiments and data analysis projects which involve writing and using data analysis software.

**PHYS 322.3
Meteorology
2(3L)**

Prerequisite(s): MATH 223 or 225 or 276; PHYS 111 or 121, or both G E 125 and E P 155.

An introduction to the processes underlying observed weather phenomena. Topics include thermodynamic processes; stability and convection; radiation and heat budget. The dynamics of the atmosphere and its circulation are described, and related to synoptic meteorology. Weather forecasting is discussed. There are projects on weather observation and forecasting.

**PHYS 323.3
Mechanics II
2(3L)**

Prerequisite(s): PHYS 223 or G E 226.

Newton's laws for the general motion of particles in non-inertial reference systems. Other topics include Hamiltonian systems, Lagrange's equations, rotation of rigid bodies and the theory of small vibrations.

**PHYS 341.3
Introduction to Physical Optics
1(3L-1.5P)**

Prerequisite(s): PHYS 227; MATH 224 or 238; MATH 223 or 225 or 276.

The course will begin with the basic laws of electricity and magnetism, leading to the electromagnetic wave solution to Maxwell's equations. Further topics are: the propagation of light waves through material media and across interfaces; superposition of light waves; polarisation, interference and diffraction.

**PHYS 371.3
Statistical and Thermal Physics
1(3L)**

Prerequisite(s): PHYS 381 (may be taken concurrently); E P 271.

Following a brief introduction to basic probability concepts the course applies statistical ideas to systems of particles in equilibrium so as to develop the basic notions of statistical mechanics.

Macroscopic and microscopic aspects are discussed and illustrated in detail. Topics covered include partition functions, specific heats of molecules, effusion, quantum statistics of ideal gases, systems of interacting particles and chemical equilibrium.

**PHYS 381.3
Quantum Mechanics I
1(3L-3P)**

Prerequisite(s): PHYS 227, 251; MATH 338

(may be taken concurrently).

The Schrodinger equation is studied and applied to a number of phenomena including one-dimensional bound states, barrier penetration, scattering, angular momentum and spin, the one-electron atom and atomic structure.

**PHYS 402.3
Techniques of Theoretical Physics I
1(3L)**

Prerequisite(s): PHYS 381; EP 356; MATH 338 and 379.

Designed to develop those mathematical skills which are required for solving physical problems. Emphasis is placed on the various initial value and boundary value problems occurring in physics and engineering. This course requires that students do a large number of homework problems.

**PHYS 403.3
Techniques of Theoretical Physics II
2(3L)**

Prerequisite(s): PHYS 402.

Some special techniques of mathematical physics are dealt with in detail. The subjects covered include integral equations, calculus of variation, and the application of group theory to physical problems.

**PHYS 404.3
Techniques of Experimental Physics II
2(1L-5P)**

Prerequisite(s): PHYS 371; PHYS 381; PHYS 304 or GE 210; EP 311, 356.

Intended to make the student familiar with a variety of modern techniques in Experimental Physics including physical properties of materials and their use in the laboratory, radiation sources and radiation detection, vacuum techniques and cryogenics.

**PHYS 452.3
Subatomic Physics
2(3L)**

Prerequisite(s): PHYS 381.

This course will introduce students to various topics in nuclear and particle physics. A selection could include: NN forces; deuteron properties; shell model of nuclei; deformed nuclei; collective motion in nuclei; mesons, baryons and leptons; quantum numbers; strong, weak and electromagnetic interactions; SU(3) classification; QCD; and valence quark models of hadrons.

**PHYS 463.3
Electricity and Magnetism III
1(3L)**

Prerequisite(s): MATH 338 and E P 356.

An advanced course in electromagnetism. Techniques for electrostatics problems: Laplace's equation, separation of variables; method of images. Electrodynamics: conservation of energy and momentum, electromagnetic waves in vacuum and in material media, waveguide and transmission lines, radiation from point charges and dipoles, relativistic electrodynamics.

**PHYS 470.3
Solid State Physics
2(3L)**

Prerequisite(s): PHYS 371; PHYS 381.

Covers perturbation theory, crystal structure and binding of solids, lattice vibrations, electrons in crystalline lattices, magnetic and transport properties of solids, and superconductivity.

**PHYS 481.3 (First Offered 2002-2003)
Quantum Mechanics II
1(3L)**

Prerequisite(s): PHYS 381; MATH 266, 338.

Linear vector spaces and quantum mechanics; hermitian and unitary linear operators; Schrodinger equation in various representations; the operator method as applied to the harmonic oscillator and to angular momentum eigenvalues; the spin statistics theorem; minimal coupling of hamiltonian and electromagnetic fields; time independent perturbation theory and applications.

**PHYS 482.3
Quantum Mechanics III
2(3L)**

Prerequisite(s): PHYS 481.

Continues PHYS 481 and begins with an extensive discussion of time dependence in quantum mechanics. Exactly solvable problems such as spin-magnetic resonance are used to illustrate the time-dependent perturbation series. Applications include emission and absorption of radiation, multipole selection rules, and electron scattering from atoms and nuclei; Further topics discussed in detail are symmetry in quantum mechanics, rotation matrices and applications, many particle systems, collision theory, and variational methods including Hartree-Fock theory.

**PHYS 490.0
Physics Seminars
1&2(1S)**

Prerequisite(s): Minimum 9 credit units of 300-level PHYS or EP courses.

Students are required to attend both Departmental seminars and special student seminars. In each case the seminar material is intended to introduce students to some of the new developments in Physics and Engineering Physics.

Note: Required for Engineering Physics, Physics Honours and Physics four-year Major programs.

**PHYS 491.3(First Offered 2002-2003)
Physics Research Project
1/2(6P)**

Prerequisite(s): Permission of the department. Students must be registered in the final year of the Honours program in Physics.

The student will work on an advanced research project in Physics under the supervision of a faculty member in the department specializing in the selected area. The project will be evaluated by a committee (including the supervisor) on the basis of oral and written reports.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these

courses should contact the department for more information.

PHYS 398.3 1/2(3S)
PHYS 399.6 1&2(3S)
PHYS 498.3 1/2(3S)
PHYS 499.6 1&2(3S)

GRADUATE COURSES

Department of Physics and Engineering Physics, College of Graduate Studies & Research

The following courses are for students who have completed the Honours program in Physics, or a program in Engineering Physics; other students must obtain the permission of the instructor.

**PHYS 811.3
Classical Mechanics
1/2(3L)**

Lagrange's equation of Motion, Hamilton formulation, Phase-space considerations, Liouville theorem, Poisson brackets, Action-angle variables, Hamilton-Jacobi Equation, Integrable systems, Canonical Perturbation theory, KAM theorem, Phase-space mapping, Henon, Standard and tangent Maps, Local and Global Chaos, Dissipative systems.

**PHYS 812.3
Electromagnetic Theory
1/2(3L)**

Topics include boundary-value problems of electrostatics and magnetostatics, time varying fields, radiation and multipole fields.

**PHYS 821.3
Introduction to Aeronomy
1(3L)**

The structure and composition of the Earth's atmosphere; mean circulation, tides and wave motions; the major photochemical processes and their implications; the physical processes of the ionosphere and the magnetosphere; and experimental methods.

Note: Instruction is given jointly by members of the Institute of Space and Atmospheric Studies.

**PHYS 822.3
Radio Physics of the Upper
Atmosphere
2(3L)**

Deals with the application of radio methods to studies of the upper atmosphere. Topics discussed include the magneto-ionic theory; scattering of radio waves by meteors and aurora, scattering, generation and absorption of radio waves in the solar and terrestrial atmospheres, solar-terrestrial-relations and the methods of radio astronomy applied to upper atmospheric measurements.

**PHYS 823.3
Advanced Aeronomy
1/2(3L)**

Prerequisite(s): PHYS 821; or with permission if taken concurrently.

Basic Photochemistry. Absorption of radiation on a rotating planet. Minor constituents, diurnal variations. Airglow. Mechanical and chemical models. Environmental studies.

**PHYS 824.3
Ionospheric and Magnetospheric
Physics
1/2(3L)**

Prerequisite(s): PHYS 821; or with permission if taken concurrently.

The Earth's ionosphere and magnetosphere, also for other planets. Techniques of investigation, physical processes, structure and models.

**PHYS 826.3
Atmospheric Dynamics
1/2(3L)**

Prerequisite(s): PHYS 821; or with permission if taken concurrently.

Modern observational systems (radars, lidars and other optical systems) from ground and satellite platforms used for sounding the atmosphere up to the lower thermosphere (130km). Theoretical treatments for the mean winds, planetary waves, tides and gravity waves. Comparison of theory with observations, global reference atmospheres and global circulation models.

**PHYS 827.3
Atmospheric Spectroscopy and
Radiative Transfer
1/2(3L)**

Prerequisite(s): PHYS 821; or permission of the instructor.

Solar and terrestrial radiation; absorption, emission and scattering in terrestrial and planetary atmospheres; radiative transfer; remote sensing of atmospheric properties; climate models (greenhouse effect, atmospheric evolution).

**PHYS 833.3
General Relativity and Gravitation
1/2(3L)**

Development of the physical ideas and mathematical skills leading to general relativity as a theory of gravitation; solutions of the Einstein field equations and observational tests of general relativity; applications to black holes and cosmological models.

**PHYS 841.3
Introduction to Atomic and Molecular
Spectra
1(3L)**

Introduction to the theory of spectroscopy. Topics include spectra and structure of hydrogen and complex atoms, multiplet spectral terms, Zeeman effect, intensities of atomic spectra, rotational and vibration energy levels and spectra of diatomic and polyatomic molecules, electronic energy levels and spectra of polyatomic molecules.

**PHYS 843.3
Cybernetic Systems
1/2(3L)**

Prerequisite(s): An intermediate course in probability theory or statistical physics and a basic knowledge of the concepts of linear algebra.

Applies the theory of multiple stochastic processes to physical systems for the purposes of communication, computation and control. Techniques of filtering, linear prediction and spectral analysis in a discrete, multi-dimensional domain are emphasized. Examples from the fields of optics and geophysics are used but can be changed depending on the specific interests of the students.

**PHYS 851.3
Introductory Nuclear Physics
1(3L)**

Prerequisite(s): PHYS 482 and 452.

Introduction to electromagnetic and weak interactions as relevant to nuclear and particle physics. Symmetries in sub-atomic physics, weak decays, selection rules and electromagnetic processes.

**PHYS 852.3
Advanced Nuclear Physics
2(3L)**

Prerequisite(s): PHYS 851.

Advanced topics in nuclear and particle physics. Relativistic kinematics as it concerns experiments. Students will be required to write a review paper of a major research topic.

**PHYS 853.6
Electron Scattering
1&2(3L)**

Develops in detail the theoretical framework used in treating electron scattering from nuclei. The first half provides an introduction to quantum field theory and S-matrix expansions. These techniques are applied to derive formulae for electron scattering cross sections. The predicted form factors from various nuclear models are studied. Finally the electropion production process is studied in detail.

**PHYS 856.3
Radiation Therapy Physics
2(4L&2S)**

Prerequisite: Permission of the instructor.

Interaction of x- and gamma rays with matter, interaction of particulate radiations with matter; radiotherapy linear accelerators; radiation quality, exposure; absorbed dose; dosimetry of high energy x-ray and electron beams; x-ray dose distribution parameters; electron dose distribution parameters; brachytherapy.

**PHYS 857.3
Radiological Physics
1(4L-1S-1P)**

Prerequisite(s): Permission of the instructor.

Use of radioisotopes in medical imaging, devices and instrumentation for nuclear medicine imaging, principles of nuclear tomography, radiation protection, risk vs. benefit, facility design for radiation protection, radiobiology.

**PHYS 858.3
The Physics of Diagnostic Imaging
1(4L-2P)**

Prerequisite(s): Permission of the instructor.

An interactive lecture series designed to present the fundamental principals of x-ray, ultrasound and magnetic resonance imaging. Students will have interactive multimedia presentations and be required to translate the information presented directly into the laboratory setting. It is highly recommended that prospective students have grounding in computer applications.

**PHYS 861.3
Plasma Physics
2(3L)**

Discusses the basic concepts of plasma physics. Reading of assigned literature in plasma physics is required.

**PHYS 862.3
Plasma Waves I
1/2(3L)**

Prerequisite(s): PHYS 861.

Dispersion relations are derived for small amplitude waves in plasmas, both in the presence and in the absence of magnetic fields. The topics treated in this course include the kinetic model of the plasma, Landau damping, instabilities, the effect of inhomogeneities or wave propagation, and the effect of oscillating external fields on waves and instabilities.

**PHYS 863.3
Plasma Waves II
1/2(3L)**

Prerequisite(s): PHYS 861 and 862.

Deals with nonlinear wave phenomena in plasma physics. Quasilinear theory, the theory of a single plasma mode and the equation of Korteweg-de Vries are covered. Other topics to be chosen from the Dupree-Weinstock theory of plasma turbulence, fluctuations, wave scattering and applications to fusion plasmas.

**PHYS 864.3
Controlled Fusion
1/2(3L)**

Prerequisite(s): PHYS 861.

Plasma equilibria. Particle and thermal diffusion. MHD stability (concept of minimum B and average minimum B). Velocity space instabilities (loss-cone, trapped particle, and beam-driven instabilities). Plasma heating (ohmic, compression, neutral beam, wave). New concepts.

**PHYS 865.3
Plasma Transport Properties and
Diagnostic Techniques
1/2(3L)**

Prerequisite(s): PHYS 861.

Provides a kinetic theory treatment of plasma transport phenomena - conductivity, diffusion, heat flow - and the relaxation times for particle deflection, momentum transfer, energy relaxation. Various plasma measurement techniques are then discussed, including the use of microwaves, probes, laser scattering and particle energy analyzers.

**PHYS 881.6
Quantum Mechanics
1&2(3L)**

Designed to acquaint students with some of the concepts of quantum mechanics.

**PHYS 883.3 – Quantum Mechanics
1/2(3L)**

Concepts in advanced quantum mechanics. Topics include perturbation theory, relativistic corrections, scattering theory, second quantization, non-relativistic QED, and selected applications to subatomic, atomic, molecular, or solid-state systems.

**PHYS. 884.3 – Quantum Field Theory
1/2(3L)**

Fundamental concepts in quantum field theory. Topics include relativistic field

equations; canonical and path integral quantization; symmetries, conservation laws, and symmetry breaking; interacting field theories relevant to condensed matter and subatomic physics; tree-level processes.

**PHYS 893.3
Selected Topics in Physics and
Engineering Physics
1/2(3L)**

Prerequisite(s): Permission of the instructor.

Advanced topics in Physics and Engineering Physics selected to aid graduate students with their research. Consists of assigned readings in texts and/or scientific journals, related discussions, and additional lectures.

**PHYS 894.3
Selected Topics in Theoretical
Physics
1/2(3L)**

Prerequisite(s): Permission of the instructor.

Advanced topics in theoretical physics selected to aid graduate students with their research. Consists of assigned readings in texts and/or scientific journals, related discussions, and additional lectures.

**PHYS 895.3
Selected Topics in Subatomic
Physics
1/2(3L)**

Prerequisite(s): Permission of the instructor.

Advanced topics in subatomic physics selected to aid graduate students with their research. Consists of assigned readings in texts and/or scientific journals, related discussions, and additional lectures.

**PHYS 896.3
Selected Topics in Plasma Physics
1/2(3L)**

Prerequisite(s): Permission of the instructor.

Advanced topics in plasma physics selected to aid graduate students with their research. Consists of assigned readings in texts and/or scientific journals, related discussions, and additional lectures.

**PHYS 897.3
Selected Topics in Space and
Atmospheric Physics
1/2(3L)**

Prerequisite(s): Permission of the instructor.

Advanced topics in space and atmospheric physics selected to aid graduate students with their research. Consists of assigned readings in texts and/or scientific journals, related discussions, and additional lectures.

**PHYS 898.3
Special Topics
1/2(3L), 1&2(3L)**

Consists of assigned reading in texts and scientific journals on which the students report; additional lectures by the professor in charge are also given. Depending on the interests of the students, the topics are in the field of nuclear, or theoretical or upper atmospheric physics.

**PHYS 990
Seminar**

Papers on recent developments in Physics and Engineering Physics are given. Candidates for the Master's degree and for the Ph.D. degree in this department are required to participate.

PHYS 994 Research

Students writing a Master's thesis in physics must register for this course.

PHYS 996 Research

Students writing a Ph.D. thesis in physics must register for this course.

PHYSIOLOGY

Department of Physiology, College of Medicine

For details on the B.Sc. in Physiology see the College of Arts & Science.

PHYSIO 202.9 Physiology PA

Prerequisite(s): Restricted to students enrolled in the College of Medicine or the College of Dentistry.

An introduction to the basis mechanisms underlying the functions of the major organs and organ systems in mammals and the ways that these functions are controlled and coordinated in the normal, healthy state.

PHYSIO 334.6 Experimental Basis of Physiology 1&2(6-8P)

Prerequisite(s): BIOCH 200 and 211; H SC 208; PHYS 111.

A laboratory course on the various approaches and techniques commonly used to investigate physiological phenomena and to study their underlying mechanisms.

Note: Since enrollment will be limited, students are advised to contact the department early if they wish to take this course.

PHYSIO 336.3 (Formerly 335) Excitable Cells 1(3L)

Prerequisite(s): H SC 208 or ANAT 200.

The integrated study of bioelectrical mechanisms of cellular excitability and excitation coupled functions including contraction, secretion and signal transduction.

Note: Students with credit for PHYSIO 335 may not take this course for credit.

PHYSIO 337.3 (Formerly 335) Cellular Basis of Physiological Function 2(3L)

Prerequisite(s): BIOCH 200, 211; H SC 208.

Cellular mechanisms underlying physiological functions in mammals. Topics include mechanisms of communication between cells, uptake and secretion of water, ions, nonelectrolytes and macromolecules, and integration of cell functional and metabolic activities.

Note: Students with credit for PHYSIO 335 may not take this course for credit.

PHYSIO 346.3 Cardiovascular Physiology 1(3L)

Prerequisite(s): H SC 208; PHYS 111.

Functions and controls of the heart and blood vessels in humans and other mammals, and the mechanisms regulating arterial pressure, blood volume and blood flow.

PHYSIO 347.3 Respiratory Physiology 1(3L)

Prerequisite(s): H SC 208; PHYS 111.

Mechanisms of respiratory gas exchange at lungs and tissues, gas transport in the blood, and the regulation of the respiratory system at rest and during exercise.

PHYSIO 348.3 Endocrinology 2(3L)

Prerequisite(s): H SC 208; BIOCH 200 and 211; completion of or enrollment in PHYSIO 336 and 337 (or 335).

Hormonal control mechanisms. Topics include neuroendocrinology and examples of hormonal control in reproduction, metabolism, growth, calcium homeostasis and gastrointestinal function.

Note: Students with credit for PHYSIO 434 may not take this course for credit.

PHYSIO 432.6 Physiological Research 1&2(10P)

Prerequisite(s): PHYSIO 334, 336, 337 (or 335).

Advanced work in a selected area of physiology. This normally consists of a laboratory research project done under the direct supervision of a faculty advisor.

Note: This course is usually restricted to students in the Honours program in physiology, but may, under special circumstances, be offered to others in the fourth year of a physiology major.

PHYSIO 434.3 Environmental Physiology I: Basic Concepts 1 (2L, 1S)

Prerequisites: PHYSIO 336, 337, 334 and 6 credit units from PHYSIO 346, 347, 348 and H SC 350.

An organism's phenotype is defined by both genetic and environmental influences. The organism presents an open system which presents special problems for the preservation of an interior environment within narrow limits in the face of variations in external conditions. This course examines how humans and other mammals, sense, interact and adapt to changing environments.

Note: Students with credit for PHYSIO 433.6 may not take this course for credit.

PHYSIO 435.3 Environmental Physiology II: Transitions and Adaptations 2 (2L, 1S)

Prerequisite: PHYSIO 434.

From living and working under the sea to the space station, humans have extended their habitats far beyond their hunting-gathering origins in the lowlands of Africa. This course will examine the responses and adaptations to a variety of environmental conditions, starting with the harshest and

most dangerous transition of all, birth, to living and working in space.

Note: Students with credit for PHYSIO 433.6 may not take this course for credit.

PHYSIO 490.0 Seminars in Physiology

Prerequisite(s): PHYSIO 334, 336, 337 (or 335) and registration in the fourth year of a major or Honours program in physiology.

Students in the fourth year of the Four-year or Honours program in physiology are required to attend departmental seminars and to participate in the presentation and discussion of papers in the departmental journal club.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the program co-ordinator or administrative committee for more information.

PHYSIO 298.3 1/2(3S)

PHYSIO 299.6 1&2(3S)

PHYSIO 398.3 1/2(3S)

PHYSIO 399.6 1&2(3S)

PHYSIO 498.3 1/2(3S)

PHYSIO 499.6 1&2(3S)

GRADUATE COURSES

Department of Physiology, College of Graduate Studies & Research

The following courses are open to students of other Departments. Students wishing to register in any of the courses should consult with the Department.

PHYSIO 736.3 (Formerly PHYSIO 825.6) Excitable Cells 1/2(3L)

The integrated study of bioelectrical mechanisms of cellular excitability and excitation coupled functions including contraction, secretion and signal transduction.

Note: Contact the department for availability.

PHYSIO 737.3 (Formerly PHYSIO 825.6) Cellular Basis of Physiological Function 1/2(3L)

Prerequisite(s): Permission of instructor.

Cellular mechanisms underlying physiological functions in mammals. Topics include mechanisms of communication between cells, uptake and secretion of water, ions, nonelectrolytes and macromolecules, and integration of cell functional and metabolic activities.

Note: Contact the department for availability.

PHYSIO 746.3 (Formerly PHYSIO 826.3) Cardiovascular Physiology 1/2(3L)

Review of the functions and control of the heart and blood vessels in humans and other mammals, and of the mechanisms regulating arterial pressure, blood volume and blood flow. Offered alternate years.

Note: Students with credit for PHYSIO 346.3, 426.3 or 826.3 may not take this course for credit.

PHYSIO 747.3 (Formerly PHYSIO 827.3) Respiratory Physiology 1/2(3L)

Mechanisms of respiratory gas exchange at the lungs and tissues; gas transport in the blood; acid-base balance and regulation of the respiratory system under a variety of conditions such as exercise, high altitude, diving, and certain disease states.

Note: Offered alternate years. Students with credits for PHYSIO 347.3, 427.3, or 827.3 may not take this course for credit.

PHYSIO 748.3 (Formerly PHYSIO 834.3) Endocrinology 1/2(3L)

Nature, action and control of endocrine secretions. Topics include neuroendocrinology and examples of hormonal control in reproduction, metabolism, growth, calcium homeostasis and gastrointestinal functions.

Note: Offered alternate years. Students with credits for PHYSIO 348.3, 434.3, or 834.3 may not take this course for credit.

PHYSIO 750.3 (Formerly PHYSIO 834.3) Integrative Neuroscience 1/2(3L)

Mechanisms of integration of neural signals. Examples will be used to show how different types of sensory input are integrated at various levels of the nervous system to evoke appropriate effector responses.

Note: Offered alternate years. Students with credits for PHYSIO 349.3, 350.3, 429.3, or 829.3 may not take this course for credit.

PHYSIO 828.3 Physiology of Body Fluids 1/2(3L)

An advanced course on the composition, functions and regulation of various body fluids, the maintenance of acid-base balance and the functions and control of the kidney.

PHYSIO 845.3 Ion Channels: Principles and Methodology 1/2(2L&1S)

Prerequisite: Permission of the coordinator.

Explores ion channel mechanics and the role of a variety of ion channels in normal and pathological cellular functions. Students will become familiar with the methodologies used in the study of ion channels, with a special emphasis on patch-clamp technology.

PHYSIO 898.3/899.6 Special Topics 1/2(3R/P), 1&2(3R/P)

Work in selected areas of physiology may be undertaken by advanced students with the consent of the department. This work may consist of essays, readings, and reports on assigned topics and/or a series of laboratory exercises.

PHYSIO 990 Seminar

Throughout their program, graduate students in Physiology are required to attend department seminars and to participate in the presentation and discussion of papers in the journal club.

**PHSIO 994
Research**

Students writing a Master's thesis must register for this course.

**PHSIO 996
Research**

Students writing a Ph.D. thesis must register for this course.

PLANT SCIENCES

Department of Plant Sciences, College of Agriculture

**PL SC 41.6
Introductory Plant Science
1(3L-3P)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture.

An introduction to the basic principles of plant anatomy, morphology, physiology, growth and development in relation to crop production. The course also addresses the responses of plants to their environment, including interactions with, and the effects of, factors such as competition (crop plants and weeds), temperature, moisture, nutrients, diseases and insects. Crop production management practices and their impact on crop productivity are also considered.

**PL SC 51.3
Cereal Crops I – Wheat
2(3L-2P)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture.

This course focuses on the various market classes of wheat produced in Canada. It considers their importance domestically and internationally. Consideration is given to important grain quality characteristics and how these factors fit with market demands and utilization of the various types of wheat. Agronomic characteristics and production practices which will maximize quality and productivity are discussed.

**PL SC 52.3
Cereal Crops II
2(3L-3P)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture.

The organization and emphases of this course are similar to those of Cereal Crops I, except that it covers cereal crops other than wheat, including rye, triticale, barley, oats, corn, rice, wild rice, canary seed, sorghum and millet. The quality characteristics and utilization of each crop will be considered, along with agronomic characteristics and production practices.

**PL SC 53.3
Introduction to Horticulture
2(3L)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture.

This course introduces students to the production, marketing and utilization of horticultural crops adapted to the Canadian prairies. Farm operations varying from

hobby gardens through to commercial scale will be used to illustrate course concepts. Crops covered include fruit, vegetables, greenhouse crops, wildcrafting, herbs and medicinals.

**PL SC 54.3
Weed Biology
2(3L-2P)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture.

This course considers the nature of annual, winter annual and perennial weed infestations in various types of crops. It describes weed growth and development, factors affecting the spread of weeds, and the nature and extent of losses due to weeds.

**PL SC 55.3
Weed Control
2(3L-3P)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture.

Both chemical and non-chemical weed control methods are outlined and the factors that determine their effectiveness are discussed. The emphasis is placed on the development of weed control programs that are agronomically, environmentally and economically sound. Herbicide mode of action and the development of herbicide resistance in weed species are considered.

**PL SC 56.3
Environmental Studies
2(3L)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture.

This is an introductory course on the basic principles of ecology. It relates us to the world environment, emphasizing our dependence on the interrelationships between solar energy, air, water, soil and living organisms. Topics discussed include the functioning of ecological systems such as fields, lakes and forests, the meaning of air and water pollution and ecotoxicity, and the impact of agriculture and population increases on the environment.

**PL SC 57.3
Agrometeorology
2(3L-1T)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture.

This course discusses the processes by which weather elements affect various aspects of agriculture, including crop growth and development, disease incidence, animal metabolism, planting and harvesting dates, spray scheduling, and the use and design of shelterbelts and farm buildings. Knowledge gained will aid in interpreting weather data and forecasts, understanding variations in climate with changes in topography, and understanding implications of climatic change.

**PL SC 58.3
Forage Crops
2(3L-2P)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture.

This course introduces students to the production, handling and marketing of

forage crops. A number of native and introduced plants used for pasture, hay and silage are discussed. Topics addressed include sustainable production and goals, selection and production of cultivated plants, the care of native species, and forage economics.

**PL SC 63.3
Pedigreed Seed Production
1(3L-2P)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture.

Outlines the basic principles and practices involved in the Canadian pedigreed seed system. Practical aspects of seed production are considered, with emphasis on the scientific principles behind the regulations. Various groups and agencies and their roles in seed production are described. The development, evaluation, registration and release of new cultivars are also considered, related to both hybrids and synthetics.

**PL SC 65.3
Fruit and Vegetable Crops
1(3L-2P)**

Prerequisite(s): PL SC 53.3 and enrolled in the Diploma in Agriculture program in the College of Agriculture.

Production of fruit and vegetable crops represents a promising area for agricultural diversification, with opportunities for start-up through to commercial scale production. This course provides information on production and marketing of selected fruit and vegetable crops suited to the production conditions and market needs of the Canadian prairies.

**PL SC 71.3
Oilseeds
2(3L-2P)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture.

The chemical, physical, and nutritional characteristics of fats and oils are discussed, with emphasis on similarities and differences among the oils produced by the various oilseed crops, including those not grown in western Canada. Oilseed crops important to western Canada are discussed with respect to agronomic and quality characteristics, growth and development, and production practices to maximize grain quality and crop yield.

**PL SC 72.3
Pulse Crops
2(3L-2P)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture.

The nutritional and agronomic characteristics of grain legume crops are discussed with major emphasis on those adapted to western Canada. Growth and development characteristics of species and cultivars are considered in relation management practices presently used in western Canadian agriculture or available for adoption. Control of weeds, insect pests and diseases is also considered.

**PL SC 73.3
Rural Landscaping
2(3L-2P)**

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture.

This course introduces students to plant materials, the theory and utility of plant use, and the economics and esthetic benefits of landscaping. Students will gain the ability to identify landscape plants and incorporate them effectively into a landscape. Plants considered will be prairie-hardy evergreen and deciduous trees, shrubs, and annual and perennial flowers.

**PL SC 88.3 and 89.6
Special Topics**

These courses are offered occasionally in special situations to students enrolled in the Diploma in Agriculture program in the College of Agriculture. Interested students should contact the Department of Plant Sciences for more information.

DEGREE COURSES**PL SC 113.3
Introduction to Soils and Horticulture
1(3L)**

Introduction to general characteristics of soils and some of the processes and relationships associated with them. The horticultural portion includes an introduction to the various areas in horticulture, the growth and development of various horticultural crops and the effect of various environmental conditions. Numerous horticultural practices will also be demonstrated.

Note: Non-credit for B.S.A. students.

**PL SC 213.3
Principles of Ecology
2(3L-3P)**

Designed for students in the College of Agriculture. It considers the nature of ecosystems and of processes associated with energy flow and material cycling within them. Particular attention is given to ecosystems of Western Canada and the effect that man exerts on them, especially through agricultural practices.

Note: Students with credit for BIOL 253 may not take this course for credit.

**PL SC 220.3
Fundamentals of Horticulture
1(3L-2P)**

Prerequisite(s): BIOL 110.

An introduction to the economic, nutritional and aesthetic value of horticulture emphasizing its importance and impact. Consideration is given to vegetable, fruit, turf grasses, nursery, and greenhouse production as well as landscaping, herbs, and medicinal plants. Emphasis is placed on Saskatchewan production in relation to regional, national and international markets. Laboratories consist of field trips and hands-on exercises.

**PL SC 301.3
Principles of Agronomy
2(3L)**

Ecological factors affecting production of field crops, with particular reference to the Canadian prairies. The physical environment. Adapting crops and

management practices to the environment. Soil and water conservation.

**PL SC 311.3
General Apiculture
2(3L)**

Introduction to the science and practice of beekeeping. Subjects include the morphology and physiology of the honey bee, beekeeping equipment, manipulation of bees, swarm control, increase, honey production, bee diseases and wintering.

**PL SC 314.3
Statistical Methods
1/2(3L-2P)**

An introduction to statistical methods and their application to experiments. Includes probability, means and variances, "t" tests, analysis of variance, experimental designs, simple regression and correlation, and chi-square tests. Designed for students in the biological sciences.

**PL SC 322.3
Rangeland Resource: Ecology and Management
1(3L-2P)**

Prerequisite(s): BIOL 253 or PL SC 213 is strongly recommended.

Emphasizes principles of managing rangeland to ensure productivity and multiple-uses. Inventory, evaluation and planning for multiple-use management. Plant morphology and physiology, palatability, energy flow, nutrient cycling and the hydrologic cycle are integrated and discussed in relation to impacts of grazing on the soil-plant-animal system.

**PL SC 331.3
World Crops
2(3L-1P)**

A study of the origin, botany, distribution, production and utilization of the world's major cereal, pulse, oil, sugar, fiber and beverage crops. Some industrial and medicinal crops will also be discussed.

**PL SC 332.3
Horticulture Entomology
1(3L-3P)**

Prerequisite(s): BIOL 110; or permission of the instructor.

Introduction to insect problems of horticultural crops. This involves a practical emphasis on problem diagnosis and some consideration of subsequent management in an ecological context. The diagnosis and management of insect problems are specifically oriented towards vegetable, fruit, and ornamental crops in commercial fields, protected environments, recreational areas and gardens.

Note: Students planning to enroll in this course are expected to make a collection of at least 30 examples of horticultural insect pests and associated damaged plant material during the summer preceding the class. The instructor must be contacted the preceding spring for details.

**PL SC 340.3
Weed Biology and Ecology
1(3L-2P)**

Prerequisite(s): AGRIC 111; AGRIC 112; or at least one 200-level botany course (e.g., BIOL 202 or 205).

Growth, reproduction and spread of weeds, influence of agronomic and edaphic factors on weed community structure, weed-crop competition, and biological and mechanical

control of weeds. Concludes with a discussion of the use of combined control methods (biological, mechanical and chemical) in integrated weed management.

**PL SC 345.3
Biological Activity and Fate of Herbicides
2(3L-2P)**

Prerequisite(s): CHEM 251; PL SC 340; or permission of the instructor.

The use of herbicides for weed control, factors affecting herbicide activity and fate of herbicides in the environment are discussed. Includes the biological activity of soil and foliar applied herbicides, herbicide modes of action and resistance, and dissipation of herbicides in soil. Herbicide registration, environmental legislation and residue tolerance levels in various products are also discussed.

**PL SC 361.3
Agricultural Meteorology
2(3L-3P)**

A study of atmospheric processes as they affect organisms of agricultural importance. Emphasis is placed on the physical factors that make up the agricultural environment. Includes weather processes, energy and mass exchange, agricultural climate indices and crop forecasting, water management, and microclimate modification.

**PL SC 405.3
Evolution and Population Genetics
2(3L-2P)**

Prerequisite(s): BIOL 211.

A discussion of the roles of mutation, recombination, selection, hybridization, polyploidy and reproductive isolation in the micro-evolution of living organisms. Basic population genetic theory is one means used to illustrate these roles.

**PL SC 411.3
Plant Breeding
1(3L-2T)**

Prerequisite(s): BIOL 110, 202, and 211; PL SC 314.

Introduces the principles of genetics and plant breeding. Tutorials involve topic discussion and problem solving.

**PL SC 412.3
Physiological Plant Ecology
1(3L-3P)**

Prerequisite(s): BIOL 253 or PL SC 213.

Studies the physiological basis for the interaction of the individual species with its environment. Includes the energy environment of the plant and how temperature, light, water status, soil conditions, etc. affect plant function and distribution.

**PL SC 416.3
Applied Plant Biotechnology
2(3L-2P)**

Prerequisite(s): BIOCH 220; BIOL 202 and 211.

Introduces techniques of biotechnology which have the potential to be utilized in plant improvement. Includes wide hybridization, cytoplasmic male sterility, tissue and cell culture, protoplast fusion and gene transfer at the DNA level.

**PL SC 417.3
Crop Physiology
1(3L-3P)**

Prerequisite(s): BIOL 331.

An outline of interrelationships between physiological activity and crop growth with emphasis on energy conversion and analysis of autotrophic growth in an agronomic environment. Germination, growth integration, flowering and senescence are also to be considered. Physiological responses to environmental stresses such as water, temperature, salinity, nutrients and disease are related to crop productivity.

**PL SC 418.3
Management of Arable Grassland
2(3L)**

Physiology and growth analysis of the more important pasture species. Effect of climate, soil type and fertilizers on yield. Influence of grazing on composition and yield. Establishment and maintenance of temporary, short rotation and permanent pasture. Irrigation in pasture management. Weed control. Plot techniques used in pasture analysis.

**PL SC 420.3
Grain Chemistry and Technology
1(3L)**

Chemical composition, processing and utilization of the principal starch, sugar, oil, protein and fiber crops of the world. The effects of variations in seed characteristics and composition on the quality of the final food, feed and industrial products is emphasized.

**PL SC 423.3
Landscape Ecology and Vegetation Management
2(3L-2P)**

Prerequisite(s): BIOL 253 or GEOG 270 or PL SC 213; or permission of the instructor.

Current theories relating to structure, functioning, and composition of landscapes and human impacts on natural ecosystems, landscape-level processes and patterns, and succession. Developing management plans for natural and remnant landscape elements, and inducing successional changes, and monitoring impacts will be covered. Field trips will be required.

**PL SC 430.3
Ornamental Plants
1(3L-2P)**

Prerequisite(s): PL SC 220.

Studies the identification of ornamental trees, shrubs, perennials, biennials, and annuals commonly grown in Saskatchewan. Consideration is also given to culture, propagation and use.

**PL SC 432.3
Conservation of Plant Genetic Diversity
1(3L-2P)**

Prerequisite(s): BIOL 110.

Introduction to the ecological, environmental and genetic aspects of diversity in plants. Factors affecting diversity in agricultural and horticultural species and their wild relatives. Global efforts to conserve biological diversity and their consequences will be critically reviewed.

**PL SC 433.3
Greenhouse Structures and Crops
2(3L-2P)**

Prerequisite(s): PL SC 220.

Review of greenhouse construction and plant operation. The commercial production, timing, harvesting, diseases and pests of floriculture crops are discussed.

**PL SC 434.3
Range Ecosystems and Plants
2(2L-4P)**

Prerequisite(s): BIOL 253 or PL SC 213; BIOL 323 or 424; PL SC 322; or permission of the department.

Identification, ecology, management and importance of major rangeland ecosystems and their plants in Western Canada and United States. Emphasizes the identification, management considerations, habitat and forage value for wildlife and livestock, uses in ecosystem restoration. A collection of 100 plants is required and must be made by each student the summer before taking the course.

**PL SC 435.3
Landscape Design
2(2L-2P)**

Prerequisite(s): PL SC 220 and 430; or permission of the instructor.

An introduction to the principles and practices of landscape design. A variety of landscape settings are considered with emphasis on residential properties.

**PL SC 436.3
Wildland Ecology
1(3L-3P)**

Prerequisite(s): BIOL 253 or PL SC 213.

Designed to instruct the advanced student in ecological principles and problems pertaining to the vegetated landscapes of non-agricultural areas, particularly Canada's forests, peatlands and tundra. Laboratory periods will emphasize familiarization with Canada's wildland regions and the application of ecological methods in their study.

**PL SC 441.3
Advanced Fruit Growing
2(3L-2P)**

Prerequisite(s): PL SC 220.

Fundamentals of commercial fruit production including environmental adaptation, breeding, site development, marketing, cultural management, tree fruits, small fruits, tropical fruits, harvesting, diseases and pests.

**PL SC 451.3
Advanced Vegetable Growing
1(3L-2P)**

Prerequisite(s): PL SC 220.

Principles of production and management of vegetable crops are reviewed with illustrations from contemporary research literature. The content is focused on crops, production situations and limitations encountered in Saskatchewan. Local field trips are planned.

**PL SC 452.3
Current Issues in Crop Science
2(3L)**

Prerequisite(s): PL SC 301, 331, 340, 411, 418.

Designed to ensure that graduates in crop science are familiar with the current issues

and problems in the field of their specialization and are aware and knowledgeable of recent technological advances. Topics will vary from year to year but in all cases will relate to practical aspects of crop productivity.

PL SC 461.3
Post-Harvest Management of HORT Crops
2(3L)

Prerequisite(s): PL SC 220; or permission of the department.

Principles of storage and handling of horticultural crops are reviewed with illustrations from contemporary research literature. Physiological processes underlying management practices are examined. The focus is on commodities and practices of local importance.

PL SC 462.3
Plants and Microclimate
2(3L-3P)

Prerequisite(s): PL SC 361 (or GEOG 233 or PHYS 322) or AGRIC 210; PHYS 111; or permission of the instructor.

A treatment of the physical basis for the interactions between plants and their atmospheric and edaphic environments. The main emphasis will be placed on the study of the exchange of radiation, heat and matter between the environment and individual leaves, soil surfaces and, particularly, plant communities.

PL SC 470.3
Plant Propagation and Nursery Management
1(3L-2P)

Prerequisite(s): PL SC 220.

The principles and the commercial practices of multiplication of plants by seeds and asexual methods, cultural practices, storage and sale station operation. Local field trips are planned.

PL SC 480.3
Turfgrass Culture
1(3L)

Prerequisite(s): PL SC 220.

The principles of environmental effects and the management practices involved in the production and maintenance of refined turf for landscape and athletic purposes. Local field trips are planned.

SPECIAL TOPICS

PL SC 498.3

These courses are offered occasionally in special situations. Students interested in such opportunities should contact the department for information on offerings.

GRADUATE COURSES

Department of Plant Sciences, College of Graduate Studies & Research

PL SC 803.3
Advanced Plant Breeding
2(3L-2T)

Prerequisite(s): PL SC 411 or equivalent; or permission of the instructor and PL SC 816 or equivalent.

Deals with important theoretical and applied issues related to crop improvement in both self-pollinated and cross-pollinated

species. Theoretical aspects of artificial selection, genetic variability and population structure will be considered along with the practical implications of field testing, cultivar increase and release, and plant breeding regulations.

PL SC 804.3
Processing and Analysis of Grain Crops
2(2L-4P)

Prerequisite(s): BIOCH 220.

Grain and oilseed processing technologies and end-uses will be reviewed, as will the characteristics of grains and oilseeds which influence quality, utility and value. Laboratories will provide hands-on experience with current procedures for predicting grain quality.

PL SC 811.3
Population and Conservation Genetics
2(3L)

Prerequisite(s): BIOL 211 and PL SC 405.

Basic conditions for maintaining genetic variability in populations. Effects of environmental changes on genetic diversity. Effects of mating system and population size on genetic structures of populations. A study of the causes of loss of genetic diversity and strategies for preservation with emphasis on plant genetic resources.

PL SC 812.3
Physiological Plant Ecology
1(3L-3P)

Prerequisite(s): Courses in plant ecology and plant physiology; or permission of the instructor.

A study of the physiological basis for the interaction of the individual species with its environment. Included are discussions of the energy environment of the plant and how temperature, light, water status, soil conditions etc., affect plant function and distribution.

PL SC 813.3
Statistical Methods in Life Sciences
2(3L)

Prerequisite(s): PL SC 314.

Some parametric statistical methods commonly used in agriculture and experimental biology. Introduction to factorial experiments and analysis of covariance. Emphasizes the principles and procedures of experimental designs.

PL SC 814.3
Topics in the Physiology of Crop Plants
1(3L)

Physiological processes involved in plant growth and development, with emphasis on yield formation in crops. Topics include growth stage systems, germination, phenology, seed set and seed growth, yield components, senescence and yield management.

PL SC 815.3
Applied Plant Cytogenetics
1(3L-3P)

The application of cytogenetics to plant breeding. Topics include chromosomal aberrations, crop evolution, interspecific hybridization, gene transfer, euploidy and aneuploidy.

PL SC 816.3
Quantitative Genetics
1(3L)

The genetical and statistical concepts of quantitative variation in crop plants. Emphasis will be on factors which affect direct and correlated response to artificial selection. Methods of quantitative genetic research will be considered.

PL SC 817.3
Population Genetics
2(3L)

Prerequisite(s): BIOL 211 and PL SC 405.

Basic conditions for maintaining genetic variability in populations. Effects of environmental changes on genetic diversity. Effects of mating system and population. A study of the causes of loss of genetic diversity and strategies for preservation with emphasis on plant genetic resources.

PL SC 818.3
Physiology and Biochemistry of Herbicide Action
2(3L)

Prerequisite(s): PL SC 340; or equivalent.

The physiology and biochemistry of herbicide action, from the point of entry into the plant to the events leading to plant death. The fate of herbicides in plants (foliar and root absorption, translocation, and metabolism) is discussed first, followed by an examination of the various mechanisms of herbicide action. Topics such as selectivity, herbicide resistance and structure-activity relationships are also covered.

PL SC 822.3
Range Management
1(3L-2T)

Prerequisite(s): Permission of the instructor.

Emphasizes the principles of managing rangeland to ensure sustained productivity. Plant morphology, physiology, palatability, nutritional value, energy flow, and nutrient cycling are integrated and emphasized in relation to the impacts of grazing on soil-plant-animal interactions. Inventory, evaluation, and manipulation of rangeland resources are also studied. Field trips are required.

PL SC 823.3
Landscape Ecology and Vegetation Management
2(3L-2P)2 (3L-2P)

Prerequisite(s): BIOL 253, GEOG 270, PL SC 213; or permission of the instructor.

Current theories relating to structure, functioning and composition of landscapes and human impacts on natural ecosystems, landscape-level processes and patterns, and succession. Developing management plans for natural and remnant landscape elements, and inducing successional changes, and monitoring impacts will be covered.

PL SC 824.3
Biotechnology in Crop Development
1/2(3L)

Prerequisite(s): BIOCH 220, BIOL 202, 325, 331; or permission of the instructor.

An overview of the current status of the application of biotechnology to crop improvement. The class will emphasize the

role of genetic engineering in plant breeding and will include a survey of the techniques available and a review of current and prospective areas of application.

PL SC 831.3
Wildland Ecology
1(3L-3P)

Prerequisite(s): Courses in plant ecology or animal ecology, and a course in plant taxonomy.

Ecological principles and problems pertaining to vegetated landscapes of non-agricultural areas, particularly Canada. Structure, composition and genesis of vegetated landscapes and their ecology, with emphasis on ecological methodology.

PL SC 841.3
Advanced Fruit Growing
2(3L-2P)

Fundamentals of commercial fruit production including environmental adaptation, breeding, site development, marketing, cultural management, tree fruits, small fruits, tropical fruits, harvesting, diseases and pests.

Note: Students with credit for PL SC 441 may not take this course for credit.

PL SC 850.3
Advanced Vegetable Growing
1(3L-2P)

Fundamentals of commercial vegetable production outdoors and under glass. Breeding, planting, culture, harvesting, grading, diseases and pests are discussed.

Note: Students with credit for PL SC 450 may not take this course for credit.

PL SC 862.3
Plants and Microclimate
2(3L-3P)

Prerequisite(s): Permission of the instructor.

A treatment of the physical basis for the interactions between plants and their atmospheric and edaphic environments. The main emphasis will be placed on the study of the exchange of radiation heat and matter between the environment and individual leaves, soil surfaces and, particularly, plant communities.

PL SC 870.3
Principles of Plant Propagation and Nursery Management
1(3L)

Principles and commercial procedures for the propagation and nursery management of horticultural plants. Term papers will also be required.

PL SC 891.3
Literature Survey
1/2 or 1&2(R)

Reading will be assigned for the purpose of extending the student's knowledge of chosen subjects.

PL SC 898.3
Special Topics
1/2(1L-3P)

Assigned reading and tutorials in a specific field related to the student's major interest. Students will be required to prepare reviews or seminars on specific topics.

**PL SC 990
Seminar**

Reviews of literature and recent investigations. Graduate students are required to attend and present papers during the period of their candidacy.

**PL SC 992.6
Project**

M.Agr. students must complete this course as part of the requirements for the degree.

**PL SC 994
Research**

Students writing a Master's thesis must register for this course.

**PL SC 996
Research**

Students writing a Ph.D. thesis must register for this course

POLITICAL STUDIES

Department of Political Studies, College of Arts & Science

The Department of Political Studies has introduced two three credit unit courses, POLST 111.3 and POLST 112.3, to replace POLST 110.6. After the 2002 Spring and Summer Session, POLST 110.6 will be offered only as a web-based course through Extension Credit Studies. The maximum number of 100-level political studies credit units which may be completed for credit is six. All upper year courses in political studies require as a prerequisite six credit units at the 100-level, except as noted.

**POLST 110.6
Introduction to Political Studies
1&2(3L)**

An introduction to the study of government and politics by way of an examination of political processes and structures, the Canadian political system, and major themes and concepts such as power, freedom, rights, equality, authority and legitimacy.

**POLST 111.3
Democracy in North America
1/2(3L)**

An introduction to the study of politics through an examination of contemporary issues and ideas that arise in and between the democratic systems of Canada, the United States and Mexico, including democracy, sovereignty, aboriginal issues, NAFTA, globalization, identity, rights, representation and political participation.

**POLST 112.3
Political Ideas and Change in a
Global Era
1/2(3L)**

An introduction to political ideas and change in a global era. The course explores themes such as nationalism, ideology, development, democratization, globalization, sovereignty, conflict and human rights.

**POLST 203.6
Government of Canada
1&2(3L)**

A study of the institutions and processes of Canadian government. Particular attention is given to the constitution, federalism, the executive, legislative and judicial processes, the electoral system and voting behaviour, political parties, and pressure groups.

**POLST 220.6
Public Administration
1&2(3L)**

A comparative analysis of the public services and the machinery of government in Great Britain, the United States, and Canada, with particular reference to the legal basis, organization, management, and political and judicial control of the administrative processes.

**POLST 235.6
Introduction to the History of
Political Thought
1&2(3L)**

Introduces the political visions of key political thinkers from the ancient Greeks to the end of the nineteenth century. The perennial problems of politics and various alternative solutions will be discussed.

**POLST 240.6
West European Politics
1&2(3L)**

Examines the major West European political systems and policy processes from a comparative perspective, and the European Union.

**POLST 241.3
East Central European Politics
1/2(3L)**

Designed to introduce the student to the politics and society of East Central Europe. Focusing on the idea of "failed modernity," the legacies of empire and authoritarianism will be examined and assessed with respect to how each shaped and defined the course of 20th century East Central European political development.

**POLST 242.6
Government and Politics of the
United States
1&2(3L)**

An inquiry into the evolution and workings of the American national government. The course will study American political thought, political culture, political institutions and political processes.

**POLST 243.3
Russia and the Former Soviet Union:
The Politics of Change
1/2(3L)**

Focuses on the politics associated with efforts to transform the Soviet successor states into capitalist liberal democratic systems. Topics include: nature of the previous Soviet system, the economic transformations, emergence of civil society, ethnic divisions and conflicts, the development of multi-party systems, nation-building and foreign relations.

**POLST 246.6
The Politics of the Third World
1&2(3L)**

An analysis of the political processes and structures within developing countries with primary emphasis on sub-Saharan Africa

and the countries of the South Pacific. Major topics for consideration include the colonial period, the rise of nationalist parties, and within the independence period, ideology and political leadership, the effects of social and economic structures, the roles of traditional and modern groups and the problems of development and underdevelopment.

**POLST 247.6
Comparative Politics of Latin
America
1&2(3L)**

An introduction to the problems of development and change in Latin America through the comparative analysis of four case studies: Mexico, Cuba, Chile and Nicaragua. Designed to provide an understanding of modern Latin American politics through the examination of various factors affecting the political systems.

**POLST 252.6
Political Sociology
1&2(3L)**

Prerequisite(s): 6 credit units of 100-level POLST or SOC 110.

A study of the relationships between societal structures and the state. It will examine the political sociology of Marx, Weber, Michels, Parsons and others, as well as such themes as political socialization, the structure of power in industrial society, political culture, political participation and public opinion.

**POLST 255.6
Political Inquiry
1&2(3L)**

An introduction to selected methods of investigating political behaviour and political institutions. Examples are drawn from several subfields of the discipline to illustrate the interplay of theory and observation, and problems of measurement and research design.

**POLST 260.6
International Relations
1&2(3L)**

An analysis of the major features of international relations - the nature and evolution of international actors, the issues and ideas which motivate them, and their behaviour in world politics.

**POLST 305.3
Provincial Politics
1/2(3L)**

A study of the institutions and processes of Canadian provincial political systems with particular attention paid to the Saskatchewan experience.

**POLST 306.3
Local Government
1/2(3L)**

A study of various aspects of local government. The historical part will trace the development of local government in Canada and the profound influence of the British and American systems of local government. The analytical part will be concerned with such topics as structure, machinery, functions and the operation of local government.

**POLST 307.3
Topics in Canadian Politics
1/2(3L)**

Prerequisite(s): 6 credit units of 100-level POLST or 30 credit units of university courses.

Examines issues of major contemporary concern in Canadian politics such as women and politics, environment and politics, and current constitutional issues. The content of the course may be expected to alter from year to year according to the significance of political events and issues. The precise content of the course taught in any particular term will be made known to students in advance of registration deadlines.

**POLST 320.6
Comparative Public Policy: Canada
and the United States
1&2(3L)**

Prerequisite(s): 6 credit units of 100-level POLST.

Focuses on the study of public policy. Emphasis will be placed on policy formulation and implementation at the federal level of government in Canada and the United States and the role of the state in the policy process.

**POLST 327.6
Public Policy Analysis
1&2(3L)**

Prerequisite(s): 6 credit units of 100-level POLST.

Familiarizes students with various approaches, perspectives and techniques employed in public policy analysis, as well as theories and models commonly employed in the analysis of various stages and facets of the policy process.

**POLST 331.3
Classical Political Thought
1/2(3L)**

Prerequisite(s): POLST 235 or PHIL 262.

An intensive examination of ancient Greek and Roman political thought. Particular attention will be paid to Socrates, Plato, Aristotle and Stoicism.

**POLST 333.3
Medieval and Renaissance Political
Thought
1/2(3L)**

Prerequisite(s): POLST 235 or PHIL 262.

An intensive examination of political thought from the classical Christian period through the Renaissance and to the Reformation. Particular attention will be paid to such thinkers as Augustine, Aquinas, Machiavelli, Luther and Calvin and to such themes as constitutionalism, state, power, and the individual.

**POLST 335.6
Modern Political Thought
1&2(3L)**

Prerequisite(s): POLST 235 or PHIL 262.

A study of developments in political thought from the 17th century onwards, with special attention to those thinkers who have made important and enduring contributions to our understanding of politics and to the political and social philosophies of the modern era.

POLST 336.3
Contemporary Political Thought
1/2(3L)

Prerequisite(s): POLST 235 or PHIL 262.
An examination of important theoretical trends in contemporary political thought, including existentialism, communitarianism, neoliberalism, neoconservatism and feminism.

POLST 337.3
Topics in Political Thought
1/2(3L)

Prerequisite(s): POLST 235 or 335 or PHIL 262.

Focuses on a thinker, issue, or approach in political philosophy not covered in the other political philosophy courses offered by the department.

POLST 343.3
Politics of Change, Society in Transition: Post-Soviet Ukraine
1/2(3L)

Prerequisite(s): One of POLST 241, 243, HIST 324 (310) or UKR 211.

Examines the process of institution-building, the character of domestic and foreign political innovation, and the results of social and economic policy initiation which have marked the period of transition in post-Soviet Ukraine.

POLST 346.3
Topics in the Politics of the Developing World
1/2(3L)

Prerequisite(s): POLST 246 or 247; or permission of the department.

Designed to provide students with an intensive analysis of current topics in the politics of developing areas: leadership and ideology; democracy and re-democratization; women and development; sustainable development; and ethnic relations and politics.

POLST 348.6
Topics in Comparative Politics
1&2(3L)

Analysis of politics in selected countries or areas. Emphasis will be on political culture, political structures and political processes.

POLST 351.3
Women and Political Power
1/2(3L)

Introduces students to the study of women and politics by focusing on how women are represented in the western political tradition and how feminist analyses challenge this tradition. Exploring several central political ideas within the context of the women's movement helps to explain how and why women have sought specific political objectives such as the franchise and reproductive rights.

POLST 352.3
Women, Political Participation and Public Policy
1/2(3L)

Introduces students to the study of women and politics by focusing on women's participation in formal democratic processes. Specific investigation of the feminization of political institutions and women's public policy activism helps students to understand how and why women participate in politics.

POLST 354.6
Political Processes
1&2(3L)

An analysis of political parties, pressure groups, public opinion, public opinion polls, and voting behaviour.

POLST 356.3
Methods of Election
1/2(3L)

Examines the principal methods of election in use in the democratic world. Included are plurality methods (Canada), the alternative vote (Australia) and proportional representation (Germany, Ireland). Proposals for electoral reform in Canada are considered.

POLST 358.3
Political Leadership in Western Democracies
1/2(3L)

A comparative analysis of political leadership in Great Britain, the United States, and Canada, with particular reference to the selection of party leaders and the characteristics of those who lead political parties.

POLST 360.6
International Conflict
1&2(3L)

Prerequisite(s): POLST 260.

An analysis of theories of the causes, dynamics, and termination of international conflict. Included are analyses of international strategy and diplomacy, contemporary international conflicts, and conflict resolution.

POLST 362.3
International Political Economy
1/2(3L)

Prerequisite(s): 12 credit units POLST or 60 credit units of university courses.

Examines the impact of political actors and institutions on the world economy. Students are introduced to the major theoretical approaches in the study of the politics of global economic relations, so that they can better understand such issues as the debt crisis, trade disputes, the emergence of NAFTA and the expansion of the European Union.

POLST 363.3
Contemporary Regional Organizations in Europe and North America
1/2(3L)

Prerequisite(s): POLST 240 or 260.

Examines the phenomenon of regional organizations in its various economic, security and political manifestations in the North Atlantic area, by focusing on such organizations as the European Union, NAFTA, NATO, WEU, the Council of Europe, and OSCE.

POLST 365.6
Canadian Foreign Policy
1&2(3S)

Devoted to the study of Canada's foreign policy since 1945. A series of case studies examines the character of and the factors shaping foreign policy.

POLST 367.3
International Organizations
1/2(3L)

Prerequisite(s): POLST 260.

Focuses primarily on international governmental organizations, both universal and regional. Examines the role and impact of selected institutions such as the League of Nations, the United Nations, and the European Union. Specifically, assesses to what extent these organizations have been effective in promoting international peace and security, and global economic development.

POLST 368.3
Ideology and American Foreign Policy
1/2(3L)

Prerequisite(s): POLST 260.

An examination of American foreign policy since 1945, with an emphasis on how American ideological perspectives affect U.S. political, economic and military objectives and strategies. Major attention is given to imagery in the post-Cold War period and to U.S. efforts to promote democracy and human rights.

POLST 369.3
Chinese Politics and Foreign Policy
1/2(3L)

Prerequisite(s): POLST 260.

An analysis of Chinese politics and foreign policy since 1949. This course examines China's efforts to develop socialism internally while coping with an international environment which often threatens its security and socialist objectives.

POLST 382.6 Saskatchewan Legislative Internship
3P

The study of Saskatchewan's provincial political institutions, politics, public policies, public management and public administration through a combination of direct observations, directed readings, and research and analysis.

POLST 385.3
Selected Topics in Central American Politics
2(3L)

Part of the La Antigua, Guatemala Study Term Abroad. An analysis of the contemporary politics of Central America. Topics include democracy, development, integration, inter-American relations, and political process. Includes guest lecturers from the region and field trips within Guatemala.

SEMINAR COURSES

These courses are open to third and fourth year students majoring in political studies, aboriginal public administration, public administration or international studies. Other qualified students may be admitted with permission of the Head of the Department. However, because of the need to ensure that enrollments in these courses are compatible with their designation as seminars, all students must obtain permission in writing from the department before their registration can be completed.

POLST 404.3
The Canadian Constitution and Federalism
1/2(3S)

An examination of Canada's constitution and its federal system.

POLST 405.3
Canada's Institutions and Representation
1/2(3S)

An examination of parliamentary institutions and representation.

POLST 424.3
New Public Management in Canada
1/2(3S)

The course is designed to help students understand the current discourses on contemporary and future directions in governance with a special emphasis on public management, public administration, and public policy. Toward that end, it provides an analysis of recent developments in the management of various public programs, services, and human and financial resources of the federal, provincial, territorial, and municipal governments in Canada.

POLST 425.3
Governance and Management Partnerships
1/2(3S)

This is an analysis of public management in the inter-governmental and inter-organizational spheres. The objective is to orient students to the reality that much public management today occurs in the inter-governmental and inter-organizational spheres and that in addition to governmental organizations it also involves non-governmental organizations both in the not-for profit and the for profit sectors.

POLST 430.3
Contemporary Political Philosophers
1/2(3S)

This course is designed to introduce students to some twentieth century political philosophers. The course examines how these political philosophers responded to the conflicts of the twentieth century and how they perceive present and future political developments.

POLST 431.3
Contemporary Problems in Political Philosophy
1/2(3S)

This course is designed to introduce students to some contemporary problems in political philosophy.

POLST 434.3
Politics and Literature
1/2(3S)

The purpose of this course is to introduce students to the role of literature and art in general in the appreciation and understanding of the nature and dilemmas of politics. We will begin with an examination of some theoretical issues concerning the place of politics in literature and the place of literature in politics and then apply the principles we have learned from this section of the course to an examination of some classic works.

**POLST 436.3
Imagining the Political
1/2(3S)**

Prerequisite(s): POLST 434.

The purpose of this course is to continue the study of the nature of politics and the problems and dilemmas political actors face through modern and contemporary works of literature and art. Attention will also be given to a consideration of the plight of some marginalized groups in our society.

**POLST 438.6
Rights and Community
1&2(3S)**

Prerequisite(s): Fourth-year standing in Political Studies; POLST 235.

A survey of major theoretical issues underlying questions of rights in the context of contemporary politics, with special attention to Canada. A central concern will be questions of conflict between individual liberty and community concerns and interests.

**POLST 439.3
The Development of Democratic Thought
1/2(3S)**

A seminar on the eighteenth- and nineteenth-century foundations of democratic thought, with emphasis on the ideas of liberty, equality and majority rule.

**POLST 441.3
Themes and Issues in Democratic Thought
1/2(3S)**

Discussion of a selection of topics of current interest, including group-specific rights, direct democracy and more participatory politics.

**POLST 442.3
Comparative Government Bureaucracy
1/2(3S)**

Prerequisites: One of POLST 220, 240, 320.

The course examines major issues relevant to the study of bureaucracy in the modern state. The focus is on the functioning of government bureaucracies in Western Europe and North America.

**POLST 443.3
Comparative Public Policy
1/2(3S)**

Prerequisites: One of POLST 220, 240, 320.

The course examines public policy from a comparative perspective by focusing on policy making and policy content in Western Europe and North America. It will examine such policy areas as education, health, economic policy, taxation, income maintenance, environment, housing and urban planning.

**POLST 444.6
Seminar in Comparative Politics
1&2(3S)**

Prerequisite(s): 6 credit units from POLST 240, 241, 242, 243, 246, 247.

An analysis of selected issues in comparative politics, or the politics of a selected region or area of the world.

**POLST 446.3
Democracy in Africa: Challenges and Prospects
1/2(3S)**

Since 1989 a number of African countries have embraced re-democratization, that is, the introduction of competitive multi-party political systems. Severe setbacks have arisen with military interventions or from autocratic rulers manipulating their instruments of power to block a successful transition. This course examines the prospects for democracy in Africa.

**POLST 447.3
Ethnicity and Governance in Selected Third World Countries
1/2(3S)**

Examines ethnicity and politics in the Third World. The theoretical and conceptual basis of ethnicity will be considered at the outset. Comparisons between country settings will focus on the role of political and ethnic leadership, party formation and competition, policy formation and implementation, electoral competition, government formation and multi-ethnic relations.

**POLST 452.6
Seminar in Political Sociology
1&2(3S)**

A critical examination of the theoretical literature on various topics in political sociology. The topics will include: political elites, bureaucracy, the economic role of the state, political culture, industrial democracy. Both classical works (e.g., those by Weber and Marx) and contemporary works (e.g., such writers as Habermas, Giddens, Dahl, and Offe) will be examined.

**POLST 460.3
International Ethical Thought
1/2(3S)**

Prerequisite(s): POLST 260.

This course explores major traditions and ideas concerning the nature and role of ethics in international relations, including, among others, Realism, Marxism, Feminism and Liberalism, as well as the Natural Rights, Just War, and International Law traditions.

**POLST 462.3
Ethical Issues in International Relations
1/2(3S)**

Prerequisite(s): POLST 460.

This course examines specific issues in contemporary international politics about which difficult ethical choices have been made or about which there is ethical controversy—including international intervention (both politically-motivated and humanitarian), nuclear strategy, terrorism, sanctions, and promotion of international human rights.

**POLST 464.6
Seminar in International Relations
1&2(3S)**

Prerequisite(s): POLST 260.

An analysis of selected issues in international relations.

**POLST 465.3
Nationalism and the International System
1/2(3S)**

Prerequisite(s): POLST 260.

An introduction to nationalism as a political force in the formation and development of the modern international system, highlighting how as a global movement and cultural system it has shaped international society while paradoxically threatening its security. The future and continuing relevance of nationalism in the post-modern world is also considered.

**POLST 466.3
Ethnic Conflict and Democracy
1/2(3S)**

Prerequisite(s): POLST 260.

An introduction to the problem of ethnic conflict in international society, highlighting the process of ethnic mobilization as a response to inequality. Emphasis will be placed on the special challenges facing democracy in ethnically divided societies and the various legal, political and moral issues associated with the international community's response in resolving ethnopolitical conflicts and disputes.

**POLST 470.3
Post-Cold War Conflict and Cooperation
1/2(3S)**

Prerequisite(s): POLST 260.

With the Cold War receding into the pages of history and with the dawning of a new millennium, new opportunities have emerged to reduce the possibility of global warfare. However, with trends such as the spread of weapons technology and the emergence of new forms of terrorism and conflict, the prospects for the realization of this "peace dividend" are brought into question. The objective of this course is to examine political developments across the various regions and to assess their implications for cooperation or conflict in the international system.

**POLST 471.3
Globalization and its Challenges
1/2(3S)**

Prerequisite(s): POLST 260.

In this course, the objective is to examine the impact of globalization not just on the economy, but on groups such as labour, women, and the poor and on various transnational processes such as environmental degradation, refugee flows and the spread of ethnic conflicts.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

- POLST 398.3 1/2(3S)
- POLST 399.6 1&2(3S)
- POLST 498.3 1/2(3S)
- POLST 499.6 1&2(3S)

GRADUATE COURSES

Department of Political Studies, College of Graduate Studies & Research

Course offerings will vary from year to year, depending upon student demand.

**POLST 767.6
Ethical Issues in International Relations
1&2(25S)**

Examines the nature and limits of ethical values in international relations and explores the responsibilities and difficulties of states, statesmen and individuals in seeking to act ethically in an anarchic international system. Ethical issues involved in war, nuclear strategy, humanitarian intervention, sanctions and the promotion of democracy and human rights are examined.

**POLST 801.3
Federalism
1/2(3S)**

A seminar on theories of federalism with particular emphasis on the Canadian experience. In addition to the Confederation Debates, some of the authors to be studied include K. C. Wheare, William Livingston, Alan Cairns, and D. V. Smiley.

**POLST 802.3
Canadian Government and Politics
1/2(3S)**

An examination of the structure and operation of Canadian political institutions.

**POLST 805.3
Provincial Government and Politics
1/2(3L)**

A comparative examination of the political process, political institutions and political cultures of Canada's provinces.

**POLST 809.3
Canadian Constitution & Politics
1/2(3S)**

Topics include the Constitutional Act, Canadian Charter of Rights and Freedoms, Canada Elections Act, and intergovernmental relations.

**POLST 818.6
Readings in Contemporary Political Studies
1/2(3L)**

Required of all graduate students. Issues and themes are drawn from the current scholarly literature in political studies. Conduct of the seminar is shared among members of staff, according to topic. Several meetings and assignments are devoted to thesis preparation.

**POLST 820.3
Canadian Public Administration
1/2(3L)**

The Canadian public service within the Canadian political system. The structure and operations of the civil service will be related to policy formulation and implementation. Several topics of concentration include: public accountability, representative bureaucracy, the ministry system, the budgetary process, public corporations and federal-provincial administrative relations.

**POLST 832.3
Selected Topics in Political Thought I
1(3L)**

Problems in the philosophy of social science are examined.

**POLST 833.3
Selected Topics in Political Thought II
2(3L)**

Selected topics in political philosophy are examined: natural rights, the public interest, justice, obligation, freedom and others.

**POLST 835.6
Nationalism
1&2(3L)**

The philosophical origins, the characteristics, and the implications of nationalism; criticisms, and traditions of criticism, of nationalist doctrine; nationalism as a movement and its relations with other movements such as socialism. Also the manifestations of nationalism, and the characteristics of nationhood, in specific countries, notably Canada, and also France, Germany, other parts of Europe, the English-speaking world (including the two parts of Ireland), and some of the nation-states of Asia, Africa, and the Caribbean, emphasis depending on the interests of individual students.

**POLST 838.6
Rights and Community
1&2(3S)**

A survey of major theoretical issues underlying questions of rights in the context of contemporary politics, with special attention to Canada.

**POLST 839.3
Contemporary Political Philosophy
1/2(3S)**

Examines several of the approaches and thinkers of the rebirth of political philosophy in the last half of the 20th century. In particular, how some of these contemporary political theorists analyze central topics in political philosophy: justice, obligations, rights, public interests, power, state, society, history, etc.

**POLST 840.3
Comparative Government
Bureaucracy
1/2(3S)**

An examination of the functioning and implications of bureaucracy in selected industrialized states.

**POLST 841.3
Comparative Public Policy
1/2(3S)**

An examination of public policy and policy making in selected industrialized states.

**POLST 849.3
Theory and Method in Comparative
Government and Politics
1/2(3S)**

Investigates the range of theories that are being used in contemporary political science to examine political phenomena from a cross-national perspective. Also examines the methodological issues that arise in approaching the study of politics and government in this way.

**POLST 852.6
Selected Topics in Political
Sociology
1&2(3L)**

A discussion of metaphors, models and "systems" within the context of modern ideologies, socio-political doctrines and political "cultures."

**POLST 853.3
Political Leadership in Anglo-
Western Democracies
1/2(3L)**

A comparative analysis of political leadership in Great Britain, the United States, and Canada, with particular reference to the selection of party leaders and the characteristics of those who lead political parties.

**POLST 854.3
Political Parties and Voting Behaviour
1(3L)**

An examination of political parties, party systems and electoral behaviour.

**POLST 859.3
Political Sociology
1/2(3S)**

Prerequisite(s): There are no formal prerequisites, but students should have completed previous coursework in political philosophy or social and political thought. Intensive examination of the work of one or more contemporary sociologists or social theorists, or of the debate concerning one or more key concepts in the literature of political sociology.

**POLST 865.3
Decision-Making Theory and
Canadian Foreign Policy
1/2(3.5S)**

Explores some of the more advanced theoretical literature in the area of foreign policy decision-making and adapts it for use in the study of Canadian foreign policy. Employs a variety of analytical models, e.g., "rational actor", "national interest", "role analysis", "operational codes", etc. to examine specific cases of Canadian foreign policy decision-making in the post World War II period.

**POLST 866.3
The Canadian Foreign Policy Process
1/2(3.5L)**

Explores in depth various aspects of the Canadian foreign policy process. The focus will be on the executive (Prime Minister and Cabinet) the bureaucracy (The Department of External Affairs, and the relevant central agencies) and the legislature (Parliament and its committees) and the role played within the policy process of special interests, the media and the provinces.

**POLST 869.3
Graduate Seminar in International
Relations: Theories in International
Relations
1/2(2.5S)**

Surveys and assesses major theories of international relations and examines the assumptions and methodological approaches which underlie them. Both classical and modern scientific theories are examined in terms of internal consistency, relationship to date, and over-all utility for the describing, explaining and predicting of international behaviour.

**POLST 898.3/899.6
Special Topics
1/2(3L)**

Reading, essays, and discussion in an approved special field.

**POLST 990
Seminar**

Papers and discussions on topics in political studies. Graduate students are required to attend and take part in these meetings. Every graduate student is expected to present a seminar on their thesis topic before receiving the graduate degree.

**POLST 994
Research**

Students writing a Master's thesis must register for this course.

**PRODUCTION AND
OPERATIONS MANAGEMENT**

Department of Finance and Management Science, College of Commerce

See also Production and Operations Management under Commerce courses in this section of the *Calendar*.

**POM 400.6
Honours Seminar in Production and
Operations Management
1&2(3S)**

Prerequisite(s): Admission to the Honours program.

Directed readings and individual research in the area of production and operations management. The major course requirement involves the preparation of an Honours research paper under the supervision of one or more faculty (Honours Advisors) in the particular area of specialization. The resulting Honours paper is normally presented at a department seminar.

PSYCHIATRY

Department of Psychiatry, College of Medicine

These courses are restricted to students enrolled in the College of Medicine.

**PSIAT 501.6
Psychiatry
PD (6 weeks)**

A Clinical Clerkship in which the student will gain experience with inpatient, outpatient, and emergency consultations. Students will be expected to take part in the night call rotation as well. There is a seminar series.

GRADUATE COURSES

Department of Psychiatry, College of Graduate Studies & Research

**PSIAT 850.6
Neuropsychiatry
1&2(3L/S)**

Prerequisite(s): PHCOL 350, BIOCH 220 (or 203); or equivalents or permission of the instructor.

Offered in alternate years and is designed for graduate students and residents in Psychiatry. Comprised of: (1) a series of basic lectures covering many areas of neuroscience such as neurochemistry, neurophysiology, neuropharmacology, neuroendocrinology, etc. especially as

applied to psychiatry and neurology, (2) a series of lectures on the diagnosis and treatment of a variety of psychiatric and neurological disorders combined with a case presentation, and (3) a series of student presentations in a seminar/discussion format on the biological theories of the mechanisms underlying selected psychiatric and neurological disorders.

**PSIAT 898.3/899.6
Special Topics
1/2(3R/T), 1&2(3R/T)**

Prerequisite(s): PSIAT 850.

Study in selected areas of neuroscience or neuropsychiatry may be undertaken by advanced students with the permission of the department head. Consists of supervised readings and discussion leading to the preparation of a term paper by the student.

**PSIAT 990
Seminar**

Students are required each year to attend the departmental seminar series and to present one formal seminar on an assigned topic and one informal seminar on their research activities.

**PSIAT 994
Research**

Students registered in a Master's thesis program must register in this course.

**PSIAT 996
Research**

Students registered in a Ph.D. thesis program must register in this course.

PSYCHOLOGY

Department of Psychology, College of Arts & Science

All students in PSY 110 will be asked to participate in research studies conducted within the Department of Psychology. Research participation is desirable both as a means of advancing the science of human behaviour and as a means of providing the introductory student with first-hand educational experience in psychological research.

ST. THOMAS MORE COLLEGE

Sections of some courses in this department are taught by faculty in the corresponding department of St. Thomas More College. These course sections are designated in the *Registration Guide* by section numbers prefixed with the letter "M."

PSY 110 is the prerequisite for all Psychology courses.

**PSY 110.6
General Psychology
1&2(3L)**

An introduction to the scientific study of human behaviour, dealing with the essential problems of psychology, the methods of investigation, and the advances which have been made in some of the major fields such

as motivation, perception, learning and personality.

**PSY 211.3
Introduction to Psychological Tests and Measurements
1/2(3L)**

Principles of psychological measurement including: sources of test information; quantitative concepts with applications to test construction; factors influencing test performance; uses and misuses of tests in counselling, educational and industrial settings.

**PSY 213.3
Child Psychology
1/2(3L)**

An examination of the biological, cognitive and personal growth of children from conception to early adolescence. Topics include: perceptual learning, sensory abilities, motivation, parent-child relationships, vocalization and communication, intelligence, creativity, development of social relationships and personality. Materials will be drawn from human and comparative psychology.

**PSY 214.3
Adolescent Psychology
1/2(3L)**

This course will deal with the social problems characteristic of this age group. Attention will be given to problems in the study of adolescence, physical growth patterns, to development of interpersonal relationships in adolescence, cognitive growth and adolescent educational problems. Material will be drawn from human and comparative psychology.

**PSY 216.3
Psychology of Aging
1/2(3L)**

The study of normal psychological development through maturity to old age. Topics include: consideration of critical issues of research methods; problems of adjustment of the aged such as physical decline, retirement, aloneness, disengagement; the needs and care of the aged, antecedents of successful aging; the psychology of dying and death; theories of aging.

**PSY 222.3
Personality
1/2(3L)**

A systematic survey of basic principles of motivation, learning, conflict and problem solving as applied to the study of personality. Major problem areas and contemporary theories of personality are reviewed.

**PSY 223.3
Abnormal Psychology
2(3L)**

Prerequisite(s): PSY 222 recommended.
Major patterns of abnormal behaviour are reviewed and studied with respect to origins, course and treatment. The focus is upon understanding abnormal behaviour with an integrated knowledge of basic principles of general psychology.

**PSY 224.3
Introduction to Culture and Psychology
1/2 (3L)**

A survey of theory and research on cultural issues in psychology, including developmental, cognitive and social psychology. By the end of the course, the student will be able to demonstrate an understanding of fundamental concepts and theoretical perspectives pertinent to the study of culture and human behaviour, knowledge of the findings of relevant classic and contemporary empirical studies, and familiarity with methodological issues pertaining to research in this area.

**PSY 225.3 (Formerly PSY 221.6)
Group Dynamics and Intergroup Relations
1/2 (3L)**

This course is designed to give the student a broad overview of an important area of social psychology. Group dynamics and interpersonal relations will be covered through lectures, readings, and assignments on topics such as group decision-making, leadership, conflict and cooperation, collective behaviour, prejudice, and minority-majority relations.

**PSY 226.3 (Formerly PSY 221.6)
Intrapersonal and Interpersonal Processes
1/2 (3L)**

This course focuses on social psychological phenomena internal to the individual, such as social cognition, emotion, the self, and attitudes. It also considers issues associated with relations between individuals, such as altruism, aggression, attraction and social influence. Students who wish to pursue further studies in social psychology are encouraged to take both this course and PSY 225.3 (Group Dynamics and Intergroup Relations).

**PSY 230.3
The Psychology of Criminal Behaviour
1/2(3L)**

Prerequisite(s): PSY 222, 223, 257 recommended.

The application of psychological theories to the understanding of criminal behaviour. An overview of assessment and treatment issues as these apply to specific types of criminals (e.g., sexual offenders, psychopathic offenders) will also be provided.

**PSY 232.3
Research Methods in the Psychological Sciences: An Introduction
1/2 (3L-1P)**

An introduction to research methods, design, and statistical analyses used in psychology. The course will examine the origin of psychological theories, the use of experimental and non-experimental methods, various research designs, and hypothesis testing using various types of statistical procedures. The course will involve both lecture and lab.

Note: This is a required course for all three-year degree students. Students who have taken PSY 233.3, 234.3, 235.3 or equivalent cannot take PSY 232.3 for credit.

Similarly, students who have taken PSY 232.3 cannot take PSY 235.3 for credit. In addition, students who take PSY 232 instead of PSY 235 will not be admitted into the advanced 300-level project courses (i.e., PSY 316.3, 318.3, 324.3, 326.3, 328.3, 344.3, 348.3 356.3).

**PSY 233.3
Statistical Methods in the Behavioural Sciences
1/2(3L)**

The role of statistics in research including: statistical concepts and models, estimation, simple tests of significance, linear regression and correlation, and introduction to analysis of variance.

Note: For further detail on statistics, see Statistics Courses in the Index section of the *Calendar*.

**PSY 234.3
Statistical Methods in the Behavioural Sciences
1/2(3L)**

Prerequisite(s): PSY 233.

A continuation of the role of statistics in research covering methods of analysis of variance including cross-classification, introduction to multiple comparisons, factorials, multiple regression and covariance.

Note: Students who have taken other courses in statistics, either from Arts and Science or from another college, should consult "Regulations for Introductory Courses in Statistics" for information on statistics course equivalencies. See Statistics Courses in the Index section of the *Calendar*.

**PSY 235.3 (Formerly 372.6)
Research Methods and Design in Psychology
1/2 (3L-1P)**

Prerequisite: PSY 233.3, and 234.3 (234 may be taken concurrently).

This course introduces students to both experimental and non-experimental research methods and designs used in psychology. The course focuses on the interplay between research questions, theory, the selection of appropriate research procedures and resulting conclusions. The laboratory component will consist of training in the utilization of statistical software.

Note: Students with credit in PSY 235.3 cannot take PSY 232.3 for credit.

**PSY 242.3
Physiological Psychology
1/2(3L)**

An introduction to the language, techniques, concepts and general subject matter of physiological psychology. Topics will include: sensory processes, motor systems, the brain, memory and learning. This core knowledge will be useful to those wanting an exposure to the biological study of behaviour, or to those wanting a primer for more advanced study.

**PSY 243.3 (Formerly 244)
Evolutionary Psychology
1/2(3L)**

The human mind and the behaviour that emerges as products of the mind, will be considered as the outcome of a large number of adaptations brought about by natural selection. The possibility of, and

evidence for, a universal human nature at the level of evolved psychological mechanisms will be presented. The evolutionary significance of altruism, cooperation and conflict, morality, deceit, self-deception and illness will be examined.

Note: Students with credit for PSY 244.3 cannot take this course for credit.

**PSY 246.3
Introduction to Human Neuropsychology
1/2(3L)**

An introduction to research and theory on the topic of human brain function. Topics include research techniques and strategies, developmental neuropsychology, localization and lateralization of function, recovery of function, and deficits associated with lesions of the neocortex.

**PSY 252.3
Perceptual Processes
1/2(3L)**

A brief survey of the principles that have emerged from the empirical investigation of perception, with special reference to vision and hearing. An examination of the factors which underlie such fundamental features of behaviour as the perception of objects and of three-dimensional space and the maintenance of perceptual constancy.

**PSY 253.3
Introduction to Cognitive Psychology
1/2(3L)**

An introduction to research and theory on the topic of human cognitive functioning. The course will explore how humans attend to, encode and remember their experiences, communicate using both written and spoken language, and engage in higher order processes such as reasoning, problem solving, and decision making.

**PSY 255.3
Human Memory
1/2(3L)**

An introduction to research and theory on the structures and processes involved in human memory. Topics include the evidence for distinct sensory, short-term, and long-term memory stores, the format of representation in memory, and the determinants of effective memory performance.

**PSY 256.3
Psychology of Language
1/2(3L)**

This course explores and evaluates theories and research involving the psychology of language. Broadly defined, the topics will include visual and auditory language issues regarding: encoding, representation, comprehension, production, acquisition, biological foundations, dysfunction, and cultural influences. Students will also learn about current research projects, and the preparation of research papers.

**PSY 257.3
Clinical and Counselling Psychology
1/2(3L)**

Review of the relevant topics in clinical and counselling psychology including psycho diagnostic testing, and the major approaches to therapeutic change.

**PSY 258.3
Industrial Psychology
1/2(3L)**

The application of psychological theory and methods to problems and processes concerning the human aspects of industry. Important areas include: selection, training, attitudes and motivation, psychological factors in organizational work, and consumer behaviour.

**PSY 260.3
Community Psychology
1/2(3L)**

Prerequisite(s): Twelve 200-level credit units in psychology. Students are advised to take at least one of PSY 222 or 223 prior to taking PSY 360.

Research on the effects of the physical and social environments on human behaviour, and the design and evaluation of changes which might promote adaptive behaviour.

**PSY 315.3 (Formerly PSY 314.6)
Advanced Developmental
Psychology: Social and Emotional
Development
1(2L-2P)**

Prerequisites: 12 credit units of 200-level Psychology including 3 credit units from PSY 213.3, 214.3, and 216.3; and one of PSY 232.3 or 235.3.

This course will introduce students to the theoretical foundations, research designs, and methods used to study social and emotional development. The course will involve lectures and a lab component. In the lab component, students will participate in a collaborative research project.

Note: Students who take PSY 232.3 rather than PSY 235.3 will not be allowed to register for PSY 316.3.

**PSY 316.3 (Formerly PSY 314.6)
Research in Social and Emotional
Development
2 (3P)**

Prerequisites: PSY 233.3, 234.3, 235.3, and 315.3.

In this course, students will develop independent research projects designed to answer an empirical question in the domain of social and emotional development. Each student will be responsible (either individually or as a member of a small group) for designing a study, testing participants, analyzing data, and writing up a research report.

**PSY 317.3 (Formerly PSY 314.6)
Advanced Developmental
Psychology: Cognitive Development
1 (2L-2P)**

Prerequisites: 12 credit units of 200-level psychology, including one of PSY 213.3, 214.3, and 216.3; and one of PSY 232.3 or 235.3.

This course will introduce students to an in-depth study of major content areas, theoretical orientations, and research methods which are necessary to advance knowledge in the study of cognitive development. Students will learn about the special features of the cognitive developmental perspective and will conduct research projects in the laboratory component of the course.

Note: Students who take PSY 232.3 rather than 235.3 will not be allowed to register for PSY 318.3.

**PSY 318.3 (Formerly PSY 314.6)
Research in Cognitive Development
2 (3P)**

Prerequisites: PSY 233.3, 234.3, 235.3, and 317.3.

In this course, students will develop independent research projects designed to answer an empirical question in the domain of cognitive development. Each student will be responsible (either individually or as a member of a small group) for designing a study, testing participants, analyzing data, and writing up a research report.

**PSY 323.3
Narrative Study of Lives and Social
Practices
1(2L-2P)**

Prerequisites: 12 credit units of 200-level psychology, including 3 credit units from Group 1, and either PSY 232.3 or PSY 235.3.

In a narrative approach, a coherent and illuminating story, informed by psychological knowledge, is constructed to understand individual lives and social practices. Social constructionist and qualitative methods are introduced. Topics include: psychological biographies, case studies, dialogical construction of the self, rhetorical and discourse analyses of everyday social life.

Note: Students who take PSY 232.3 rather than PSY 235.3 will not be allowed to register for PSY 324.3.

**PSY 324.3
Research in the Narrative Study of
Lives and Social Practices
2(3P)**

Prerequisites: PSY 233.3, 234.3, 235.3 and 323.3.

A research course linked to Narrative Study of Lives and Social Practices (PSY 323.3). Students participate in the design, data collection, analysis and write up of one group research project in narrative psychology. Qualitative methods are used, including: interviews, naturalistic observation and participant observation, discourse analysis of everyday talk, grounded theory analysis.

**PSY 325.3 (Formerly PSY 321.6)
Advanced Social Psychology
1(2L-2P)**

Prerequisites: 12 credit units of 200-level psychology, including one of PSY 225.3 or 226.3, and one of PSY 232.3 or 235.3.

Students will be introduced to the variety of research methods used in social psychology through one or more content areas determined by the instructor (e.g., prejudice, discrimination, attitude change, interpersonal conflict, impression management, aggression, media violence, prosocial behaviour, conformity, group processes, attraction, applying social psychology to the law, workplace, health problems, etc.).

Note: Students who take PSY 232.3 rather than 235.3 will not be allowed to register for PSY 326.3 or 328.3.

**PSY 326.3 (Formerly PSY 321.6)
Interview, Surveys, and
Observational Methods in Social
Psychology
2(3P)**

Prerequisites: PSY 233.3, 234.3, 235.3 and 325.3.

Focuses on interview, survey, and/or observational methods. Topics covered will include survey construction, sampling, structured and unstructured research interviews, and qualitative and quantitative data analysis. Students will conduct a full-semester individual research project using one or more of the methods presented.

**PSY 328.3 (Formerly PSY 321.6)
Research in Experimental Methods
in Social Psychology
2(3P)**

Prerequisites: PSY 233.3, 234.3, 235.3 and 325.3.

This course is designed to give students a practical understanding of experimental methods commonly used in social psychology. The course will cover experimental research design; the collection, coding and analysis of experimental data; the ethical and administrative issues that arise when conducting experiments of this kind; and how to interpret and report the results of such experiments.

**PSY 343.3 (Formerly PSY 342.6)
Laboratory in Behavioural
Neuroscience
1(2L-2P)**

Prerequisites: 12 credit units of 200-level psychology, including one of PSY 242.3, 243.3, or 246.3 and one of PSY 232.3 or 235.3.

This course is an introduction to the techniques, theory and methods in behavioural neuroscience. The focus will be upon brain and behaviour and the techniques used to study nervous system function. The lab and seminar components will include a series of experiments to be carried out by the students.

Note: Students who take PSY 232.3 rather than 235.3 will not be allowed to register for PSY 344.3.

**PSY 344.3 (Formerly PSY 342.6)
Research in Behavioural
Neuroscience
2(3P)**

Prerequisites: PSY 233.3, 234.3, 235.3, and 343.3.

This course is a laboratory course in behavioural neuroscience. The course will provide students with the opportunity to conceptualize, design, and implement an independent research project in the area of behavioural neuroscience. Emphasis will be placed on brain and behaviour and the techniques used to study nervous system function.

**PSY 347.3 (Formerly PSY 346.6)
Advanced Human Neuropsychology
1(2L-2P)**

Prerequisites: 12 credit units of 200-level psychology, including one of PSY 242.3 or 246.3 and one of PSY 232.3 or 235.3.

This course will introduce the student to the theoretical and methodological issues in the study of the structure and function of the human neocortex. The course will

involve lectures, seminars, and a lab component in which a series of experiments will be carried out by the students.

Note: Students who take PSY 232.3 rather than 235.3 will not be allowed to register in PSY 348.3.

**PSY 348.3 (Formerly PSY 346.6)
Research in Human Neuropsychology
2(3P)**

Prerequisites: PSY 233.3, 234.3, 235.3, and 347.3.

A laboratory course concerned with the concepts, theories, and experimental investigation of the structures and functions of the human neocortex. The course will provide the students with the opportunity to conceptualize, design, and implement an independent research project to answer an empirical question related to experimental neuropsychology.

**PSY 353.3 (Formerly PSY 352.6)
Advanced Cognitive Science: Basic
Cognitive and Perceptual Processes
1(2L-2P)**

Prerequisites: 12 credit units of 200-level psychology including one of PSY 252.3, 253.3, or 256.3 and one of PSY 232.3 or 235.3.

This lecture and laboratory course exposes students to current theory and research methods in the study of cognitive and perceptual processes. Students will be expected to review, design, conduct, analyse and report a series of class experiments. Topics may include perception, sensory memory, attention, pattern recognition and word recognition.

Note: Students who take PSY 232.3 rather than 235.3 will not be allowed to register in PSY 356.3.

**PSY 355.3 (Formerly PSY 352.6)
Advanced Cognitive Science:
Memory, Thinking, and Problem
Solving
1(2L-2P)**

Prerequisites: 12 credit units of 200-level psychology, including one of PSY 253.3, 255.3, or 256.3 and one of PSY 232.3 or 235.3.

This lecture and laboratory course exposes students to current theory and research methods in higher-order cognitive processes. Students will be expected to review, design, conduct, analyse and report a series of class experiments. Topics may include human memory, reasoning, thinking, and problem solving.

Note: Students who take PSY 232.3 rather than 235.3 will not be allowed to register for 356.3.

**PSY 356.3 (Formerly PSY 352.6)
Research in Cognitive Science:
Independent Research Projects
2(3P)**

Prerequisites: PSY 233.3, 234.3, 235.3 and one of PSY 353.3 or 355.3.

In this laboratory course students develop independent experimental research projects in some area of cognitive science. Each student (either individually or as a member of a small group) is responsible for designing a study, testing participants, analysing the data, and writing up a research report following American

Psychological Association style conventions.

PSY 380.3 Issues in Traditional Health and Healing 1/2 (1L-2S)

Prerequisites: PSY 110 and 12 credit units at the 200-level in Psychology, Native Studies, Anthropology or Sociology.

The intent of this course is to expose the student to critical scholarly perspectives on contemporary issues in traditional or alternative approaches to health and healing. While there will be a focus on the Aboriginal peoples of North America, there will also be exposure to traditional forms of healing from other parts of the world.

Students require permission of the department to take 400-level courses. Additional prerequisites are listed. Not all 400-level courses will be available in any given year.

PSY 401.3 (Formerly PSY 400.6) Historical and Philosophical Foundations of Psychology 1/2 (3S)

Prerequisite: permission of the department and 6 credit units of 300-level psychology.

The major theories of psychology will be presented in such a way that the student can evaluate their strengths and weaknesses with respect to their application in fields such as education and psychotherapy.

PSY 418.3 Advanced Seminar in Developmental Psychology 1/2(3S)

Prerequisites: permission of the department and 6 credit units from PSY 213.3, 214.3, 216.3, 315.3, 317.3.

This course is an advanced seminar focussed on theoretical and empirical analyses of human development. A set of original research articles covering diverse areas of developmental psychology (e.g., behavioural genetics, development and psychopathology, cognitive development, social development, aging) will be assigned, read, and discussed by the class.

PSY 425.3 (Formerly PSY 420.6) Advanced Group Dynamics and Intergroup Relations 1/2(3S)

Prerequisites: permission of the department and PSY 225.3 and one of PSY 226.3, 323.3 or 325.3.

This course is designed to give the student an in-depth knowledge of the social psychology of group dynamics and intergroup relations. Therefore, the course covers both the major theories and research in this area. Students will study important contemporary primary source articles. They will also give in-class presentations on selected topic areas. The course is designed to allow students to study this topic at an advanced level.

PSY 426.3 (Formerly PSY 420.6) Advanced Seminar in Intrapersonal and Interpersonal Processes 1/2(3S)

Prerequisites: permission of the

department and PSY 226.3 and one of 225.3, 323.3 or 325.3.

This advanced seminar examines social psychological phenomena internal to the individual, such as social cognition, emotion, the self, and attitudes and attitude change. It also considers issues associated with relations between individuals, such as altruism, aggression, affiliation and social influence processes.

PSY 444.3 (Formerly PSY 440.6) Advanced Seminar in the Evolutionary Basis of Behaviour 1/2 (3S)

Prerequisites: permission of the department and 6 credit units from PSY 242.3, 243.3, 246.3, 343.3, 347.3.

Using a seminar format, this course will examine the possibility that human behaviours such as mate selection, parenting, and cooperation are still influenced by our evolutionary past.

The primary objective of the course is to demonstrate the value of integrating evolutionary and psychological theory when explaining individual and group behaviour.

PSY 448.3 (Formerly PSY 440.6) Advanced Seminar in the Neural Basis of Behaviour 1/2 (3S)

Prerequisites: permission of the department and 6 credit units from PSY 242.3, 246.3, 343.3, 347.3.

Using a seminar format, this course will survey some recent research into the biological basis of behaviour. Topics covered will include the neural basis of sensory/perceptual processes, motor systems, memory, language, emotion, attention, consciousness, or other topics of interest to the faculty and students.

PSY 456.3 Advanced Seminar in Cognitive Science 1/2 (3S)

Prerequisites: permission of the department and 6 credit units from PSY 252.3, 253.3, 255.3, 256.3, 353.3, 355.3.

This course is an advanced seminar focussed on theoretical and experimental analyses of human perception, cognition, and performance. A set of original research articles covering diverse areas of cognitive science (e.g., basic perception, memory, language comprehension, human reasoning) will be assigned, read, and discussed by the class.

PSY 472.6 Honours Thesis 1&2(1L-2P)

Prerequisite(s): Restricted to honours students or with written permission of the department.

Students will carry out a major project under the supervision of a faculty member, and report the project in the form of an honours thesis. The project will usually involve empirical research.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these

courses should contact the department for more information.

- PSY 298.3 1/2(3S)
- PSY 299.6 1&2(3S)
- PSY 398.3 1/2(3S)
- PSY 399.6 1&2(3S)
- PSY 498.3 1/2(3S)
- PSY 499.6 1&2(3S)

GRADUATE COURSES

Department of Psychology, College of Graduate Studies & Research

PSY 800.3 Graduate Seminar in Psychology 1/2(3S)

An advanced survey of theory and research in basic areas of psychology: learning and motivation, perception and cognition, physiological and comparative, personality and social, and developmental psychology.

PSY 805.3 Statistics I 1/2(3L)

Selected topics in inferential statistics, including an introduction to analysis of variance. Required of all graduate students.

PSY 806.3 Statistics II 1/2(3L)

Continuation of 805 with focus on more advanced analysis of variance designs. Required of all Ph.D. students.

PSY 807.3 Statistics III 1/2(3L)

Continuation of 806. Focus on multivariate methods, correlation and regression, and factor analysis. Introduction to computer techniques for statistical analysis.

PSY 808.3 Advanced Psychometric Methods 1/2(3L)

Measurement theory and some of its applications, e.g., test construction, in-depth treatment of reliability and validity. Theoretical considerations involved in the measurement of abilities, intelligence and personality.

PSY 810.3 Methods of Applied Social Research 1&2(3S)

An advanced coverage of the theory and practice of social research in applied settings. A practicum component involving supervised field research projects will be the major focus of the course.

PSY 811.3 Program Evaluation 1&2(3S)

An intensive analysis of the processes of developing and evaluating human service programs. Major topics will include the articulation of program goals, the development of measures, evaluation designs, and statistical techniques.

PSY 815.6 Psychological Assessment 1&2(2L-2S-3P)

A basic course in techniques for assessment of ability and personality, including interviewing skills, general

intelligence testing, special ability testing, and personality appraisal.

PSY 816.3 Topics in Psychological Assessment 1/2(3S)

A brief but intensive seminar on selected topics in psychological assessment. Topics may include: neuropsychological assessment, forensic assessment, projective personality assessment, vocational assessment, assessment of psychological components of physical illnesses, behavioral assessment.

PSY 820.3 Organizational Psychology and Organizational Development 1/2(3S)

Advanced coverage of theoretical concepts and practical methodology relating to the study and change of human service organizations. Students participate in field experiences involving research and/or consultation with such organizations.

PSY 821.3 Community Psychology I 1/2(3S)

Current theory, research and methodology in the area of community psychology. Environmental determinants of behavioral change, preventative procedures, epidemiology and process research will be emphasized. Practicum experiences in community settings are incorporated into the course.

PSY 830.3 Advanced Seminar in Personality 1/2(3S)

An intensive study of current theory and research in the area of personality.

PSY 831.3 Advanced Behavioral Pathology 1/2(3S)

An intensive study of current theory and research in the field of behavioral pathology. Behavioral disorders in children, adults and the aged will be covered in this seminar.

PSY 832.3 Advanced Seminar in Social Psychology 1/2(3S)

Current theories in research and social psychology. Emphasis is on applied theories of social behaviour and the application of current theories to applied problems.

PSY 833.3 Advanced Seminar in Environmental Psychology 1/2(3S)

The consequences of environmental manipulation on human behaviour. Basic psychological processes in relation to the environment, current methods in environmental research, individual needs in the organization and planning of environments and cultural designs will be studied.

**PSY 834.3
Advanced Seminar in Group
Processes
1/2(3S)**

A critical review of theory, research and practice related to group behaviour, including factors influencing communication, decision-making, group cohesiveness and productivity.

**PSY 835.3
Advanced Seminar in Developmental
Psychology
1/2(3S)**

A critical review of theory, research and methodologies related to development psychology. The entire developmental sequence from the pre-natal period to infancy, childhood, adulthood, and senescence is reviewed.

**PSY 836.3
Advanced Seminar in Motivation
1/2(3S)**

A critical review of theories and research in the area of motivation. Data from human and infrahuman experiments are studied.

**PSY 837.3
Advanced Seminar in Learning
1/2(3S)**

A study of experimental data on basic learning processes and the theoretical significance of such data.

**PSY 838.3
Advanced Seminar in
Psycholinguistics
1/2(3S)**

A critical discussion of research problems to which psycholinguistic theories and techniques can be applied. Data on language acquisition, language competence, bilingualism and linguistic aspects of motivation learning and cognition are reviewed.

**PSY 839.3
Advanced Seminar in Perception and
Cognitive Processes
1/2(3S)**

A review of empirical and theoretical materials relating to perception, concept formation, problem-solving, creative thinking, and decision-making.

**PSY 842.3
Advanced Seminar in Physiological
Psychology
1/2(3S)**

A critical review of basic research in physiological psychology. Research in classical and current problems is studied with a focus on neural coding, sensory, motor, motivational, affective, reward systems as well as learning and memory.

**PSY 843.3
Advanced Seminar in Comparative
Psychology
1/2(3S)**

An intensive study of the comparative method and its application to behaviour with an emphasis upon infrahuman organisms. Research on innate behaviour, early experience, learning, motivation and physiological processes is reviewed from a comparative viewpoint.

**PSY 844.3
Advanced Seminar in Behavioral
Pharmacology
1/2(3S)**

A critical review of research in the field of behavioral pharmacology. Deals with the main principles of drug action, behaviourally active drugs, and behavioral mechanisms of drug action. The experimental analysis of problems associated with drug dependence, drug-induced changes in the electrical activity of the brain, behavioral toxicology and the psychopharmacology of affective disorders is emphasized.

**PSY 846.3
Advanced Seminar in Human
Neuropsychology
1/2(1L&2S)**

Prerequisite(s): Registration in a psychology graduate program.

A critical review of theory, research and methodology in human neuropsychology. Using a combination of lectures and seminars, students will be exposed to the recent literature on topics such as brain localization and lateralization of functions, brain damage and recovery, and the neuropsychology of "higher-order" functions.

**PSY 850.3
Topics in Psychological Therapy I
1/2(3S)**

Principles and procedures of individual psychological therapy and counselling. One or two specific systems of psychotherapy are studied.

**PSY 852.3
Topics in Psychological Therapy II
1/2(3S)**

An intensive study of principles and procedures of individual psychological therapy and counselling. One or two specific systems of psychotherapy are studied.

**PSY 860.6
Seminar on Professional Skills
1&2(3S)**

This seminar is designed to develop the professional competence of clinical-community Ph.D. students through the study and discussion of professional issues and problems in clinical and community practice. Both theoretical and practical issues will be considered as they arise from ongoing practicum activities. Required of all Clinical Ph.D. students.

**PSY 862.3
Seminar on the Identity of Applied
Social Psychology
1/2(3S)**

An advanced seminar on the unique and evolving identity of the field of applied social psychology as an interdisciplinary effort by professional scholar-practitioners. Issues to be discussed include those of basic definition, relationship to experimental social psychology, graduate training, the requirements of professional practice including ethics and standards, and the future of the field.

**PSY 863.3
Seminar on Professional
Consultation
1/2(3S)**

An advanced seminar designed to develop the professional competence of Ph.D.

students in the area of consultation in applied social psychology. Study and discussion of strategies and issues in research, program, organizational and community consultation activities in field settings.

**PSY 890.6
Clinical Research Seminar
1&2(3S)**

A seminar on contemporary issues in clinical and community research. Theoretical, methodological and ethical issues in the areas of assessment, therapy, personality, abnormal and community research will be emphasized. There is particular focus upon students' and faculty research interests. Required of all Clinical Ph.D. students.

**PSY 891.6
Applied Social Research Seminar
1&2(3S)**

An advanced seminar designed to extend the research competence of Ph.D. students in the areas of utilization and social policy formation. Advanced field research designs and methods of data analysis will be discussed in relation to ongoing research activities in practicum settings.

**PSY 898.3/899.6
Special Topics
1/2(R), 1&2(R)**

The student pursues a program of readings in selected research topics under the supervision of individual faculty members.

**PSY 900
Directed Research in Psychology**

Individualized research projects under the supervision of faculty members.

**PSY 994
Research**

Completion of original research and writing of Master's thesis.

**PSY 996
Research**

Completion of original research and writing of Ph.D. dissertation.

PRACTICAL COURSES/INTERNSHIP

These courses are taken in conjunction with other courses in the clinical-community and applied social programs. They permit students to obtain a closely supervised experience in the application to clinical skills or applied research methods.

**PSY 902
Practicum in Professional
Psychology
1&2(3P-2C)**

Consists of supervised field work in professional psychology under the direction of individual faculty members.

**PSY 903
Clerkship in Professional Psychology
1/2(36C)**

The student is engaged for one term as an intern in a clinical community setting. Supervision is provided by departmental faculty members and psychologists in field settings.

**PSY 904
Internship in Professional
Psychology
1,2&3(31C)**

The student is engaged for one year as an intern in a clinical community setting. Supervision is provided by psychologists in field settings.

**PSY 911
Ethical and Professional Issues in
Clinical Psychology
1/2(1.5S)**

Prerequisite(s): GSR 985 (taken concurrently).

Introduction to ethical principles, codes, and processes for ethical decision-making with a special focus on clinical psychology. Readings and discussion on confidentiality, informed consent, dual relationships, duties to clients, business practices, and other professional issues. Equips students to resolve ethical dilemmas in practice and in licenture examinations.

**REGIONAL AND URBAN
DEVELOPMENT**

Regional and Urban Development, College of Arts & Science

**RUD 413.0
Practicum in Planning
(P)**

Prerequisite(s): GEOG 247, 346 and permission of the department.

An applied course that provides students with professional experience and the ability to critique urban, rural, regional or community planning standards and procedures. The course must include a work program consisting of 40 hours approved by the Practicum Supervisor. *Note:* Graduation in the program is based on the overall average only.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in this course should contact the Program Coordinator, Administrative Committee, or visit www.usask.ca/rud/ for more information.

RUD 398.3 1/2(3S)
RUD 399.6 1&2(3S)
RUD 498.3 1/2(3S)
RUD 499.6 1&2(3S)

REHABILITATION MEDICINE

Department of Rehabilitation Medicine, College of Graduate Studies & Research

**REHMD 801.6
Rehabilitation Medicine
1&2(3S/C)**

Prerequisite(s): Degree in Engineering, Medicine, Nursing, Physical or Occupational Therapy, or Science.

Provides clinical orientation to the student's experimental work and his/her study of the basic sciences. Includes participation in clinical presentations, seminars, reading and discussions of the fundamental processes involved in disabling diseases for which rehabilitation methods are required. Students

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are required to prepare and present a seminar in depth. An oral examination and a written report (at least 5,000 words) will be mandatory.

REHMD 802.6 Fundamentals of Electromyography 1&2(2L)

Prerequisite(s): Degree in Physical or Occupational Therapy, Medicine or Science. Study and observation of fundamental basis and clinical and research applications of electromyography and nerve conduction studies.

RELIGIOUS STUDIES

Department of Religious Studies, College of Arts & Science

RELST 110.6 World Religions 1&2(3L)

A critical survey of the history, sources and chief characteristics of major world religions, including, in particular, Hinduism, Buddhism, Taoism, Islam, Judaism and Christianity. Particular attention will be given to an investigation of the phenomenon called religion, and to the relationships between religion and culture.

All 200-level courses have as a prerequisite RELST 110 or 30 credit units at the university.

RELST 211.3 Hindu Religious Tradition 1/2(3L)

A study of the historical, social, doctrinal, and ritual aspects of Hinduism.

RELST 214.3 An Introduction to the Philosophies of India 1/2(3L)

An introduction to the philosophical thought of India with special reference to early speculations on the nature of human reality, God, world, and human destiny.

RELST 217.3 Buddhist Religious Tradition 1/2(3L)

An examination of Buddhist religious history with emphasis on its socio-cultural dimensions. Topics include early Buddhism and its Indian evolution; culture contact and the spread of Buddhism to South East Asia, China, Japan and Tibet; Buddhism and change in modern Asia and the West.

RELST 218.3 Developments in Buddhist Thought 1/2(3L)

An introduction to Buddhist philosophy and the development of its major schools of religious thought – Theravada, Mahayana and Vajrayana. Buddhist views of the interdependence of morality, knowledge and liberation will be studied in their historical and contemporary contexts.

RELST 220.3 (Formerly 325) Women in Western Religious Traditions 1/2(3L)

Study of women in major Western Religious Traditions: influence of conceptual systems

and language; women's embodiment and religion, feminine spirituality, women's contributions to Western faiths, and feminine aspects of divinity.

Note: Students with credit for RELST 325 may not take this course for credit.

RELST 221.3 Introduction to Christianity 1/2(3L)

A systematic examination of the foundations of belief in the major divisions of Christianity - Orthodoxy, Protestantism, and Catholicism - with emphasis on various theories of revelation, of religious authority, and of public worship.

RELST 223.3 Fundamental Teachings of Christianity 1/2(3L)

A study of the fundamental teachings of Christianity - the Trinity, creation, redemption, and sanctification - with an examination of the forms of worship and theories about morality, both individual and social, as these are found in the various sectors of contemporary Christianity.

RELST 224.3 Christian Ritual and Worship: An Introduction 1/2(3L)

Examines Christian ritual and worship through historical and comparative approaches. Special emphasis will be placed on the role of the rites of initiation and Eucharist. Students will examine the contemporary practices of Orthodox, Catholic and Protestant Churches.

RELST 225.3 Perspectives on Jesus 1/2(3L)

The findings of modern biblical and historical research will be applied to the figure of Jesus as he is presented in the New Testament and to the development of doctrine about him in Christianity.

RELST 227.3 Introduction to Judaism 1/2(3L)

An introduction to basic Jewish ideas, beliefs, and practices from the biblical times to the present.

RELST 228.3 Jewish Religious Thought 1/2(3L)

An introduction to Jewish theology and the treatment of the concepts of God, Torah, and Israel by major Jewish philosophers.

RELST 230.3 Taoism: Mysticism, Metaphysics and Magic 1/2(3L)

A survey of the Taoist tradition in its various dimensions: mystical (meditation, inner alchemy, sexuality and immortality), metaphysical (the philosophy of the 'Way'), and magical (the magic powers of the Taoist priesthood). All these aspects will be studied in their own terms and related to the overall cultural heritage of China.

RELST 231.3 Confucianism: Continuity and Change 1/2(3L)

Explores the significance and changing role of the Confucian tradition: its ancient roots in China, historical elaboration and expansion, and relevance for personal and social vision today.

RELST 234.3 Chinese Folk Religion and Folk Culture 1/2(3L)

Study of the religious world view inherent in the folklore tradition of China and of folk religious concepts and practices including mythology, divination, magic, and communal worship.

RELST 240.3 Introduction to Islam 1/2(3L)

A study of Islam focusing on the religion's origin and development, its basic beliefs and practices, and its influence in defining Moslem cultures.

RELST 253.3 Introduction to the Old Testament 1/2 (3L)

A basic introduction to the Old Testament, focussing on the historical, literary and theological characteristics of the various writings. Scholarly methods by which they are studied, and their relationship to the history of Israel will also be examined.

Note: Students with credit for RELST 250 may not take this course for credit.

RELST 254.3 Introduction to the New Testament 1/2 (3L)

A basic introduction to the New Testament, focussing on the historical, literary and theological characteristics of the various writings. Scholarly methods by which they are studied, and their relationship to Christianity will also be examined.

Note: Students with credit for RELST 252 may not take this course for credit.

RELST 280.3 Methodologies and Approaches to the Study of Religion 1/2(3L)

An introduction to theories and approaches in the academic study of religion. Origins and development of social scientific, historical, phenomenological and comparative approaches will be examined.

RELST 282.3 Religious Perspectives on Death and Dying 1/2(3L)

Examines how various world religions have understood the significance of death and dying.

RELST 283.3 Comparative Mysticism 1/2(3L)

An examination of the theoretical and methodological issues involved in a systematic study of mysticism in world religions. Topics include the nature, theories, and typologies of mysticism, and techniques of mystical experience.

RELST 284.3 Religion and Non-Violence 1/2(3L)

An examination of the ideal of non-violence according to the scriptures of the world-religions, with examples of its historical and contemporary application in Asia and the West.

RELST 285.3 (Formerly 381) Religion and Ethnicity 1/2(3L)

A systematic exploration of the contribution of religion to ethnic identification and ethnic community organization.

Note: Students with credit for RELST 381 cannot take this course for credit.

RELST 314.3 Contemporary Catholic Thought 1/2(3L)

Prerequisite(s): A 200-level religious studies course in Christianity.

An analysis of contemporary Catholic thought with emphasis on the Second Vatican Council (1962-1965) and its effects. Themes include: identity of and membership in the church; liturgical renewal; post-conciliar forms of spirituality and community; social doctrine; moral issues.

RELST 315.3 Eastern Christian Thought in the First Millennium 1/2(3L)

Prerequisite(s): A 200-level religious studies course in Christianity.

A survey of individuals and movements that shaped and influenced the development of Eastern Christianity during the first millennium.

RELST 316.3 Eastern Christianity in the 2nd Millennium 1/2(3L)

Prerequisite(s): A 200-level religious studies course in Christianity.

A survey of individuals and movements that shaped Eastern Christianity from the conversion of the Slavs to the present-day diaspora.

RELST 320.3 Contemporary Protestant Thought 1/2(3L)

Prerequisite(s): A 200-level religious studies course in Christianity.

Analysis of 20th-century Protestant Thought. Special emphasis given to problems of religious knowledge and to the stance of Christianity in the modern world. The relationship of Catholic thought is included.

RELST 321.3 Feminist Theologies 1/2(3L)

Prerequisite(s): A 200-level religious studies course in Christianity or WGST 200.

An overview of feminist theological perspectives, both as critiques of traditional culture and theology and as constructions of new visions and ways of religious life.

RELST 326.3 Christian Thought in Art 1/2(3L)

Prerequisite(s): A 200-level religious

studies course in Christianity.

Introduction to iconography in Christianity with emphasis on exploring the relationship between uniquely Christian themes and art as a bearer of meaning. Attention will be given to the historical and doctrinal developments relating to icons and their use in worship and reflection in early Christianity and the Eastern Christian Churches.

Note: Students with credit for RELST 226 cannot take this course for credit.

RELST 328.3
Jewish-Christian Relations in Historical Perspective
1/2(3L)

Prerequisite(s): A 200-level religious studies course in Judaism or Christianity. Christianity emerged out of Judaism, and this course examines the relationships that have existed between the two religions through the ages. Both Christian and Jewish sources will be examined to develop a critical perspective on this important aspect of Western religious heritage.

RELST 329.3
Studies in the Bhagavad Gita
1/2(3L)

Prerequisite(s): RELST 211 or 214; or permission of the department.

Students will be reading the Bhagavad Gita in translation along with some of the commentarial literature to acquire a critical understanding of fundamental philosophical assumptions of Hinduism. Primary approach being textual study, the course will also attempt to draw upon the Hindu hermeneutical tools in search for the meaning structures in the Bhagavad Gita.

RELST 330.3
Taoist Philosophy
1/2(3L)

Prerequisite(s): RELST 230 or permission of the department.

Intensive reading and discussion of major texts (in translation) of Taoism: Tao Te Ching, Chuang-tzu, Lieh-tzu, and Huai-nan-tzu. Compares Taoism and some other major schools of Chinese thought: Confucianism and Buddhism.

RELST 331.3
Neo-Confucian Thought
1/2(3L)

Prerequisite(s): RELST 231 or permission of the department.

Reading and discussion of major Neo-Confucian texts in translation. The focus will be on the interpretive communities in which Confucian classics were understood as living spiritual wisdom in dialogue with Buddhists and Taoists.

RELST 341.3
The Bodhisattva Doctrine in Buddhism
1/2(3S)

Prerequisite(s): A 200-level religious studies course in Buddhism or permission of the department.

The Buddhist view of human perfection is epitomized in the concept of the bodhisattva. This course explores the origins and development of the bodhisattva ideal and examines its role in Asian cultural history.

RELST 342.3
Tibetan Buddhism
1/2(3L)

Prerequisite(s): RELST 217 or 218; or permission of the department.

A survey of Tibetan Buddhism with a focus on its socio-cultural dimensions. Topics include: characteristic features of Tibetan culture and Tantric Buddhism, the role of the monastery in religion and society, Buddhist folk religious traditions, and the condition of Tibetan Buddhism in the modern era.

RELST 350.3
Canonical Formation of the Hebrew Bible
1/2 (3L)

Prerequisite: RELST 253.3 or permission of the department.

This course investigates the Hebrew Bible through a critical reconstruction of the process of its canonization as sacred scripture in the post-exilic period. Study of the history of the period is followed by consideration of the narratives, the prophetic and miscellaneous books ("Writings") viewed as the product of the interaction of a variety of socio-religious interests.

Note: Students with credit for RELST 250 may not take this course for credit.

RELST 351.3
Origins and Literary Character of the Hebrew Bible
1/2(3L)

Prerequisite: RELST 350.3.

This course surveys the pre-exilic literary origins of the Hebrew Bible in the context of the monarchical regimes under which the literature was produced. The course will also consider the literary impact of the Hebrew Bible on the modern reader using for comparison other traditions of literature old and new.

Note: Students with credit for RELST 250 may not take this course for credit.

RELST 352.3
Christian Origins and the New Testament I
1/2(3L)

Prerequisite: RELST 254.3 or permission of the department.

An investigation of Christianity in its formative period (30-100 CE), on the basis of a critical examination of the New Testament and other relevant material. The focus in this course is on the activity of Jesus, the origin of the Christian movement, and the first century Jewish context.

Note: Students with credit for RELST 252 may not take this course for credit.

RELST 354.3
Christian Origins and the New Testament II
1/2 (3L)

Prerequisite: RELST 352.3.

A further examination of the formative period of Christianity (30-100 CE) based on in-depth study of the New Testament and other related literature. The focus in this course is on the development of the Christian movement, and on resultant issues of unity and diversity.

Note: Students with credit for RELST 252 may not take this course for credit.

RELST 356.3
The Synoptic Gospels
1/2(3L)

Prerequisite(s): RELST 252.

A study of the Gospels of Matthew, Mark and Luke, and of the Synoptic tradition that lies behind them. Attention will be paid to the literary relationships among the Gospels; the written and oral traditions that they incorporate; and the literary and theological characteristics of each Gospel.

RELST 359.3
Women and the Bible
1/2 (3L)

Prerequisite: 200-level RELST Area A (Western Religions) course or 200-level WGST course.

This course examines historical, social and theological aspects of women's relationship to the Old and New Testament, the portrayal of women in biblical texts, the interpretation of biblical texts about women, biblical attributions of gender to the divine, the history of women as biblical interpreters, and feminist hermeneutics.

RELST 361.3
Rabbinic Literature
1/2(3L)

Prerequisite(s): RELST 227 or 228.

A study of post-Biblical Jewish religious literature, including legal, ethical and theological material. Emphasis will be placed on both methodology and content, with illustrative texts read in English.

RELST 363.3
Early Christian Literature
1/2(3L)

Prerequisite(s): 3 credit units in Christianity.

A study of extra-biblical Christian writings up to A.D. 150 with emphasis on the beliefs of early Christianity, its relationship with paganism and Judaism, and the development of its internal organizational structures.

Note: Students with credit for RELST 309 or 311 may not take this course for credit.

RELST 365.3
The Bible and Film
1/2(3L)

Prerequisite(s): RELST 110 or 253 or 254 or ENG 298, or 30 credit units.

An examination of the uses of the Bible in film, including epic films, contemporary retellings of biblical stories, and the use of biblical themes and motifs in cinema, uncovering the many ways in which biblical-theological themes shape, and are shaped by, contemporary culture.

RELST 390.3
Readings in Eastern Religions
1/2(3S)

Prerequisite(s): 6 credit units in Eastern Religious Traditions at the 200-level; or permission of the department.

A reading course in primary writings in Eastern religious traditions such as the Bhagavad gita, Brahmasutrabhasya, Tao Te Ching, or the Analects of Confucius.

RELST 391.3
Readings in Western Religions
1/2(3S)

Prerequisite(s): 6 credit units in Western Religious Traditions at the 200-level; or

permission of the department.

Exposes the student to primary source materials. Emphasis is placed on individual study and research.

RELST 392.3
Readings in Themes and Methods of Religious Studies
1/2(3S)

Prerequisite(s): At least 6 credit units at the 200-level in religious studies; or permission of the department.

A reading course dealing with methodological issues or comparative themes in religious studies.

400-level seminars are Restricted to students with at least 3 credit units at the 300 level or a minimum of 18 credit units in religious studies or permission of the department.

RELST 411.3
Seminar in Religion and Literature
1/2(3S)

An advanced seminar in religious literature, chosen from either Eastern or Western religious traditions. Student presentations and discussions are emphasized.

RELST 412.3
Seminar in Religion and Culture
1/2(3S)

A critical examination of religious ideas, beliefs, and practices in varied cultural contexts.

RELST 413.3
Seminar in Religious Thought
1/2(3S)

An advanced seminar in contemporary religious thought focusing on an important theme such as the nature of religious belief, the problem of suffering and evil, or religious pluralism.

RELST 414.3
Seminar in Biblical Literature
1/2(3L)

Prerequisite: RELST 350.3 and 351.3; or RELST 352.3 and 354.3; or permission of the department.

An advanced seminar in a selected portion or aspect of the literature of either the Hebrew Bible or the New Testament. Student presentations and discussions are emphasized.

RELST 423.3
Comparative Approaches to the Study of Religion
1/2(3S)

A survey of contemporary theories and methods in the comparative study of religion. Issues and problems in the application of the comparative approach will be examined. Selected readings in major figures in the discipline, including Canadian contributors.

RELST 425.3
Honours Paper/Colloquium
1&2(1S)

Prerequisite(s): 3 credit units at the 300-level or completion of 18 credit units in religious studies or permission of the department.

Students will carry out a major project under the supervision of a faculty member

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and present the completed project in the form of a major paper and departmental colloquium.

Note: Required for Honours in Religious Studies.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

RELST 298.3 1/2(3S)
RELST 299.6 1&2(3S)
RELST 398.3 1/2(3S)
RELST 399.6 1&2(3S)
RELST 498.3 1/2(3S)
RELST 499.6 1&2(3S)

REMOTE SENSING

Department of Electrical Engineering,
College of Graduate Studies & Research

RE SE 780.3 Methodology and Applications of Remote Sensing Technology 1/2(3L-3P)

An interdisciplinary course dealing with the evaluation and application of various sensor systems (photographic, spectral scanners, microwave radiometer, radar image, and radio reflectometer) to specific resource orientated programs such as soil survey, land use, crop and landform identification, and aspects of pollution detection and monitoring. Data processing and presentation of remote sensing data are discussed with particular reference to pattern recognition techniques, feature selection and numerical display of data.

RUSSIAN

Department of Languages and Linguistics,
College of Arts & Science

Students registered in any of the language courses (114.3, 117.3, 214.3, 217.3, 314.3, 317.3) should plan to attend weekly oral tutorials as scheduled in the *Registration Guide*. A multi-media laboratory is also available on a library basis.

Students with a background in Russian (including those who speak the language at home) will not be allowed to take Russian language courses for credit until they have contacted the department to arrange for an interview / placement test prior to registering.

RUSS 114.3 (Formerly 115) Elementary Russian I 1/2(4L-1T)

This course develops elementary proficiency in speaking, reading, understanding, and writing Russian. Basic grammatical structures, sound patterns, spelling and vocabulary will be studied. Students will be introduced to Russian life and culture, politics, geography, and society.

Note: Students who have completed Russian 30 in the past five years may not take this course for credit. Students who have a background in Russian or have taken any other Russian courses, must present themselves to the Department to write a placement test. Native speakers of Russian are not allowed to register in this course. Students with credit for RUSS 115 may not take this course for credit.

RUSS 117.3 (Formerly 115) Elementary Russian II 1/2(4L-1T)

Prerequisite(s): RUSS 114 or permission of the department.

This course is a continuation of RUSS 114. It develops elementary proficiency in speaking, reading, understanding, and writing Russian. Basic grammatical structures, sound patterns, spelling and vocabulary will be studied. Students will be introduced to Russian life and culture, politics, geography, and society. Students will develop the ability to understand spoken Russian and respond to it within certain everyday topics.

Note: Students who have completed Russian 30 in the past five years may not take this course for credit. Students who have a background in Russian or have taken any other Russian courses, must present themselves to the Department to write a placement test. Native speakers of Russian are not allowed to register in this course. Students with credit for RUSS 115 may not take this course for credit.

RUSS 205.3 A Survey of Russian Literature in English Translation 1/2(3L)

Prerequisite(s): Completion of 30 credit units at the university.

Surveys the development of Russian literature from its origins to the present. Students will read representative works in English translation of the more important genres in each period of Russian literature.

Note: This course cannot be used to fulfill the language requirement. It may be used to fulfill the humanities requirement or as an elective under Requirement 7.

RUSS 210.3 Russian Civilization (in English) 1/2(3L)

Prerequisite(s): Completion of 30 credit units at the university.

A survey of the material, spiritual and intellectual culture of Russia.

Note: This course cannot be used to fulfill the language requirement. It may be used to fulfill the humanities requirements or as an elective under Requirement 7.

RUSS 214.3 (Formerly 215) Intermediate Russian I 1/2(3L-1T)

Prerequisite(s): RUSS 114 and 117 or permission of the department.

This course develops the basic syntactic, morphological, lexical, and phonetic structure of modern Russian, by combining a study of the essentials of grammar with classroom practice in conversation and translation, and through selected readings.

Note: Native speakers of Russian are not allowed to register in this course. Students

with credit for RUSS 215 may not take this course for credit.

RUSS 216.3 Russian Prose 1/2(3L)

Prerequisite(s): RUSS 214, 217.

A survey of Russian prose from the beginnings to the present.

RUSS 217.3 (Formerly 215) Intermediate Russian II 1/2(3L-1T)

Prerequisite(s): RUSS 214 or permission of the department.

This course is a continuation of RUSS 214. Emphasis is placed on improving oral and written communication skills. Selected readings will be used to further develop the essentials of grammar and build vocabulary.

Note: Native speakers of Russian are not allowed to register in this course. Students with credit for RUSS 215 may not take this course for credit.

RUSS 226.3 Russian Poetry 1/2(3L)

Prerequisite(s): RUSS 214, 217.

The development of Russian poetry from its beginnings to the present. Works of representative poets in each period are studied.

RUSS 235.3 Turgenev (in English) 1/2(3L)

Prerequisite(s): Completion of 30 credit units at the university.

Introduces the novels, stories and plays of Ivan Turgenev and examines his place in Russian and world literature. Representative works will be read in English translation.

Note: Students with credit for RUSS 236 may not take this course for credit. This course cannot be used to fulfill the language requirement. It may be used to fulfill the humanities requirements or as an elective under Requirement 7.

RUSS 261.0 Revolution and Dissidence: Studies in Protest Literature 1/2(1T)

Prerequisite(s): RUSS 214, 217 (may be taken concurrently).

A tutorial accompanying LIT 261.3.

RUSS 262.0 Exiles and Emigrés: Studies in Expatriation 1/2(1T)

Prerequisite(s): RUSS 214, 217 (may be taken concurrently).

A tutorial accompanying LIT 262.3.

RUSS 263.0 Heroines, Anti-Heroines and Gender Definition in Literature 1/2(1T)

Prerequisite(s): RUSS 214, 217 (may be taken concurrently).

A tutorial accompanying LIT 263.3.

RUSS 264.0 Mephisto and Faust: Knowledge, Power, Damnation and Redemption 1/2(1T)

Prerequisite(s): RUSS 214, 217 (may be

taken concurrently).

A tutorial accompanying LIT 264.3.

RUSS 300.3 Studies in Russian Authors 1/2(3L)

Prerequisite(s): RUSS 314 and 317 taken previously or concurrently.

One Russian author will be studied, such as Gogol, Turgenev, Dostoevsky, Tolstoy, Pasternak, Solzhenitsyn, Pushkin.

RUSS 314.3 (Formerly 315) Advanced Russian I 1/2(3L-1T)

Prerequisite(s): RUSS 214, 217 or permission of the department.

This course will enable students to function independently within complete immersion in the Russian environment, conducting independent research and study literature in the language. It will continue developing oral and written proficiency. The cultural component will prepare students for complete immersion in the Russian milieu.

Note: Students with credit for RUSS 315 may not take this course for credit.

RUSS 317.3 (Formerly 315) Advanced Russian II 1/2(3L-1T)

Prerequisite(s): RUSS 314 or permission of the department.

This course is a continuation of RUSS 314. It will concentrate on dramatic improvement of all four language skills: listening, speaking, reading, and writing. Students will be able to work independently with Russian texts, and will be able to sustain advanced conversation on a wide range of subjects.

Note: Students with credit for RUSS 315 may not take this course for credit.

RUSS 350.3 Studies in Russian Literary Periods 1/2(3L)

Prerequisite(s): RUSS 314, 317 (may be taken concurrently).

A single period of Russian literature will be studied, chosen from Classicism, Romanticism (the Golden Age), Realism, Symbolism, the Soviet period.

RUSS 405.3 Topics in Russian Literature 1/2(3L)

Prerequisite(s): RUSS 314, 317 (may be taken concurrently).

A special topic will be studied, such as Russian drama, Russian criticism, development of the short story, émigré literature, dissident literature.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

RUSS 298.3 1/2(3S)
RUSS 299.6 1&2(3S)
RUSS 398.3 1/2(3S)
RUSS 399.6 1&2(3S)
RUSS 498.3 1/2(3S)
RUSS 499.6 1&2(3S)

SANSKRIT

Department of Religious Studies, College of Arts & Science

**SANSK 101.6
Introduction to Sanskrit
1&2(3L)**

An elementary course in classical Sanskrit language. Topics include phonology and nagari script; major features of morphology, grammar and syntax; translation practice and reading in narrative literature.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

SANSK 398.3 1/2(3S)
SANSK 399.6 1&2(3S)

SCHOOL EXPERIENCES

EXTENDED PRACTICUM

Extended Practicum students are placed with teachers holding a Saskatchewan Teaching Certificate in a school using the provincial curriculum and organized under the Education Act. Students studying abroad are placed in a situation approved by the Centre for School-Based Experiences.

**EX PR 401.6
Practicum for Certification**

Prerequisite(s): ST TC 103 or 303 or 304, or ST TC 420 or 427 in the B.Ed./B.Mus.(Mus.Ed.) program. Students must have earned a CWA of a least 60% in their External and in their professional Education courses. Students in the secondary option must also have a minimum average of 60% in each of Teaching Areas I and II. Students must have completed the first three years of the program.

The practicum for certification involves eight weeks, full-time, of teaching experience.

Note: Permission to take this course is granted only by the Student Affairs and Academic Standards Committee. Students may receive credit for only one of EX PR 400, 401 and 402.

**EX PR 402.12
Extended Practicum**

Prerequisite(s): ST TC 103 or 303 or 304 or ST TC 420 or 427 in the B.Ed./B.Mus.(Mus.Ed.) Program. Students must have earned a CWA of a least 60% in their External and in their Education courses. Students in the secondary option must also have a minimum average of 60% in each of Teaching Areas I and II. Students must have completed the first three years of the program.

The Extended Practicum involves one term, full-time, of teaching experience.

Note: Students may receive credit for only one of EX PR 400, 401 and 402.

STUDENT TEACHINGS

Student teachers are placed with teachers holding a Saskatchewan Teaching Certificate in a school using the provincial curriculum and organized under the Education Act.

**ST TC 103.0
Student Teaching Sequential
Program
Elementary/Middle/Secondary - Year 3**

Prerequisite(s): Admission to the Sequential Program.

Involves directed observation and participation in a school classroom under the guidance of a cooperating teacher. It takes place in the second term of the first year of the Sequential program. The course carries no credit, but is a program requirement.

**ST TC 130.0
Student Teaching
B.Ed./B.Mus.(Mus.Ed.)
Elementary/Middle Years - Year 1**

Prerequisite(s): Admission to the B.Ed./B.Mus.(Mus.Ed.) Program.

Involves one week of directed observation in a music classroom after the conclusion of final examinations. The course carries no credit but is a program requirement.

**ST TC 137.0
Student Teaching B.Ed./B.Mus.(Mus.Ed.)
Secondary - Year 1**

Prerequisite(s): Admission to the B.Ed./B.Mus.(Mus.Ed.) Program.

Involves one week of directed observation in a music classroom after the conclusion of final examinations. The course carries no credit but is a program requirement.

**ST TC 200.0
Student Teaching
Heritage Languages Certificate
Program**

Involves demonstrations of teaching competence in a second-language classroom setting. The course carries no credit but is a requirement for the Certificate in Methods of Teaching Heritage Languages program.

**ST TC 213.0
Student Teaching Concurrent Program
Elementary/Middle - Year 2;
Secondary - Year 2**

Prerequisite(s): Elementary/Middle Years - EDFDT 101; Secondary - Completion of Education courses in Years 1 & 2.

Involves directed observation and participation in a school classroom. For students in the Elementary/Middle Years options, it take place in second term and for students in the Secondary option, it consists of a two-week experience in rural Saskatchewan after the conclusion of final examinations. The course carries no credit but is a program requirement.

**ST TC 230.0
Student Teaching
B.Ed./B.Mus.(Mus.Ed.)
Elementary/Middle Years - Year 2**

Prerequisite(s): Completion of Years 1 & 2 Education courses and ST TC 130.

Involves three weeks of directed observation and participation in a music classroom after the conclusion of final

examinations. The course carries no credit but is a program requirement.

**ST TC 237.0
Student Teaching
B.Ed./B.Mus.(Mus.Ed.) Secondary -
Year 2**

Prerequisite(s): Completion of Years 1 & 2 Education courses and ST TC 137.

Involves three weeks of directed observation and participation in a music classroom after the conclusion of final examinations. The course carries no credit but is a program requirement.

**ST TC 303.0
Student Teaching Concurrent Program
Elementary/Middle Years - Year 3**

Prerequisite(s): Completion of Years 1, 2 & 3 Education courses and ST TC 213.

Involves directed observation and participation in a school classroom and consists of a two-week experience in rural Saskatchewan after the conclusion of final examinations. The course carries no credit but is a program requirement.

**ST TC 304.0
Student Teaching Concurrent Program
Secondary - Year 3**

Prerequisite(s): Completion of Years 1, 2 & 3 Education courses and ST TC 213.

Involves directed observation and participation in a school classroom and consists of a two-week experience in rural Saskatchewan after the conclusion of final examinations. The course carries no credit but is a program requirement.

**ST TC 330.0
Student Teaching
B.Ed./B.Mus.(Mus.Ed.)
Elementary/Middle Years - Year 3**

Prerequisite(s): Completion of Years 1, 2 & 3 Education courses and ST TC 230.

Involves three weeks of directed observation and participation in a music classroom after the conclusion of final examinations. The course carries no credit but is a program requirement.

**ST TC 331.0
Student Teaching Music Single-
degree (1996 or earlier)
Elementary/Middle Years/Secondary -
Year 3**

Prerequisite(s): ST TC 231.

Involves three weeks of directed observation and participation in a music classroom after the conclusion of final examinations. The course carries no credit but is a program requirement for the Music Single-degree (1996 or earlier).

**ST TC 337.0
Student Teaching
B.Ed./B.Mus.(Mus.Ed.) Secondary -
Year 3**

Prerequisite(s): Completion of Years 1, 2 & 3 Education courses and ST TC 237.

Involves three weeks of directed observation and participation in a music classroom after the conclusion of final examinations. The course carries no credit but is a program requirement.

**ST TC 380.0
Student Teaching, Music Single-
degree (1996 or earlier)
Elementary/Middle Years - Year 4**

Corequisite(s): ST TC 431.

Involves five weeks of teaching experience in a regular classroom in third term. The course carries no credit but is a program requirement for the Music Single-degree (1996 or earlier).

Note: Students must have earned a CWA of 60% in their External and Education courses. Students must have completed all program requirements.

**ST TC 420.0
Student Teaching
B.Ed./B.Mus.(Mus.Ed.)
Elementary/Middle Years - Year 4**

Prerequisite(s): Completion of Years 1, 2, 3, & 4 Education courses and ST TC 330.

Involves three weeks of directed observation and participation in a regular classroom after the conclusion of final examinations. The course carries no credit but is a program requirement.

**ST TC 427.0
Student Teaching
B.Ed./B.Mus.(Mus.Ed.) Secondary -
Year 4**

Prerequisite(s): Completion of Years 1, 2, 3, & 4 Education courses and ST TC 337.

Involves three weeks of directed observation and participation in a Teaching Area II after the conclusion of final examinations. The course carries no credit but is a program requirement.

**ST TC 431.0
Student Teaching Music Single-
degree (1996 or earlier)
Elementary/Middle Years/Secondary
- Year 4**

Prerequisite(s): ST TC 331.

Involves three weeks of directed observation and participation in a music classroom after the conclusion of final examinations. The course carries no credit but is a program requirement for the Music Single-degree (1996 or earlier).

**ST TC 480.0
Student Teaching Music Single-
degree (1996 or earlier) Secondary -
Year 4**

Corequisite(s): ST TC 431.

Involves five weeks of teaching experience in Teaching Area II in third term. The course carries no credit but is a program requirement for the Music Single-degree (1996 or earlier).

Note: Students must have earned a CWA of 60% in their External and Educational courses. Students must also have a minimum average of 60% in each of Teaching Areas I and II. Students must have completed all program requirements.

SEMITIC LANGUAGES

See Hebrew courses.

**SMALL ANIMAL CLINICAL
SCIENCES**

Department of Small Animal Clinical Sciences, College of Veterinary Medicine

These courses are restricted to students enrolled in the Doctor of Veterinary Medicine program, unless otherwise stated.

**SACS 350.2
Veterinary Anesthesiology/ Surgical Principles
Q3(2L-3P), Q4(3L-3P)**

An Introduction to the science and pathophysiology of veterinary anesthesiology and surgery. A multiple species approach is utilized to assist students in developing an understanding of the fundamental principles and technical skills associated with the treatment and management of surgical conditions and anesthetic principles and techniques in veterinary medicine.

**SACS 351.2
Radiology
Q3&4(2L)**

Teaches the fundamentals of x-ray and ultrasound diagnosis. Using contemporary case material from the Veterinary Teaching Hospital, the instructors endeavour to actualize the learning process, assisting the students in the transition to the clinical phase of their studies. The students, for their part, engage in regular-self assessments, lecture inquiries, and extensive classroom preparation.

**SACS 371.4
General Internal Veterinary Medicine
Q2(2L), Q3(4L), Q4(4L-3P)**

A series of lectures dealing with the general aspects of the etiology, pathophysiology, clinical and laboratory findings, diagnosis and principles of treatment of generic diseases of the body systems of domestic animals. The emphasis is on the principles of pathophysiology as they relate to the diagnosis and rational treatment of disease.

**SACS 400.2
Surgical Exercises
Q1&2(3P)**

Introduces the student to the practical aspects of anesthesiology and surgery prior to entering clinics. The student is expected to become familiar with the instrumentation used in surgery and anesthesia, to become proficient in manipulative skills and to know and to understand surgical and anesthetic techniques in both large and small animals.

**SACS 420.2
Veterinary Medical Exercises
Q1, 2, 3, 4(3P)**

A series of clinical laboratory exercises which allow the student to learn the common restraint and diagnostic techniques which are necessary to handle animals and to make a clinical diagnosis. Students are taught how to conduct a complete clinical examination of all domestic animals. Special diagnostic techniques for the examination of each body system are also demonstrated.

**SACS 453.2
Small Animal Surgery
Q1(2L), Q2, 3(1L), Q4(2L)**

A comprehensive course covering the signs, diagnosis, management and treatment of the major surgical conditions in small animals. This course covers the disciplines of neurosurgery, urogenital surgery, surgery of the respiratory cardiovascular system, reconstructive surgery of the skin, surgery of the ears and surgery of the gastrointestinal tract,

orthopedic surgery and oncology. A case-based method is sometimes used.

**SACS 473.3
Small Animal Internal Medicine
Q1(2L), Q2, 3(3L), Q4(2L)**

A series of lectures which deal with the specific diseases of small animals (dogs and cats). The emphasis is on the etiology, pathogenesis, clinical and laboratory findings, diagnosis and treatment of common diseases which occur in dogs and cats.

SOCIOLOGY

Department of Sociology, College of Arts & Science

ST. THOMAS MORE COLLEGE

Sections of some courses in this department are taught by faculty in the corresponding department of St. Thomas More College. These course sections are designated in the *Registration Guide* by section numbers prefixed with the letter "M."

**SOC 110.6
Introduction to Sociology
1&2(3L)**

An introduction to sociological analysis of social institutions, relations, and groups, with emphasis on Canadian society. Contemporary and classical perspectives are used to study social structures and processes such as class, gender, race, ethnicity, community, work, education, justice, conflict, cooperation, and change.

Note: SOC 110 is an alternative prerequisite for POLST 252.

SOC 110 is the prerequisite for all 200-level courses in sociology.

**SOC 201.3
Economy and Society
1/2(3L)**

Examination of relationships between economic and social structures in contemporary industrial and pre-capitalist societies. Mode of production and social exchange analysis in study of social reproduction and social crises.

**SOC 203.3
Race and Ethnic Relations in Canada
1/2(3L)**

An introduction to and general overview of the various theoretical perspectives on race and ethnic relations and ethnicity. Addresses such issues as assimilation, racism, ethnic persistence, multiculturalism, and domination.

**SOC 204.3
Rural Sociology
1/2(3L)**

Analysis of social change in rural areas with emphasis on links between the social organization of resource-based industries and the social characteristics of rural communities. Rural Canada is the primary focus but international rural development issues are considered.

**SOC 205.3
Comparative Race and Ethnic Relations
1/2(3L)**

A comparative sociological analysis of ethnic relations will include discussion of ethnic stratification, separatism, pluralism, and politicization of ethnic minorities in selected societies.

**SOC 206.3
The Community
1/2(3L)**

Communities as forms of social organization, and community as a particular kind of social relationship; power, politics, and resistance in contemporary communities; research problems and case studies.

**SOC 207.6
The Family
1&2(3L)**

Analysis of sex, marriage, family and kinship institutions in contemporary society.

**SOC 212.3
Sociology of Crime and Delinquency
1/2(3L)**

The epidemiology of crime in society; the etiology of criminal and delinquent careers; the psychogenic, sociogenic and "role-career" perspectives of crime; problems of criminal statistics; patterns of police organization; the problem of police deviance and brutality; the effect of poverty upon "equal" treatment in the legal process.

**SOC 213.3
Immigration and the Canadian Mosaic
1/2(3L)**

Prerequisite(s): SOC 203 recommended.

Explores the process of immigration and its impact on Canadian society. Topics include theories of immigration, public immigration policies, ideology and acculturation, pluralism and ethnic identity, race relations and immigrant communities.

**SOC 214.3
Social Deviance and Social Control
1/2(3L)**

The social structure of "unacceptable" behaviour and roles; problems associated with the labelling of deviant behaviour; the relativity of normality and deviance; selected types of contemporary deviant labels; homosexuality; mental illness; radical political movements; the physically stigmatized; suicide; the illness role; ethnic minorities; prostitution.

**SOC 215.3
Sociology of Work
1/2(3L)**

A study of work and workers in historical and cross-cultural context. The course examines the social dimensions of various orientations to and kinds of work.

**SOC 217.3
The Sociology of Contemporary Religious Movements
1/2(3L)**

A survey of contemporary religious movements with emphasis upon structural and functional similarities and differences.

**SOC 220.6
Sociology and Social Welfare Organization
1&2(3L)**

The development of organized social welfare as a component of an industrialized society; an investigation of the sociological forces that influenced each developmental stage, resulting in the present social welfare phenomena.

**SOC 222.3
Sociology of Education Institutions and Processes
1/2(3L)**

An introduction to the sociology of education through an examination of the major theoretical approaches; conflict theory, structural functionalism, and symbolic interactionism. Examines the school as a social institution and a complex organization, and the ethnography of classroom relations between students and teachers.

**SOC 224.3
Collective Behaviour
1/2(3L)**

The study of social movements, institutional formation, and other collective phenomena such as fads, crazes, manias, panics, rumours, riots and mob outbursts. Collective behaviour theory and related sociological approaches are surveyed and applied.

**SOC 226.3
Social Stratification
1/2(3L)**

The study of systematic rankings in society: caste, feudal and class systems of stratification; the consequences of differential distribution of power, prestige and status; the correlatives of position in systems of stratification.

**SOC 227.6
Critical Issues in Canadian Society
1&2(3L)**

Canadian social structure and social change will be examined. The topics discussed will include: social class and inequality; elites; poverty; regionalism and separatism; labour; ethnicity; and other relevant social issues.

**SOC 230.3
Comparative Urban Sociology
1/2(3L)**

Comparative analysis of the implications of urban growth and urbanization for urbanism and urban planning in selected countries.

**SOC 232.3
Methods of Social Research
1/2(3L)**

Introduces the language of social research; research design; techniques of data collection; methods of measurement, scaling and sampling, and the interpretation and presentation of research findings.

**SOC 233.3
Introduction to Sociological Theory
1/2(3L)**

An introduction to sociological theory through an examination of the relationship between theory and research, and consideration of some of the better known theoretical models of the "middle range"

(e.g., social structure and anomie, reference group theory, etc.).

SOC 235.3
The Sociology of Aging
1/2(3L)

Provides an introductory sociological analysis of aging and old age. Issues will include demographic changes; theoretical approaches to old age; changing family systems and old age; work, leisure and retirement; socio-economic aspects and selected social policy issues. Course content will emphasize the Canadian situation.

SOC 237.3
Comparative Social Demography
1/2(3L)

An introduction to social demography in comparative perspective. Causes and consequences of rapid population growth, and effectiveness of fertility control in selected countries. The interrelation between the principal demographic variables: fertility, mortality, and migration.

SOC 238.3
Sociology of Health, Illness and Health Care
1/2(3L)

Introduction to sociological perspectives on Canadian health care policy and practice, and an examination of various socio-structural determinants of health and illness.

SOC 240.3
Application of Statistical Techniques in Sociology
1/2(3L)

Prerequisite(s): STATS 244.

The application of statistical techniques to sociology, with an emphasis on the understanding of assumptions, uses, strengths and weaknesses of the various tests of significance and measures of association.

Note: Students who have taken other courses in statistics, either from Arts and Science or from another college, should consult "Regulations for Introductory Courses in Statistics" for information on statistics course equivalencies. See Statistics Courses in the Index section of the *Calendar*.

SOC 242.3
An Introduction to the Sociology of Women's Studies
1/2(3L)

An introduction to sociological analyses of gender, in traditional as well as feminist perspective. Emphasizes gender differentiation and stratification as social processes as well as critical assessment of the assumptions, evidence, and arguments within the various theoretical approaches.

Note: Students with credit for SOC 239 may not take this course for credit.

SOC 244.3
The Sociology of Mass Media in Canada
1/2(3L)

Introduction to the sociological study of mass media institutions in Canadian society. Primary focus on the theoretical and historical context of print, broadcast and film media. Issues of ownership, regulation and the socialization of media workers will also be discussed.

SOC 246.3
Ideology and Mass Communication: A Sociological Approach
1/2(3L)

Introduction to the study of ways in which doctrines, opinions or ways of thinking of certain individuals or groups come to dominate the content of our mass media. Primary focus on the "manufacture of consent" in our society through an analysis of media messages about work, consumption and leisure in Canadian society.

SOC 292.3
Biotechnology and Social Change
1/2(3L)

Prerequisite(s): 6 credit units in sociology or 30 credit units of university courses.

Examines the evolution and development of the biotechnology industry, considered as part of the Information Revolution, and its relationship to the processes of social and cultural change. Various issues associated with the development and application of biotechnology are examined along with proposals for their practical management.

SOC 302.3
Sociology of Agriculture
1/2(3L)

Prerequisite(s): 12 credit units in sociology including SOC 204, or 6 credit units of sociology and third-year standing in the College of Agriculture.

Contemporary sociological approaches to the social organization of farming and agribusiness, including property, gender, and work relations, structural and institutional change, and the social ecology of resource management. Emphasis is on North America, with comparison to other regions.

SOC 303.6
History of Sociological Theory
1&2(3L)

Prerequisite(s): 12 credit units in sociology, including SOC 233.

The development of sociological thought in Europe and America since the 18th century. Description and criticism of principal historical and contemporary contributions to sociological theory.

SOC 304.3
Contemporary Marxist Sociology
1/2(3L)

Prerequisite(s): 12 credit units in sociology including SOC 233.

An introduction to the study of contemporary Marxist social thought. Focuses specifically on the ontological, conceptual and methodological issues, problems and implications inherent in the divergent schools of Marxist sociology.

SOC 305.3
Ethnic Stratification
1/2(3L)

Prerequisite(s): 12 credit units in sociology.

The study of the ideology and practice of ethnic stratification from a comparative perspective, and a critical review of theories and research in the area, including analyses of social-psychological approach, colonial model, split labour market, reserve army of labour, slavery, and other models.

SOC 306.3
Contemporary Class Structure
1/2(3L)

Prerequisite(s): 12 credit units in sociology, preferably including SOC 233.

An examination of theoretical models and empirical studies of the structure of social class relations in advanced industrial society. The course will examine patterns of class relations in the Western industrialized nations, and will also study selected "formally" socialist countries.

SOC 308.3
Community Development in Canada
1/2(3L)

Prerequisite(s): 12 credit units in sociology.

A sociological examination of community development concepts, approaches, and policies, with emphasis on recent Canadian experience. Local and regional projects, programs, and movements provide case material. The overseas record of Canadian development organizations is also considered.

SOC 309.3
Theories of Social Change
1/2(3L)

Prerequisite(s): 12 credit units in sociology.

A study of classical and contemporary sociological approaches to social change. The consequences of rapid change in institutional structures.

SOC 312.3
Current Issues in Criminal Justice
1/2(3L)

Prerequisite(s): SOC 212, and SOC 329 or 330.

Analysis of current developments in theories and research on criminogenesis, and the administration of criminal justice. Topics include inequalities of involvement and treatment in the justice system based upon race, class and gender. Developing a general theoretical structure of justice system operation and reform is a key concern.

SOC 313.6
Practicum in Criminal Justice I
(P)

Prerequisite(s): SOC 110 and enrolment in the Aboriginal Justice and Criminology Program for Native Students.

An applied course that provides students with professional experience and the ability to critique criminal justice processing and services for aboriginal people. Students are placed in a 12-week work program after consultation with the program co-ordinator.

SOC 314.6
Practicum in Criminal Justice II
(P)

Prerequisite(s): SOC 313 and enrolment in the Aboriginal Justice and Criminology Program for Native Students.

An applied course that provides students with professional experience and the ability to critique criminal justice processing and services for aboriginal people. Students are placed in a 12-week work program after consultation with the program co-ordinator.

SOC 315.3
Cross Cultural Perspectives on Poverty
1/2(3L)

Prerequisite(s): 12 credit units in sociology. Discussion of the concept and definition of poverty. Structural conditions that produce poverty at national and international levels. Internal and external factors related to the gap between rich and poor nations.

SOC 316.3
Sociology of Work Organizations
1/2(3L)

Prerequisite(s): 12 credit units in sociology, including SOC 215.

An advanced course dealing with work in diverse settings in modern society. It examines the formal and informal structures and processes in work organizations.

SOC 319.3
Native People in Urban Areas
1/2(3L)

Prerequisite(s): 12 credit units in sociology.

Describes and analyzes the growth, distribution and integration of the native population in Canadian urban centres as well as the causes and consequences of the urbanization of Canadian Native Peoples. Issues covered will include: education, law, family life and native-white relations.

SOC 320.3
Social Welfare and the Native Peoples
1/2(3L)

Prerequisite(s): 12 credit units in sociology.

Examines the involvement of the Native Peoples with the structures and processes of the Canadian social welfare system. It will investigate the extent to which the program meets the needs of the Native Peoples, and assess the total impact of the welfare system on them and their response to it.

SOC 321.3
The Sociology of Religion
1/2(3L)

Prerequisite(s): 12 credit units in sociology.

An analysis of religion in terms of the processes (e.g., secularization and urbanization), which have affected the religious institutions of the West, and of the social and personality structures which, in interaction, shape religion and are shaped by it.

SOC 322.3
Sociology of Education and Labour Markets
1/2(3L)

Prerequisite(s): 12 credit units in sociology.

An analysis of the relationship between formal education systems and change in labour markets and work processes. Emphasis is given to theories and research concerning the role of state policy, the degree of "fit" between education and work, and structured inequalities in the transition from school to work.

SOC 323.3
The Public Sphere and Public Opinion
1/2(3L)

12 credit units in sociology or 60 credit units in university courses.

Public opinion is a potent political force that affects the nature and pace of social, cultural and technological change. This course explores the relationship between public opinion, the public sphere and

democratic will formation and policy-making in contemporary societies with particular reference to biotechnology.
Note: This course has been revised to include focus on Biotechnology Industry.

**SOC 329.3
Penology and Corrections
1/2(3L)**

Prerequisite(s): 12 credit units in sociology including SOC 110 and 212.

An overview of the correctional system; from police, through courts and sentencing, incarceration, release and post-release processes; a look at the key positions and principles involved in custody, punishment and rehabilitation, with an emphasis on the Canadian system, but in a comparative context.

**SOC 330.3
Sociology of Law
1/2(3L)**

Prerequisite(s): 12 credit units in sociology, including one of SOC 214 or 212, or second or third year standing in the College of Law. Analyzes law as a social institution. Topics include the history of law as social control, the structures and processes of legal agents and legal agencies, law as a profession, law in the international context, and law and social change.

**SOC 332.6
Principles of Research Design
1&2(3L)**

Prerequisite(s): SOC 232, 240, STATS 244.

Examination of a series of issues to be resolved in formulating a comprehensive research design. Topics include: formulating the problem; plan of data organization; defining and selecting cases; collection of data; organization, analysis and interpretation of data. Each student is expected to develop a number of research projects during the year.

**SOC 336.3
Sociology of Professions
1/2(3L)**

Prerequisite(s): 12 credit units in sociology including SOC 233.

Provides a sociological analysis of the role of professions in contemporary society; the nature and organization of their work; and their relationship to other occupations and to the state.

**SOC 338.3
Sociology of Psychiatry and Mental Health Care
1/2(3L)**

Prerequisite(s): 12 credit units in sociology, including SOC 238.

Examines the changing definition of, and institutional response to, mental health problems, focusing on Canadian policy and practice.

**SOC 340.3
Marriage, Family and Society
1/2(3L)**

Prerequisite(s): 12 credit units in sociology, including SOC 207.

Emphasis will be placed on the analysis of changing patterns of marriage and the family within the contemporary social structure and on consequences and resulting trends from such structural changes.

**SOC 341.3
Institutional Racism and Canadian Native People
1/2(3L)**

Prerequisite(s): 12 credit units in sociology.

A sociological analysis of various models of institutional racism will be examined, and their applications to native experiences will be evaluated. Topics include: colonial domination, native reserves, urban natives, resource development, and welfare services.

**SOC 342.3
Sociological Theories of Gender Relations
1/2(3L)**

Prerequisite(s): 12 credit units in sociology including SOC 242, or 6 credit units in sociology and WGST 110.

Provides an in-depth theoretical examination of gender stratification and differentiation. It explores issues such as gender and race, gender and justice, and the gendered body. Issues will be analyzed from feminist perspectives using the theories of Marxism, symbolic interactionism, and post structuralism.

**SOC 344.3
Sociology of Women and Development
1/2(3L)**

Prerequisite(s): 12 credit units in sociology plus one of SOC 242, POLST 246, POLST 260, WGST 202, WGST 203, ECON 221, or INTL 200.

Examines women's place internationally but focuses on women in developing countries and critiques existing development theories, policies and practices. Themes including gender politics, productive and reproductive labour, population policies, sexuality and reproductive rights, environment and sustainable development and health will be explored in view of globalization with an emphasis on the roles of international, transnational, and aid agencies.

**SOC 345.3
Evaluation and Applied Social Research
1/2(3L)**

Prerequisite(s): SOC 232 and 240.

Designed to introduce students to the logic, design, conduct and analyses of evaluative and applied social research. Selective case studies of evaluation research will be presented and discussed.

**SOC 385.3
Selected Topics in Central American Sociology
2(2.5L-1.5S)**

Prerequisite(s): 6 credit units in 100-level sociology.

Part of the La Antigua, Guatemala Study Term abroad. Examines selected themes in contemporary Central American Sociology. May feature guest lecturers and field trips in neighbouring countries of the region.

400-level courses are restricted to students in their third and fourth years who have completed at least 18 credit units in sociology with good standing. (Some courses have other specific prerequisites). All 400-level courses will be conducted as seminars and will emphasize theoretical considerations.

**SOC 402.3
Advanced Seminar in the Sociology of Agriculture
1/2(3S) or 1&2(1.5S)**

Prerequisite(s): 18 credit units in sociology including SOC 204 or 302.

Theoretical and research approaches to the political and social economy of agriculture. Emphasis is given to contemporary works on agro-industrial reorganization, agro-food technology, sustainability, state intervention, international trade, aid, and agrarian reform.

**SOC 405.3
Social Change
1/2(3S) or 1&2(1.5S)**

The use of various social models in the analysis of social change. Selected theories of and research on change and development.

**SOC 409.3
Sociology of Development
1/2(3S) or 1&2(1.5S)**

A review of present theories of development. The main emphasis will be on the search for missing variables in theories of development produced by western social scientists.

**SOC 411.3
The Family: Developments in Research and Theory
1/2(3S) or 1&2(1.5S)**

Prerequisite(s): SOC 207.

Selected topics concerning marriage and family behaviour: recent developments in research and theory.

**SOC 412.3
Advanced Seminar in Ethnic Relations
1/2(3S) or 1&2(1.5S)**

Theoretical aspects of inter-ethnic processes. Comparative analysis of empirical research on ethnic minorities within Canada and other selected societies.

**SOC 413.3
Seminar in Sociology of Religion
1/2(3S) or 1&2(1.5S)**

Prerequisite(s): SOC 217 or 321.

An advanced seminar in sociological theories of religious behaviour.

**SOC 415.3
Selected Problems in Social Control
1/2(3S) or 1&2(1.5S)**

Theoretical analysis of and empirical research on selected problems in social deviancy and social control.

**SOC 416.3
Industrialism and Social Welfare
1/2(3S) or 1&2(1.5S)**

Prerequisite(s): SOC 220 or 215 or 315 or

316.

An advanced course which investigates various theoretical perspectives on social welfare as a social institution in the context of industrialism. Selected issues particularly relevant to Canada, such as resource development and social policy will be included.

**SOC 418.3
Advanced Criminology
1/2(3S) or 1&2(1.5S)**

Prerequisite(s): SOC 212 and either SOC 329 or 330.

An analysis and critique of current developments in Canadian criminological discourse, with an emphasis on the specific research issues and their relation to theoretical and policy developments.

**SOC 420.3
Medical Sociology
1/2(3S) or 1&2(1.5S)**

Prerequisite(s): 18 credit units in sociology including SOC 238.

Comparative study of health-care systems; the structure and functions of medical institutions; and the relationship between the organization of health-care delivery systems and the medical profession, society and the state.

**SOC 422.3
Social Stratification and Social Mobility
1/2(3S) or 1&2(1.5S)**

Prerequisite(s): 18 credit units in sociology including SOC 226.

A review of classical and modern theories of stratification and introduction to methods of studying social mobility. Emphasis on recent developments in models of social stratification and social mobility.

**SOC 426.3
Advanced Seminar in Social Policy
1/2(3) or 1&2(1.5S)**

Prerequisite(s): 18 credit units in sociology; SOC 220 or 320 recommended.

Examines the formulation, development, management and impact of social policies. Includes analysis and evaluation of social policies in income security, social services, employment, housing and other areas.

**SOC 435.3
New Directions in the Sociology of Education
1/2(3S) or 1&2(1.5S)**

Prerequisite(s): SOC 222.

Critical review and analysis of significant recent developments in sociological theory and research on education.

**SOC 436.3
An Advanced Seminar in the Sociology of Women and Health
1/2(3S) or 1&2(1.5S)**

Prerequisite(s): 18 credit units in sociology including SOC 242, and one of SOC 335 or 342.

Examines the relationship between women and the institution of medicine as a social practice. Specifically, it will explore the basis for women's health issues as rooted in their social position.

SOC 442.3
An Advanced Seminar in Contemporary Developments in Women's Studies
1/2(3S) or 1&2(1.5S)

Prerequisite(s): SOC 242 and 342.

Theoretical debates regarding the roles and relations of women and men, gender stratification, and the oppression of women, including critiques of traditional sociological theory, discourses on feminist epistemology, and the relationship between research methodology and the development of theory.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

SOC 398.3 1/2(3S)
 SOC 399.6 1&2(3S)
 SOC 498.3 1/2(3S)
 SOC 499.6 1&2(3S)

GRADUATE COURSES

Department of Sociology, College of Graduate Studies & Research

SOC 802.3
Advanced Seminar in the Sociology of Agriculture
1/2(3S) & 1&2(1.5S)

Theoretical and research approaches to the political and social economy of agriculture. Emphasis is given to contemporary works on agro-industrial reorganization, agro-food technology, sustainability, state intervention, international trade, aid, and agrarian reform.

SOC 805.3
Social Change
1/2(3S) or 1&2(1.5S)

The application of various social models to the analysis of social change. Consideration of selected theory and research on change and development.

SOC 809.3
Sociology of Development
1/2(3S) or 1&2(1.5S)

Review of present theories of development. Emphasis will be on the search for missing variables in theories of development produced by western social scientists. Considers development as a function of mobilization of resources and commitment of local people to the process of social change.

SOC 811.3
The Family: Developments in Research and Theory
1/2(3S) or 1&2(1.5S)

Study and discussion of the recent developments in research and theory in selected aspects of the area of marriage and the family behaviour.

SOC 812.3
Advanced Seminar in Ethnic Relations
1/2(3S) or 1&2(1.5S)

Theoretical aspects of interethnic processes; comparative analysis of empirical research on ethnic minorities within Canada and selected other societies.

SOC 813.3
Seminar in Sociology of Religion
1/2(3S) or 1&2(1.5S)

Prerequisite(s): SOC 217 or 321; or written permission of the department.

Advanced Seminar in Sociological Theories of Religious Behaviour.

SOC 814.3
Social Conflict
1/2(3S) or 1&2(1.5S)

Current issues and special problems in the sociology of conflict.

SOC 815.3
Selected Problems in Social Control
1/2(3S) or 1&2(1.5S)

Theoretical analysis and empirical research on selected problem of deviance and control.

SOC 816.3
Industrialism and Social Welfare
1/2(3S) or 1&2(1.5S)

Prerequisite(s): SOC 220 or 215 or 315 or 316; or permission of the instructor.

An advanced course examining various theoretical perspectives on industrialization and the institution of social welfare in the context of industrialism. Selected issues particularly relevant to Canada, such as resource development, social policy and the Native People will be included.

SOC 817.3
Sociology of Industrial Relations
1/2(3S)

Prerequisite(s): SOC 215 or 316.

Examines the need for articulated systems of industrial relations in contemporary societies. Issues covered include: the relationships between labour processes and industrial relations; variations in industrial relations regimes; specific systems including Canada, Sweden, USA, UK, and Japan as well as their historical-sociological determinants.

SOC 818.3
Advanced Seminar in Criminology
1/2(3S) or 1&2(1.5S)

Prerequisite(s): SOC 418.

An in-depth examination of historical developments leading to contemporary criminological discourse in Western societies. An analysis and critique of theory and method which characterizes different schools of criminological inquiry and their relationship to research in an international context.

SOC 819.3
Advanced Seminar in Victimology
1/2(3S) or 1&2(1.5S)

Prerequisite(s): SOC 332 and 418.

A critical analysis of recent development in victimology including an in-depth study of the methodological considerations necessary for studying processes and patterns of victimization. Students will be expected to participate in field research.

SOC 820.3
Medical Sociology
1/2(3S) or 1&2(1.5S)

Prerequisite(s): Written permission of the instructor.

Comparative study of Health-Care Systems, Medical Institutions, and the relationships between Medical and Allied Health

Professions, Society, the State, and the delivery of health-care.

SOC 822.3
Social Stratification and Social Mobility
1/2(3S) or 1&2(1.5S)

Prerequisite(s): 18 credit units in sociology including SOC 226.

Review of classical and modern theories of stratification and introduction to methods of studying social mobility. Emphasis on recent developments in models of stratification.

SOC 825.3
Political Sociology
1/2(3S)

Examines recent developments in theories of the state and different contemporary schools of thought, including structuralism, instrumentalism, and post-structuralism. The adequacy of emergence of social policy and the ability of theoretical models to account for historical/empirical developments.

SOC 826.3
Advanced Seminar in Social Policy
1/2(3S)

The formulation, development, management and impact of social policies. Includes analysis and evaluation of social policies in income security, social services, employment, housing and other areas concerned.

SOC 828.3
Small Groups
1/2(3S) or 1&2(1.5S)

The analysis of the small group with special reference to the problems of leadership, communication networks, deviance, and division of labour for specified group types. Review of the literature of small group experiments.

SOC 835.3
New Directions in the Sociology of Education
1/2(3S) or 1&2(1.5S)

Prerequisite(s): SOC 222; or permission of the instructor.

Critical review and analysis of significant recent developments in sociological theory and research on education.

SOC 840.6
Advanced Theory
1&2(3S)

Recent developments, current trends, and future prospects in sociological theory. Also introduction to formalization of theory; survey of evaluative criteria in Theory Building and methodological problems involved in this process.

SOC 841.6
Advanced Methodology
1&2(3S)

An advanced review of the logic, concepts and components of scientific research designs and methods and to quantitative statistical methods for the analysis and interpretation of sociological data.

SOC 842.3
Women's Studies
1/2(3S)

Prerequisite(s): SOC 342.

A review of established theories of gender stratification with an emphasis upon current

problems in research and theory construction.

SOC 890.3
Critical Perspectives on Social Analysis
1/2(3S)

Prerequisite(s): Admission to the Ph.D. program in sociology or Ph.D. students in cognate departments with permission of the Sociology Department.

An advanced seminar on conventional and alternative approaches to social analysis. The course contrasts positivist, rationalist orientations to social analysis with emergent critical alternatives such as critical sociology, postmodernism, feminist epistemologies, and minority discourses such as indigenous ways of knowing. Students will integrate critical understanding of social analysis with an applied examination of social policy and substantive areas of social change.

SOC 891.3
Theory and Method of Social Analysis
1/2(3S)

Prerequisite(s): Admission to the Ph.D. program in sociology or Ph.D. students in cognate departments with permission of the Sociology Department.

An advanced seminar which integrates theory and method in social analysis. Various types of social analysis will be discussed, including theory driven research, policy research, action oriented research and evaluation research. The focus is to develop sound analytical frameworks in conducting social analysis and in assessing research results. Students will develop a theoretically-grounded research problem on the basis of an existing body of literature, design a method, and obtain and analyze data.

SOC 898.3
Special Topics
1/2(3S) or 1&2(1.5S)

Prerequisite(s): Permission required.

Concentrated reading in special areas of sociology culminating in a written report. Area of concentration must be different from regularly scheduled courses.

SOC 990
Seminar

Discussions on research projects and papers by graduate students and faculty. All graduate students are required to register in and attend the seminar for at least one academic year (preferably their first year) and to present at least one seminar during their M.A. program.

SOC 992.6
Project

Prerequisite(s): Restricted to students registered in the project option.

A research paper on a topic approved by the candidate's Advisory Committee is required. The paper should be concerned with discussing a meaningful sociological question and may be empirical in nature, a critical review of the literature or a critical analysis of a substantive problem. The paper will be supervised and evaluated by the Advisory Committee.

SOC 994 Research

Students writing a Master's thesis must register for this course.

SOC 996 Research

Students writing a Ph.D. thesis must register for this course.

SOIL SCIENCE

Department of Soil Science, College of Agriculture

DIPLOMA COURSES

SL SC 41.6 Fundamentals of Soil Science 1(3L-2P)

Prerequisite(s): Restricted to students enrolled in the Diploma in Agriculture program in the College of Agriculture.

This course introduces students to the fundamental principles of soil science. It examines basic physical and chemical properties of soil, soil genesis and classification, soil fertility, and problem soils. Emphasis will be placed on the impact of these characteristics on soil productivity.

SL SC 52.6 Soil Fertility and Fertilizers 2(3L-2P)

Prerequisite(s): SL SC 41.6 and enrolled in the Diploma in Agriculture program in the College of Agriculture.

Examines major soil fertility issues with emphasis on their application in western Canada. Fundamental issues of soil nutrient status, form and function will be addressed. Fertilizer forms, application methods and behaviour in soil are examined with a view to maximizing their benefits to crop production. Methods of assessing soil fertility and basic fertilizer manufacturing processes will also be investigated.

SL SC 73.6 Soil Management and Land Evaluation 1(3L-2P)

Prerequisite: SL SC 41.6 and enrolled in the Diploma in Agriculture program in the College of Agriculture.

This course will identify soil quality parameters and discuss land capability classification, mapping, and soil mapping for precision farming. Soil management practices will be discussed for problem soil conditions and also for general conservation and improvement of soil fertility. Soil management practices and their effect on the soil and its environment will be discussed.

SL SC 88.3 and 89.6 Special Topics

These courses are offered occasionally in special situations to students enrolled in the Diploma in Agriculture program in the College of Agriculture. Interested students should contact the Department of Soil Science for more information.

DEGREE COURSES

SL SC 220.3 Environmental Soil Science 1(3L-2P)

Prerequisites: AGRIC 111 or GEOG 111 and 112 or GEOL (6 credit units).

Focuses on soils as an integrator of a broad range of environmental processes and as a critical component in human-induced environmental change. Major topics include the influence of the environment on soil formation; local, regional and global scales of soil formation; and the physical, chemical, and microbial/biochemical soil processes of relevance to environmental science.

Note: Students with credit for SL SC 240 may not take this course for credit.

SL SC 240.3 Agricultural Soil Science 2(3L-2P)

Prerequisite(s): AGRIC 111 and 112.

Introduces the student to the major areas of soil science and develop an understanding of how soils influence crop production, with special emphasis on fertility management and cropping systems in Western Canada. Pertinent chemical, physical, and biological processes in soil will be discussed in relation to their role in crop production. The impact of agricultural activities on the soil resource will also be examined.

Note: Students with credit for SL SC 220 may not take this course for credit.

SL SC 312.3 Soil Fertility and Fertilizers 1(3L-2P)

Prerequisites: SL SC 220 or 240.

The forms, flows, and transformations of plant nutrients in soils are examined, with emphasis on Western Canadian agricultural systems. The fate of applied fertilizers is stressed, especially as to how agronomic practices affect the utilization of soil and fertilizer nutrients by plants. Techniques for soil fertility evaluation and the development of suitable fertilizer recommendations are covered, along with approaches to fertilizer application. Best management practices for fertilizer and manure nutrients are considered.

SL SC 313.3 Soil Chemistry and Mineralogy 1(3L)

Prerequisite(s): CHEM 111 and 251; SL SC 220 or 240.

The lectures and reading assignments cover the structural and chemical properties of major soil components and the principles of soil chemical equilibria and kinetics in soil solution and surface chemistry in relation to pedogenesis and physical, chemical and biological properties of soils and environmental protection.

SL SC 322.3 Applied Soil Physics 1(3L-3P)

Prerequisites: SL SC 220 or 240.

The course combines theoretical and experimental elements aimed at providing understanding of the fundamental soil physical properties and processes, as well as the ability to solve practical problems

related to agricultural and environmental problems. Topics include a discussion of the solid, liquid, and gaseous phases of the soil and the interactions between the phases, the movement of water, air, and heat in soils, and the effects of these on plant growth and the environment. The laboratory involves the measurement of selected properties and their interpretation.

SL SC 332.3 Soil Genesis and Classification 1(3L)

Prerequisite(s): SL SC 220 or 240.

Deals with soil systems and their environments from the perspective of soil development and soil classification. Attention is given to the biotic, geological and physical factors that influence soil formation, and the response of soils to altered environments. The primary emphasis is on Canadian soils and classification, with significant attention to global soils. A one-day field trip takes place early in the term.

SL SC 343.3 Soil Microbiology 2(3L-3P)

Prerequisite(s): AP MC 212 or MICRO 214.

Lectures and reading assignments stress microbial population dynamics and activity in soils. The role of soil microorganisms in nutrient cycling and their effects on plant growth are discussed. Introduction to contemporary research problems in soil microbiology. Lab work illustrates and complements the lectures.

SL SC 403.3 Environmental Soil Analysis 2(2L-3P)

Prerequisite(s): SL SC 313; or the instructor's permission.

Focuses on theoretical and practical aspects of soil analysis pertinent to current environmental issues. Principles of soil sampling in environmental analysis and principles of chemical analysis in soil and environmental science will be covered. The laboratory is designed for students to acquire practical skills in sampling and analysis of soils and in the interpretation of the data.

SL SC 412.3 Integration and Application of Soil Science 1(2L-3P)

Prerequisite(s): 12 credit units of 300-level soil science courses; or the instructor's permission.

Integrates soil science principles and applies these principles to agronomic and environmental problems. Focuses on the field techniques used in soil and land resource science. The specific techniques taught in the course will be applied to current agronomic and environmental issues.

SL SC 420.3 Environmental Fate and Transport of Toxic Substances 1/2(3L-3P)

Prerequisite(s): 60 credit units in a science-based program (e.g. B.Sc., BSA, BE) including MATH 110 and PHYS 111 or

AGRIC 210 or the instructor's permission.

Lectures will address the fate and transport of toxic substances in the atmosphere, the hydrosphere, and the geosphere. Emphasis will be on actual transport processes (e.g. convection, advection, diffusion), losses to the environment (e.g. sorption, dry deposition, rain-out) and degradation (e.g. photo-oxidation, radioactive decay, microbial transformation) over time. Modelling programs such as STELLA will be used to illustrate fundamentals of transport processes within and between ecosystems.

SL SC 460.3 Forest Soils 1(3L)

Prerequisite(s): SL SC 332; or the instructor's permission.

Forest soils and forestry practices are discussed, with emphasis on boreal soils. Attention will be given to forest soil development, forest land capability and the effects of management practices (harvesting, fertilization, and site preparation) on soil properties. Interrelationships among natural occurrences (fire), nutrient and carbon cycling and environmental concerns will be examined. A three-day field trip takes place early in the term.

SL SC 470.3 Evaluation of Land Resources 1(3L-2P)

Prerequisites: SL SC 332; or the instructor's permission.

Provides students with a broad background in the principles and practice of land evaluation. Special emphasis will be given throughout the class on the use of soil resource survey information in land management. Specific evaluation systems for forestry agriculture and climate change applications will be examined. Geographic Information Systems will be discussed and students will use GIS to complete a major assignment.

SPECIAL TOPICS

These courses are offered occasionally in special situations. Students interested in such opportunities should contact the department for information on offerings.

SL SC 498.3

GRADUATE COURSES

Department of Soil Science, College of Graduate Studies & Research

SL SC 802.3 Experimental Topics in Soil Science 1&2(2S-4P)

Allows tutorial, reading and research in a specific area of Soil Science other than the thesis project. The student working under faculty guidance will perform specific experiments and write their data in the format of published papers. Enrolment permitted with the approval of the Chair and the instructor concerned.

**SL SC 803.3
Instrumental Techniques in Soil
Research
1&2(2L-4P)**

The theory and application of instrumental techniques to the study of soil and its constituents. Techniques in the following areas will be offered in alternate years: X-ray diffraction and fluorescence, atomic absorption, isotopic measurements, chromatography, differential thermal analysis, micropedology, soil moisture measurements, computer handling of data, continuous flow analysis, miscible displacement techniques.

**SL SC 811.3
Physical Chemistry of Soil
2(3L)**

The principles of the solution and surface chemistry of soil and the significance of these principles to understanding the physicochemical properties of soil, the availability of essential plant nutrients and the dynamics and equilibria of transformations of environmental pollutants. Emphasis will be on discussions of exchange, adsorption, solution-precipitation, oxidation-reduction, and chelation.

**SL SC 812.3
Soil-Plant Interrelationships
1(3L)**

Principles of nutrient and water movement in soils and absorption by plant roots. Examines root sampling and measurement techniques, root distributions and spatial pattern effects on nutrient absorption as well as importance of rhizosphere processes on nutrient release and uptake. Considers ways of expressing soil and plant factors and mechanisms quantitatively, and identifies parameters needed to mathematically describe soil-plant relationships. Simulation models for nutrient uptake and root growth will also be utilized.

**SL SC 821.3
Soil Physics
2(3L)**

The physical principles involved in the retention and movement of water, gases, heat, and chemical compounds within the soil.

**SL SC 831.3
Soil Mineralogy
2(3L)**

The structure, properties and origin of clay minerals occurring in soils and their relationship to other silicate minerals. Weathering and weathering sequences of importance to soil formation. The application of mineralogical and micromorphological techniques to the evaluation of pedogenic transformations.

**SL SC 832.3
Soil Landscape Analysis
1(2L-3P)**

Provides both practical training in the principles and techniques used to research soil landscapes and an examination of the theoretical basis for soil landscape analysis. A two to four-day field exercise is held early in the term, during which students become familiar with describing landscapes and appropriate sampling methods.

**SL SC 841.3
Biochemistry of the Soil
1(3L)**

A discussion of the organic fraction of the soil with emphasis on the carbon nitrogen, phosphorus and sulphur components and the behaviour of pesticides in soil.

**SL SC 842.3
Soil Microbiology
2(3L)**

Lectures and reading on recent advances in soil microbiology. Discussions of transformations of plant nutrients and soil humic compounds by microorganisms in soil, microbial growth, and plant-microbe interactions.

**SL SC 898.3
Special Topics
1&2(3S)**

Provides for a program of reading and discussion under faculty guidance. Students will prepare a series of essays in an area of concentration different from that of their thesis. Enrolment permitted with the approval of the Chairman of the department and the instructor concerned.

**SL SC 990
Seminar**

Soil Science graduate students must register and attend annually for the duration of their program. Students are required to present one seminar a year to a maximum of two for a Master's student and three for a Ph.D. student. The student's final seminar should be on their thesis topic but seminars presented early in their program may be on any topic of general interest to the Soil Science community.

**SL SC 992.6
Project**

Students undertaking the project Master's degree (M.Agr.) must complete this course as part of the requirements for the degree.

**SL SC 994
Research**

Students writing a Master's thesis must register for this course.

**SL SC 996
Research**

Students writing a Ph.D. thesis must register for this course.

SPANISH

Department of Languages and Linguistics,
College of Arts & Science

Students registered in any of the language courses (114.3, 117.3, 202.3, 204.3, 214.3, 217.3, 314.3, 317.3) should plan to attend weekly oral tutorials as scheduled in the *Registration Guide*. A multi-media laboratory is also available on a library basis.

Students with a background in Spanish (including those who speak the language at home) will not be allowed to take Spanish language courses for credit until they have contacted the department to arrange for an interview/ placement test prior to registering.

**SPAN 114.3 (Formerly 115)
Elementary Spanish I
1/2(4L-1T)**

Introduction to the study of the Spanish language, both oral and written, vocabulary building, essential structures, and basic grammar. The course also provides insight into Hispanic culture through a variety of activities such as readings, music, and videos.

Note: Students who have completed Spanish 30 in the past five years may not take this course for credit. Students who have taken high school Spanish courses, or any other Spanish courses, must present themselves to the Department to write a placement test. Native speakers of Spanish are not allowed to register in this course. Students with credit for SPAN 115 may not take this course for credit.

**SPAN 117.3 (Formerly 115)
Elementary Spanish II
1/2(4L-1T)**

Prerequisite(s): SPAN 114 or permission of the department.

A Spanish language course that builds on skills acquired in SPAN 114, completing the study of basic Spanish grammar, with emphasis on oral and written communication. The course aims to develop an appreciation of Hispanic culture.

Note: Students who have completed Spanish 30 in the past five years may not take this course for credit. Students who have taken high school Spanish courses, or any other Spanish courses, must present themselves to the Department to write a placement test. Native speakers of Spanish are not allowed to register in this course. Students with credit for SPAN 115 may not take this course for credit.

**SPAN 202.3 (Formerly 200)
Intermediate Spanish I: Oral Skills
and Cultural Understanding
1/2(4L-1T)**

Prerequisite(s): SPAN 114 and 117 or permission of the department.

Examines readings about Spanish and Latin American cultures, stressing oral composition. Students will have opportunities to develop their oral skills as well as to improve their knowledge of the language through a communicative approach. Regular attendance is required. *Note:* Native speakers of Spanish are not allowed to register in this course. Students with credit for SPAN 200 may not take this course for credit.

**SPAN 204.3 (Formerly 200)
Intermediate Spanish II: Oral Skills
and Cultural Understanding
1/2(4L-1T)**

Prerequisite(s): SPAN 202.

A Spanish language course that builds on skills acquired in SPAN 202 or equivalent. Students will continue to strengthen their language proficiency through a communicative approach by reading cultural texts, participating in dialogues, and making oral presentations. Regular attendance is required.

Note: Native speakers of Spanish are not allowed to register in this course. Students with credit for SPAN 200 may not take this course for credit.

**SPAN 205.3
Special Topics in the Latin American
Novel in English Translation
1/2(3L)**

Prerequisite(s): A course in English or Literature or another language.

Topics will change from year to year. These may include novels from a particular country or a theme within the Latin American novel.

Note: This course cannot be credited toward a major in Spanish or used to fulfill the language requirement. It may be used to fulfill the humanities requirements or as an elective under Requirement 7.

**SPAN 214.3 (Formerly 215)
Intermediate Spanish I: Grammar,
Writing, Literary Readings
1/2(3L-1T)**

Prerequisite(s): SPAN 114 and 117 or permission of the department.

An intensive study of Spanish grammar, with emphasis on writing skills. Short reading passages will be used to allow students to expand vocabulary and develop oral proficiency.

Note: Students with credit for SPAN 215 may not take this course for credit.

**SPAN 217.3 (Formerly 215)
Intermediate Spanish II: Grammar,
Writing, Literary Skills
1/2(3L-1T)**

Prerequisite(s): SPAN 214.

A Spanish language course that builds on skills acquired in SPAN 214. This course continues with the study of intermediate-advanced Spanish grammar, with a focus on written composition and the study of short literary passages. This course will continue giving the opportunity for oral practice.

Note: Students with credit for SPAN 215 may not take this course for credit.

**SPAN 261.0
Revolution and Dissidence: Studies
in Protest Literature
1/2(1T)**

Prerequisite(s): SPAN 214, 217 (may be taken concurrently).

A tutorial accompanying LIT 261.3.

**SPAN 262.0
Exiles and Emigrés: Studies in
Expatriation
1/2(1T)**

Prerequisite(s): SPAN 214, 217 (may be taken concurrently).

A tutorial accompanying LIT 262.3.

**SPAN 263.0
Heroines, Anti-Heroines and Gender
Definition in Literature
1/2(1T)**

Prerequisite(s): SPAN 214, 217 (may be taken concurrently).

A tutorial accompanying LIT 263.3.

**SPAN 264.0
Mephisto and Faust: Knowledge,
Power, Damnation and Redemption
1/2(1T)**

Prerequisite(s): SPAN 214, 217 (may be taken concurrently).

A tutorial accompanying LIT 264.3.

COURSES • Spanish

SPAN 305.3 Representative Works in Spanish Peninsular Literature 1(3L)

Prerequisite(s): SPAN 202, 204, 214, 217.
An introduction to the literary masterpieces of Spain, through the reading and study of Spanish texts from the medieval period to modern times.

SPAN 306.3 Introduction to Spanish American Literature 2(3L)

Prerequisite(s): SPAN 202, 204, 214, 217.
Examines the work of twelve writers of Latin America from the 19th century to the present whose works are representative of literary currents in Latin America.

SPAN 307.3 The Latin American Short Story/El cuento latinoamericano 3L

Prerequisite: SPAN 204 and 217; or equivalent.

El cuento latinoamericano will introduce students to an exemplary genre of Latin American literature – the short story. The course will include a brief history of the development of the short story genre in Latin America and then will entail in-depth textual analysis of masterpieces of the short story from all parts of Spanish speaking Latin America: the Caribbean, Central America, Mexico, Chile, Argentina, Uruguay, Peru, Colombia, etc. All class lectures and readings are in Spanish. Selections will include works of internationally renowned authors such as Gabriel Garcia Marquez (Colombia), Carlos Fuentes (Mexico), Mario Benedetti (Uruguay), Jorge Luis Borges (Argentina), Alejo Carpentier (Cuba), Julio Cortazar (Argentina); as well as ten other authors chosen at the discretion of the individual instructor.

SPAN 308.3 The Peninsular Spanish Novel: From the Generation of 1898 to 2000 3L

Prerequisite: SPAN 204 and 217; or equivalent.

The Peninsular Novel introduces students to masterpieces of the novelistic genre from twentieth century Spain. The course will include a brief history of the development of the novel in Spain. All class lectures and readings are in Spanish. Selections may include works of internationally renowned authors such as Miguel de Unamuno, Camilo Jose Cela, Ana Maria Matute, Miguel Delibes, Luis Martin Santos, Juan Goytisolo, Ramon Sender, as well as other authors chosen at the discretion of the individual instructor.

SPAN 314.3 (Formerly 315) Advanced Spanish I 1/2(3L-1T)

Prerequisite(s): SPAN 202, 204, 214, 217, or permission of the department.

Advanced grammar and vocabulary expansion with emphasis on idiomatic speech taken from real situations in everyday life in Spain and Latin America. The course focuses on written exercises, such as compositions and translations, as well as on the formal

aspect of academic writing. A good portion of class time will be spent discussing literary passages.

Note: Students with credit for SPAN 315 may not take this course for credit.

SPAN 317.3 (Formerly 315) Advanced Spanish II 1/2(3L-1T)

Prerequisite(s): SPAN 314.

A Spanish language course that builds on skills acquired in SPAN 314, completing the study of advanced Spanish grammar and continuing with written and oral exercises, literary readings and formal writings.

Note: Students with credit for SPAN 315 may not take this course for credit.

SPAN 403.3 Introduction to Spanish Poetry 1/2(3L)

Prerequisite(s): SPAN 305.

Surveys poetry in Spain from the early Renaissance to the present time.

SPAN 405.3 The Spanish Novel in the Golden Age 1/2(3L)

Prerequisite(s): SPAN 305.

Includes selections of readings from Spanish novelists of the Golden Age in Spain.

SPAN 406.3 20th-Century Latin American Poetry 1/2(3L)

Prerequisite(s): SPAN 306.

A study of the style and thematic content of major Modernist and Post Modernist poets.

SPAN 408.3 The Modern Latin American Novel 1/2(3L)

Prerequisite(s): SPAN 306.

A study of the modern novel in Latin America through discussion and close reading of five novels, assigned readings and lectures.

SPAN 420.3 Contemporary Central American Novel 3L

Prerequisites: SPAN 317 and one of SPAN 306 or 307.

This course will explore contemporary Central American narrative, taking testimonial writing as a starting point. The course addresses issues regarding testimonial writing such as the role of literature in Central American politics, the relationship between power and literature, the role of women in the conflict during the war years, the indigenous peoples' situation and their struggle for survival.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

SPAN 298.3 1/2(3S)
SPAN 299.6 1&2(3S)
SPAN 398.3 1/2(3S)
SPAN 399.6 1&2(3S)
SPAN 498.3 1/2(3S)
SPAN 499.6 1&2(3S)

SPECIAL STUDIES

College of Arts & Science

**SP ST 298.3, 398.3, 498.3
Special Studies
SP ST 299.6, 399.6, 499.6
Special Studies**

SPECIAL TOPICS COURSES

College of Arts & Science

These are courses numbered 298.3, 299.6, 398.3, 399.6, 498.3 and 499.6 taught occasionally by faculty and visiting scholars in departments. They are listed in each department program. Students may receive credit for more than one Special Topics course in a department.

STATISTICS

Department of Mathematics and Statistics,
College of Arts & Science

STATS 103, 241 and 341 are courses in probability. All other courses carrying the STATS abbreviation are courses in statistics.

Restrictions on Credit for introductory Statistics Courses

Students with credit for STATS 103 are eligible to subsequently take STATS 241, 244, 245 or 246 for credit. Students may NOT take STATS 103 for credit either concurrently or following STATS 241, 245, 246 or ECON 204. Students may take both STATS 103 and STATS 244 regardless of order completed. Students are not permitted to take more than one of STATS 242, 244, 245 or 246 for credit. Students may take STATS 241 for credit before, concurrently, or after any one of STATS 244, 245 or 246.

Students with credit for an introductory statistics course offered by another department or college should consult "Regulations on Introductory Courses in Statistics" and check with that academic unit for any other restrictions.

STATS 103.3 Elementary Probability 1/2(3L)

Prerequisite(s): Mathematics B30 (or Algebra 30).

An elementary introduction to the concepts of probability, including: sets, Venn diagrams, definition of probability, algebra of probabilities, counting principles, some discrete random variables and their distributions, graphical displays, expected values, the normal distribution, the Central Limit Theorem, applications, some statistical concepts.

Note: This is a course in probability, not an introduction to statistics. Students wishing an introduction to statistics should take STATS 244, 245 or 246. This course may not be taken for credit towards a major in mathematics or statistics. Students with credit for MATH 102.6 may not take this course for credit. Students may receive credit for both STATS 103 and 241, 245 or 246, provided STATS 103 is taken and

successfully completed first. Students may not receive credit for STATS 103 if ECON 204 has already been completed. Students taking ECON 204 subsequent to STATS 103 may only receive 3 credits for the ECON course. This course may not be used in Requirement 1 for Program Type C.

STATS 241.3 Probability Theory 1/2(3L-1P)

Prerequisite(s): MATH 110 and 116.

Laws of probability, discrete and continuous random variables and their distributions, moments, functions of random variables and their distributions, Central Limit Theorem.

STATS 242.3 Statistical Theory and Methodology 2(3L-1P)

Prerequisite(s): MATH 110 and 116, and STATS 241.

Sampling theory, estimation, testing hypotheses, confidence intervals, goodness of fit, analysis of variance, regression and correlation.

Note: Students are not permitted to take more than one of STATS 242, 244, 245, 246 or other introductory statistics courses for credit. For further details on courses in statistics refer to the Index section of the *Calendar* under Statistics Courses.

STATS 244.3 Elementary Statistical Concepts 1/2(3L-1P)

Prerequisite(s): A course in a social science (or Mathematics A30).

Statistical concepts and techniques including graphing of distributions, measures of location and variability, measures of association, regression, probability, hypothesis testing. Students should consult with their department before enrolling in this course to determine the status of the course in their program.

Note: For students in one of the Social Sciences, Education or Nursing. This course may not be included in the courses making up a major in mathematics or statistics.

Note: Students are not permitted to take more than one of STATS 242, 244, 245, 246 or other introductory statistics courses for credit. For further details on courses in statistics refer to the index section of the *Calendar* under Statistics.

STATS 245.3 Introduction to Statistical Methods 1/2(3L-1P)

Prerequisite(s): MATH 100, 101, 102, 110 or STATS 103.

An introduction to basic statistical methods including frequency distributions, elementary probability, confidence intervals and tests of significance, analysis of variance, regression and correlation, contingency tables, goodness of fit.

Note: May not be included in the courses making up a major in mathematics or statistics. Students are not permitted to take more than one of STATS 242, 244, 245, 246 or other introductory statistics courses for credit. For further details on courses in statistics refer to the index section of the *Calendar* under Statistics.

**STATS 246.3
Introduction to Biostatistics
1/2(3L-2P)**

Prerequisite(s): MATH B30 and BIOL 110.6 or permission of the Department. One of MATH 101.3, 110.3 or STATS 103.3 recommended but not essential.

An introduction to statistical techniques, with emphasis on methods particularly applicable to biological, and health sciences, including descriptive statistics, estimation and testing, linear and logistic regression, contingency tables, life tables, and experimental design. Computerized data analysis will be an essential component of the labs.

Note: This course may not be included in the courses making up a major in mathematics or statistics. Students are not permitted to take more than one of STATS 242, 244, 245, 246 or other introductory statistics courses for credit. For further details on courses in statistics refer to the index section of the *Calendar* under Statistics.

**STATS 341.3
Probability and Stochastic Processes
1/2(3L-1P)**

Prerequisite(s): STATS 241.

Random variables and their distributions; Independence; Moments and moment generating functions; Conditional probability; Markov chains; Stationary time-series.

**STATS 342.3
Mathematical Statistics
1(3L-1P)**

Prerequisite(s): MATH 225 or 276; STATS 241 and 242.

Probability spaces; conditional probability and independence; discrete and continuous random variables; standard probability models; expectations; moment generating functions; Sums and functions of random variables; Sampling distributions; Asymptotic Distributions. Deals with basic probability concepts at a moderately rigorous level.

Note: Students with credit for STATS 340 may not take this course for credit.

**STATS 344.3
Applied Regression Analysis
1/2(3L-1P)**

Prerequisite(s): STATS 242 or 245 or 246 or a comparable course in statistics.

Applied regression analysis involving the extensive use of computer software. Includes: linear regression; multiple regression; stepwise methods; residual analysis; robustness considerations; multicollinearity; biased procedures; non-linear regression.

Note: Students with credit for ECON 404 may not take this course for credit. Students with credit for STATS 344 will receive only half credit for ECON 404.

**STATS 345.3
Design and Analysis of Experiments
1/2(3L-1P)**

Prerequisite(s): STATS 242 or 245 or 246 or a comparable course in statistics.

An introduction to the principles of experimental design and analysis of variance. Topics will include randomization, blocking, factorial experiments,

confounding, random effects, analysis of covariance. Emphasis will be on fundamental principles and data analysis techniques rather than on mathematical theory.

**STATS 346.3
Multivariate Analysis
1/2(3L-1P)**

Prerequisite(s): MATH 266, STATS 241 and 344 or 345.

The multivariate normal distribution, multivariate analysis of variance, discriminant analysis, classification procedures, multiple covariance analysis, factor analysis, computer applications.

**STATS 347.3
Non-Parametric Methods
1/2(3L-1P)**

Prerequisite(s): STATS 242 or 245 or 246 or a comparable course in statistics.

An introduction to the ideas and techniques of non-parametric analysis. Included are studies of the one, two and K samples problems, goodness of fit tests, randomness tests, and correlation and regression.

**STATS 348.3
Sampling Techniques
1/2(3L-1P)**

Prerequisite(s): STATS 242 or 245 or 246 or a comparable course in statistics.

Theory and applications of sampling from finite populations. Topics discussed include simple random sampling, stratified random sampling, cluster sampling, systematic sampling, probability proportionate to size sampling, and the difference, ratio and regression methods of estimation.

**STATS 349.3
Time Series Analysis
1/2(3L-1P)**

Prerequisite(s): STATS 241, and 344 or 345.

An introduction to statistical time series analysis. Topics include trend analysis, seasonal variation, stationary and non-stationary time series models, serial correlation, forecasting and regression analysis of time series data.

**STATS 442.3
Statistical Inference
2(3L-1P)**

Prerequisite(s): STATS 342.

Parametric estimation, maximum likelihood estimators, unbiased estimators, UMVUE, confidence intervals and regions, tests of hypotheses, Neyman Pearson Lemma, generalized likelihood ratio tests, chi-square tests, Bayes estimators.

**STATS 443.3
Linear Statistical Models
2(3L-1P)**

Prerequisite(s): MATH 266, STATS 342, and 344 or 345.

A rigorous examination of the general linear model using vector space theory. Includes: generalized inverses; orthogonal projections; quadratic forms; Gauss-Markov theorem and its generalizations; BLUE estimators; Non-full rank models; estimability considerations.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

STATS 398.3 1/2(3S)
STATS 399.6 1&2(3S)
STATS 498.3 1/2(3S)
STATS 499.6 1&2(3S)

GRADUATE COURSES

Department of Mathematics and Statistics,
College of Graduate Studies & Research

**STATS 841.3
Probability Theory
1/2(3L)**

Prerequisite(s): STATS 241 and MATH 371; or permission of the department.

Probability spaces and random variables. Distribution functions. Convergence of random variables. Characteristic functions. Fundamental limit theorems. Conditional expectation.

**STATS 842.3
Stochastic Processes
1/2(3L)**

Prerequisite(s): STATS 841.

Stochastic processes and random functions. Random walks, Markov property, and Martingales. Stationary processes and ergodic theorems. Invariance principles and strong approximation.

**STATS 843.6
Experimental Design and Analysis
1&2(3L)**

Statistical analysis of the following experimental designs: completely randomized, randomized complete block, factorial, Latin square, incomplete block, fractional replications, confounded, lattice, split plot and nested designs. Development of the concepts of fixed, mixed and random experimental models, regression analysis, and optimality of designs.

**STATS 844.6
Statistical Inference
1&2(3L)**

Estimation: Problem of point estimation, unbiased estimation, lower bounds for the variance, complete and sufficient statistics, minimax estimation, admissibility, invariance, estimation by confidence sets. Testing Hypotheses: Neyman-Pearson fundamental lemma and uniformly most powerful tests, unbiased invariance, linear hypotheses, minimax principle.

**STATS 845.3
Statistical Methods for Research
1/2(3L)**

Prerequisite(s): STATS 242 or 245; or permission of the department.

Statistical methods as they apply to scientific research, including: Experimental design, blocking and confounding, analysis of multifactor experiments, multiple regression and model building.

**STATS 846.3/847.6
Special Topics in Probability and Statistics
1/2(3L), 1&2(3L)**

Topics will be related to recent developments in statistics and probability (multivariate statistics, time series, experimental design,

non-parametric statistics, etc.) of interest to the instructor and students.

**STATS 848.3
Multivariate Data Analysis
1/2(3L)**

Prerequisite(s): COMM 395 and STATS 345 or 845; or permission of the department.

A survey of methods for analyzing discrete and continuous multivariate data. Includes: Log-linear models, logistic regression, canonical correlation, discriminant analysis, cluster analysis, MANOVA, factor analysis.

**STATS 849.3
Spectral Analysis of Time Series
1/2(3L)**

Introduction to spectral analysis for graduate students with reasonable competence in Mathematics at the third year level and some exposure to probability and statistics. Topics include a description of Wiener and stochastic approaches to Spectral Analysis, spectral representation of univariate and multivariate time series, linear filters, spectral estimation, sampling theory for spectral estimators

SURGERY

Department of Surgery, College of Medicine

These courses are restricted to students enrolled in the College of Medicine.

**SURG 501.8
Surgery
PD (8 weeks)**

An eight-week senior clerkship on the surgical wards. Experience will be gained in the clinical management of General Surgery patients. Students may spend four of their eight weeks working on other than General Surgery wards selective. Opportunities available are in Cardiovascular-Thoracic Surgery, Intensive Care, Neurosurgery, Orthopedics, Otolaryngology, Pediatric Surgery, Plastic Surgery and Urology. During the clerkship students undertake a responsible role in the care of patients, they gain operating room experience and participate in teaching rounds, seminars, lectures and out patient clinics.

GRADUATE COURSES

Department of Surgery, College of Graduate Studies & Research

**SURG 801.6
Surgery
1&2(4S)**

Seminars deal with general and orthopaedic surgery, and Surgical Grand Rounds from September 1 to June 30 in order to provide a clinical orientation to the student's experimental work and study of the basic sciences. Written and oral examinations are held at the end of the course.

**SURG 802.3
Surgery
1/2(2L-1S)**

Each student is required to prepare work for this. A study of both basic science as applied to general surgery and the fundamentals of surgical disease processes is made.

COURSES • Surgery

SURG 803.6

Surgery 1&2(3S)

Prerequisite(s): Permission of the Division of Orthopaedic Surgery.

Seminars dealing with Orthopaedic Surgery. A study is made of basic sciences, including Anatomy, Physiology, and Biochemistry as applied to Orthopaedic Surgery. A study of both basic science and clinical aspects of musculoskeletal disease. A presentation of orthopaedic clinical material with discussion of the fundamental principles involved. Each student assists in the preparation of material for presentation.

SURG 804.3

Surgery 1/2(3C)

Designed to provide complete coverage of the field of plastic surgery.

SURG 994

Research

Students writing a Master's thesis must register for this course.

TECHNICAL

Department of Curriculum Studies, College of Education

TECH 183 and TECH 187 and all other TECH courses are provided through the College of Education.

For further information about other Industrial Arts content courses, contact the Undergraduate Programs Office, College of Education.

TECH 183.3

Drafting 1(6P)

Prerequisite(s): Restricted to students in the Industrial Arts and Vocational Education programs.

Graphics is presented as an essential communication skill in technical fields. The fundamental theory and skills of engineering drawing will involve the students in the proper use of instruments, the principles of applied geometry and the theory of orthographic projection so that they will be able to draw and read working drawings quickly and accurately.

TECH 187.3

Wood Fabrication 1/2(1L-3P)

Prerequisite(s): Restricted to students in the Industrial Arts and Vocational Education programs.

Provides essential background for Industrial Arts teachers to enable them to demonstrate and have students perform common hand- and machine-tool operations correctly and safely. Essential information about materials, layout, assembly and finishing is included.

TOXICOLOGY

Department of Veterinary Biomedical Sciences, College of Graduate Studies & Research

TOX 810.3

Radiation and Radionuclide Toxicology 1/2(3L)

Prerequisite(s): Minimum of one university-level course in any four of physics, chemistry, microbiology, statistics, cell biology, or ecology.

Describes the basic properties of ionizing radiation, the interaction of radiation with matter, radiation detection, units and dosimetry. Discusses the natural radiation environment, radioactivity and its distribution and accumulation by chemical and biological processes. Presents the biological effects of radiation, particularly carcinogenesis, both at the epidemiological and molecular level.

TOX 860.3

Applied Toxicology 1&2(1L-S/T)

Prerequisite(s): VT P 836, 837, and/or permission of the instructor. Other courses in Toxicology are highly desirable.

Provides students an opportunity to evaluate practical problems associated with various aspects of toxicology. Students will be presented with specific toxicological questions or concerns which will be examined using research information and library facilities.

TOX 898.3/899.6

Special Topics

TOX 990

Seminar

Reviews of literature and recent investigations. Graduate students are required to attend and to present seminars.

TOX 994

Research

Students writing a Master's thesis must register for this course.

TOX 996

Research

Students writing a Ph.D. thesis must register for this course.

UKRAINIAN

Department of Languages and Linguistics, College of Arts & Science

Students registered in any of the language courses (114.3, 117.3, 214.3, 217.3, 314.3, 317.3) should plan to attend weekly oral tutorials as scheduled in the *Registration Guide*. A multi-media laboratory is also available on a library basis.

Students with a background in Ukrainian (including those who speak the language at home) will not be allowed to take Ukrainian language courses for credit until they have contacted the department to arrange for an interview/ placement test prior to registering.

UKR 114.3 (Formerly 115)

Elementary Ukrainian I 1/2(4L-1T)

This course develops elementary proficiency in speaking, reading, understanding, and writing Ukrainian. Basic

grammatical structures, sound patterns, spelling and vocabulary will be studied. Students will be introduced to Ukrainian life and culture, politics, geography and society.

Note: Students who have completed Ukrainian 30 in the past five years may not take this course for credit. Students who have a background in Ukrainian or have taken any other Ukrainian courses, must present themselves to the Department to write a placement test. Native speakers of Ukrainian are not allowed to register in this course. Students with credit for UKR 115 may not take this course for credit.

UKR 117.3 (Formerly 115)

Elementary Ukrainian II 1/2(4L-1T)

Prerequisite(s): UKR 114.

This course is a continuation of UKR 114. It develops elementary proficiency in speaking, reading, understanding, and writing Ukrainian. Basic grammatical structures, sound patterns, spelling and vocabulary will be studied. Students will be introduced to Ukrainian life and culture, politics, geography and society. Students will develop the ability to understand spoken Ukrainian and respond to it within certain everyday topics.

Note: Students who have completed Ukrainian 30 in the past five years may not take this course for credit. Students who have a background in Ukrainian or have taken any other Ukrainian courses, must present themselves to the Department to write a placement test. Native speakers of Ukrainian are not allowed to register in this course. Students with credit for UKR 115 may not take this course for credit.

UKR 205.3

A Survey of Ukrainian Literature in English Translation 1/2(3L)

Prerequisite(s): Completion of 30 credit units at the university.

Surveys the development of Ukrainian literature from its origins to the present. Students will read representative works in English translation of the more important genres in each period of Ukrainian literature.

Note: This course cannot be used to fulfill the language requirement. It may be used to fulfill the humanities requirements or as an elective under Requirement 7.

UKR 211.3

20th-Century Ukraine (in English) 1/2(3L)

Prerequisite(s): Completion of 30 credit units at the university.

An introduction to contemporary Ukraine, surveying the land, the people, the culture and the way of life in present-day Ukraine.

Note: This course cannot be used to fulfill the language requirement. It may be used to fulfill the humanities requirements or as an elective under Requirement 7.

UKR 212.3

Survey of Ukrainian Folklore (in English) 1/2(3L)

Prerequisite(s): Completion of 30 credit

units at the university.

Surveys the material folk culture, calendar traditions, rites, family customs and the oral literature of the Ukrainian people.

Note: This course cannot be used to fulfill the language requirement. It may be used to fulfill the humanities requirements or as an elective under Requirement 7.

UKR 214.3 (Formerly 215)

Intermediate Ukrainian I 1/2(3L-1T)

Prerequisite(s): UKR 114 and 117 or permission of the department.

This course will concentrate on improving speaking, reading, and writing skills by further expanding the basic syntactic, morphological, lexical, and phonetic structure of modern Ukrainian. Students will be introduced to contemporary life and culture of Ukraine.

Note: Native speakers of Ukrainian are not allowed to register in this course. Students with credit for UKR 215 may not take this course for credit.

UKR 216.3

Ukrainian Prose 1/2(3L)

Prerequisite(s): UKR 214, 217.

Surveys the development of Ukrainian prose from its beginnings to the present. Works of representative authors in each period are studied.

UKR 217.3 (Formerly 215)

Intermediate Ukrainian II 1/2(3L-1T)

Prerequisite(s): UKR 214.

This course builds on skills acquired in UKR 214. Emphasis is placed on improving oral and written skills through the extensive study of Ukrainian grammar. This course will continue providing students with a view of contemporary life and culture.

Note: Native speakers of Ukrainian are not allowed to register in this course. Students with credit for UKR 215 may not take this course for credit.

UKR 220.3

Ukrainian Culture in Canada (in English) 1/2(3L)

Prerequisite(s): Completion of 30 credit units at the university.

Surveys the development of Ukrainian culture in Canada. It provides an overview of the block settlement architecture, folkloric expression, religious and distinctive political organizations in the process of cultural retention in Canadian society.

Note: This course cannot be used to fulfill the language requirement. It may be used to fulfill the humanities requirements or as an elective under Requirement 7.

UKR 226.3

Ukrainian Poetry 1/2(3L)

Prerequisite(s): UKR 214, 217.

Surveys the development of Ukrainian poetry from its beginning to the present. Works of representative poets in each period are studied.

**UKR 230.3
Pre-Soviet Ukrainian Civilization
(Formerly 209)
1/2(3L)**

Prerequisite(s): UKR 214, 217 and completion of 30 credit units at the university.

A survey of the material, spiritual and intellectual culture in Ukraine from prehistory to the beginning of the 20th century.

**UKR 261.0
Revolution and Dissidence: Studies in Protest Literature
1/2(1T)**

Prerequisite(s): UKR 214, 217 (may be taken concurrently).

A tutorial accompanying LIT 261.3.

**UKR 262.0
Exiles and Emigrés: Studies in Expatiation
1/2(1T)**

Prerequisite(s): UKR 214, 217 (may be taken concurrently).

A tutorial accompanying LIT 262.3.

**UKR 263.0
Heroines, Anti-Heroines and Gender Definition in Literature
1/2(1T)**

Prerequisite(s): UKR 214, 217 (may be taken concurrently).

A tutorial accompanying LIT 263.3.

**UKR 264.0
Mephisto and Faust: Knowledge, Power, Damnation and Redemption
1/2(1T)**

Prerequisite(s): UKR 214, 217 (may be taken concurrently).

A tutorial accompanying LIT 264.3.

**UKR 300.3
Studies in Ukrainian Authors
1/2(3L)**

Prerequisite(s): UKR 214, 217.

One Ukrainian author, such as Shevchenko, Franko, or Ukrainka, will be studied.

**UKR 310.3
Topics in Ukrainian Literature in English Translation
1/2(3L)**

Prerequisite(s): 12 credit units in literature or UKR 205.

One author, genre or literacy period will be studied.

Note: This course cannot be used to fulfill the language requirement. It may be used to fulfill the humanities requirements or as an elective under Requirement 7.

**UKR 314.3 (Formerly 315)
Advanced Ukrainian I
1/2(3L-1T)**

Prerequisite(s): UKR 214, 217.

Selected readings, composition exercises and a grammar review focusing on phonetics and morphology are used to improve the student's command of oral and written Ukrainian. There is no translation and the course is conducted entirely in Ukrainian.

**UKR 317.3 (Formerly 316)
Advanced Ukrainian II
1/2(3L-1T)**

Prerequisite(s): UKR 214, 217.

Selected readings, composition exercises and a grammar review are used to improve the student's command of oral and written Ukrainian.

**UKR 350.3
Studies in Ukrainian Literary Periods
1/2(3L)**

Prerequisite(s): UKR 214, 217.

One period in Ukrainian literature, such as Romanticism, Realism, or Modernism, will be studied.

**UKR 405.3
Topics in Ukrainian Literature
1/2(3L)**

Prerequisite(s) or Corequisite(s): UKR 314, 317.

Either a single genre or a special topic in Ukrainian literature will be studied.

**UKR 410.3
Topics in Ukrainian Civilization
1/2(3L)**

Prerequisite(s): UKR 230; UKR 314, 317 (concurrently with permission).

One topic in Ukrainian civilization will be studied, such as: the pre-Christian religion and mythology of Kievan Rus'; the material folk cultures of the main ethnographic regions of Ukraine; Ukrainian folk arts and folklore under the Soviets.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

UKR 398.3 1/2(3S)
UKR 399.6 1&2(3S)
UKR 498.3 1/2(3S)
UKR 499.6 1&2(3S)

VETERINARY ANATOMY

GRADUATE COURSES

Department of Veterinary Biomedical Sciences, College of Graduate Studies & Research

**VT AN 709.3
Gross Anatomy of Domestic Animals
1(2L-4P)**

Prerequisite(s): Permission of the instructor.

A comparative, topographical, functional study of the trunk of the domestic animals. There is therefore an emphasis on the respiratory, digestive and reproductive systems. A special project in anatomy designed by student and instructor is required.

Note: Students with credit for VT AN 210 may not take this course for credit.

**VT AN 710.3
Gross Anatomy of Domestic Animals
2(2L-4P)**

Prerequisite(s): Permission of the instructor.

A comparative and topographical study of the head and limbs of the domestic animals with an emphasis on functional aspects of the locomotor system. There is also a brief

introduction to the anatomy of laboratory mammals and domestic birds.

Note: Students with credit for VT AN 210 may not take this course for credit.

**VT AN 711.3
Microscopic Anatomy of Domestic Animals
1(3L-4P)**

Prerequisite(s): Permission of the instructor.

A basic, intensive course in microscopic anatomy, covering cytology and the histology of the basic tissues and organs of domestic animals. Clinical and functional relationships of microscopic structure are emphasized. In addition to classroom work, there are out-of-class assignments. Students must furnish their own microscopes.

Note: Students with credit for VT AN 211 may not take this course for credit.

**VT AN 712.3
Neuroscience of Domestic Animals
2(3L-2P)**

Prerequisite(s): Permission of the instructor.

The structure and function of the nervous system of domestic animals including major neuronal pathways and their basic physiology. Clinical applications are emphasized. The basic reflexes used in neurological diagnosis are included. There are out-of-class assignments. A term paper is required.

Note: Students with credit for VT AN 212 may not take this course for credit.

**VT AN 713.6
Developmental Anatomy and Introductory Systemic Gross Anatomy of Domestic Animals
1&2(4L-4P)**

Prerequisite(s): The instructor's permission.

A study of fetal development including congenital anomalies. Organogenesis is correlated with basic systemic gross anatomy. A special project in developmental anatomy designed by student and instructor is required. Students must supply their own microscope.

Note: Students with credit for VT AN 213 may not take this course for credit.

**VT AN 802.3
Special Field Experiences
2 weeks(80 hrs)**

**VT AN 803.6
4 weeks(160 hrs)**

Total immersion in the area of study pertinent to the graduate student. A complete report is required and should come from a daily log of activities. The report should be organized according to a protocol set up by the student's advisory committee prior to going out on this experience.

**VT AN 821.3
Ultrastructural Cytology
1(2/4T)**

Prerequisite(s): Permission of the instructor.

A survey of cytoarchitecture drawing heavily on examples from mammalian species. Emphasis will be on interpretation of electron micrographs, but technical problems will also be considered. Students will be encouraged to present their own micrographs for discussion.

**VT AN 898.3/899.6
Special Problems in Anatomy
1&2(1S-1R)**

For graduate students in other departments, research in areas of anatomy related to thesis topic. For graduate students in Veterinary Anatomy, research in areas of anatomy unrelated to thesis topic.

**VT AN 992.6
Project**

Students undertaking the project Master's degree (M.Vet.Sc.) must register in this course.

**VT AN 994
Research**

Students writing a Master's thesis must register for this course.

**VT AN 996
Research**

Students writing a Ph.D. thesis must register for this course.

**VETERINARY
ANESTHESIOLOGY,
RADIOLOGY AND SURGERY**

GRADUATE COURSES

Department of Small Animal Clinical Sciences, College of Graduate Studies & Research

**VTARS 783.6
Advanced Clinical Veterinary Anesthesia, Radiology and Surgery
1&2 (20C)**

Procedures in diagnostic and therapeutics as applied to the daily clinical case load.

**VTARS 802.3/803.6
Special Field Experiences
1/2(40P, 2 weeks), 1/2(40P, 4 weeks)**

Total immersion in the area of study pertinent to the graduate student. A complete report is required and should come from a daily log of activities and be organized from a protocol set up by the student's advisory committee prior to going out on this experience.

**VTARS 866.3
Advanced Radiographic Diagnosis - Large Animals
1/2(1S-1R)**

A tutorial course covering the radiographic diagnosis of disease in large animals. Familiarizes the student with normal radiographic anatomy and the radiographic signs of disease in the skeleton, thorax and abdomen of these species.

**VTARS 898.3/899.6
Special Topics
1/2(3R), 1&2(3R)**

To be defined and described each time it is offered. A thorough study of a special topic pertinent to the specific goals of the candidate and their program.

**VTARS 990
Seminar**

Discussion on research plans, protocols, and results by graduate students and faculty. Graduate students are required to attend and participate. Faculty and visiting scientists may also contribute to the course.

COURSES • Veterinary Biomedical Sciences

VTARS 992.6

Project

Students undertaking the project Master's degree (M.Vet.Sc.) must register in this course.

VTARS 994

Research

Students writing a Master's thesis must register for this course.

VTARS 996

Research

Students writing a Ph.D. thesis must register for this course.

VETERINARY BIOMEDICAL SCIENCES

Department of Veterinary Biomedical Sciences, College of Veterinary Medicine

These courses are restricted to students enrolled in the Doctor of Veterinary Medicine program, unless otherwise stated.

*Denotes courses open to students in the College of Agriculture.

VBMS 210.7

Anatomy

Q1&2(2L-4P), Q3&4(3L-4P)

A general introduction to the anatomy of the common domestic species with emphasis on areas of particular functional and clinical significance or biological importance.

VBMS 211.4

Histology

Q1(3L-4P), Q2(3L-4P)

A general overview of the microscopic and ultrastructural anatomy of vertebrate cells, tissues and organs emphasizing functional relationships.

VBMS 212.3

Neuroscience

Q3(2L-1P), Q4(4L-2P)

A study of the structure and function of the nervous system of domestic animals with emphasis on general clinical applications.

VBMS 213.2

Embryology

Q1&2(2L-1P)

Emphasizes the study of embryonic development, including organogenesis and congenital anomalies.

VBMS 221.8

Physiology I

Q1(3L-1P), Q2(2L-4P), Q3(3L-5P), Q4(3L-3P)

Prerequisite(s): Registration in the D.V.M. program or permission of the instructor.

The function of the physiological systems of mammals is studied with emphasis upon domestic animals and veterinary medical aspects. After an introductory consideration of certain aspects of general physiology and hematology, the physiology of the cardiovascular, respiratory, renal and endocrine systems is studied. In the laboratory the principles of physiology are demonstrated through laboratory experiments and observations upon the normal animal. An understanding of contemporary physiological measurement

techniques is stressed as a background for potential clinical application.

*VBMS 314.3

Comparative Anatomy of Domestic Animals

2(3L-2P)

Prerequisite(s): Open to students in the College of Agriculture.

A general review of the macroscopic and microscopic anatomy of the domestic animals with emphasis on those structures, such as the digestive and reproductive systems, that are of particular importance to students of Animal Science.

VBMS 320.2

Physiology II

Q1(2L), Q2(2L-2P)

Prerequisite(s): VT P 221.

A continuation of Physiology I in which the digestive systems of monogastrics and ruminants are studied. Laboratory experiments are designed to illustrate the principles covered in the lecture material.

VBMS 323.3

Basic Principles of Pharmacology

Q1(3L), Q2(4L), Q3(3L)

Prerequisite(s): Registration in the D.V.M. program or permission of the instructor.

General pharmacological principles are reviewed. The pharmacology of important drugs is discussed with emphasis on mechanism of action, absorption, distribution, metabolism, excretion, uses, and toxicity. Chemotherapeutic drugs are considered from the viewpoint of: action on the parasitic organism, spectrum of activity, development of resistance, and toxicity in the host.

*VBMS 324.3

Animal Physiology I

1(3L-3P)

Prerequisite(s): Open to students in the College of Agriculture.

To provide undergraduate students with an understanding of mammalian and avian physiology, with major emphasis on domestic farm animals. Topics include hematology, respiration, the cardiovascular system, renal physiology and monogastric digestion.

*VBMS 325.3

Animal Physiology II

2(3L-3P)

Prerequisite(s): VT P 324. Open to students in the College of Agriculture.

To provide undergraduate students with an understanding of mammalian and avian physiology, with major emphasis on domestic farm animals. Topics include ruminant digestion, endocrinology, pre-natal growth, reproduction and lactation.

VBMS 424.2

Toxicology

Q1(2L-1P), Q2(1L-1P)

Prerequisite(s): Registration in the D.V.M. program or permission of the instructor.

A consideration of toxic agents, their principles, modes of action and manifestations in affected animals; and a brief survey of important poisonous plants of western Canada.

*VBMS 425.3

Introduction to Toxicology

1/2(3L-1S)

Prerequisite(s): PHSIO 212 or equivalent; BIOCH 200 and 211 (or 203) recommended. Open to students in the College of Agriculture.

An introduction to the basic knowledge about toxic substances; their chemistry, sources, modes of exposure, influence on life processes, overall effect on living organisms (with particular reference to vertebrates) and the principles exercised for the use of antidotal or preventive measures against these compounds.

VBMS 426.2

Veterinary Clinical Pharmacology

Q1(3L), Q2(3L-1P)

Pharmacology as it applies to the treatment of animals with clinical disease will be emphasized through a combination of lectures and practicum sessions. Principles of clinical pharmacokinetics, drug interactions and adverse drug reactions will be addressed. Lectures on specific groups of drugs will utilize a system-oriented approach. Practicum sessions consist of discussions of the pharmacologic management of specific diseases and rationale for drug selection.

*VBMS 428.3

Gastrointestinal Physiology

1(3L)

Prerequisite(s): PHSIO 333 or permission of the instructor.

Provides an in-depth coverage of monogastric gastrointestinal function, stressing those aspects related to the understanding of diseases of this system

GRADUATE COURSES

See Veterinary Anatomy and Veterinary Pathology

VETERINARY

INTERDEPARTMENTAL

College of Veterinary Medicine

These courses are restricted to students enrolled in the Doctor of Veterinary Medicine program, unless otherwise stated.

*Denotes courses open to students in the College of Agriculture.

VTINT 201.1

Survey of Veterinary Medicine

Q1(2L)

A series of seminars introducing the student to the veterinary profession. Topics include career opportunities in veterinary medicine, professional behaviour and professionalism, ethics, the human-animal bond, animal rights and welfare, etc.

VTINT 481.3

Year III Clinics

Q1, 2, 3&4(3P)

This is the initial, formal introduction to clinics and consists of rotation through selected clinical areas. Experiences will include working with clinical cases as an assistant to Year 4 students (including surgery), receiving duty, participation in

clinical rounds, working with medical records, pharmacy management, etc. Specific types of experiences will vary among the rotations. The objectives of the course are to obtain "hands-on" clinical experience at an introductory level, to have an opportunity for correlating basic and applied sciences to this clinical experience, and to become acquainted with the operation and organization of the Veterinary Teaching Hospital.

VTINT 580.34

Applied Veterinary Medicine

(Clinics)

Q1, 2, 3&4(32hrs/wk)

Full-time course load for Year 4 WCVM students. Provides students an opportunity to develop, integrate and apply veterinary medical knowledge and skills in a clinical setting under faculty supervision. Consists of 32 weeks of clinical and other applied experiences. Most of these are clinical rotations in the Veterinary Teaching Hospital but experiences outside of WCVM are permitted. Each student is required to write and submit a satisfactory case report based on one of their experiences during the session.

GRADUATE COURSES

College of Graduate Studies

VTINT 980

Clinical Practice

Recognizes the many clinical activities of students in the program that may not be otherwise credited. Students are required to make satisfactory progress in this course to maintain full-time student status in the program.

VETERINARY INTERNAL

MEDICINE

GRADUATE COURSES

Department of Small Animal Clinical Sciences, College of Graduate Studies & Research

VT IM 783.6

Advanced Veterinary Internal

Medicine

1&2(20C)

Procedures in diagnostic and therapeutics as applied to the daily clinic case load.

VT IM 800.6

Advanced Veterinary Internal

Medicine I

1/2(2L/2S)

Deals with the pathophysiology of animal disease on a body system or organ basis. The mechanisms of disease and the rational approach to diagnosis and therapy are emphasized. Topics include an introduction to the pathophysiology, systemic states, cardiovascular system, blood and hemopoietic system, respiratory system and the gastrointestinal tract.

VT IM 801.6

Advanced Veterinary Internal

Medicine II

1/2(2L/2S)

Deals with the pathophysiology of animal disease on a body system or organ basis. The mechanisms of disease and the rational

approach to diagnosis and therapy are emphasized. Topics include the urinary system, nervous system and eyes, endocrine system, musculoskeletal system, skin and appendages, immune system, and genetics and reproduction.

**VT IM 803.6
Special Field Experiences
1/2(40P,4 weeks)**

Must be full time and of at least one month's duration. Purpose is total immersion in the area of study pertinent to the graduate student. A complete report is required and should come from a daily log of activities and be organized from a protocol set up by the students' advisory committee prior to going out on this experience.

**VT IM 898.3/899.6
Special Topics
1/2(3R), 1&2(3R)**

To be defined and described each time it is offered. A thorough study of a special topic pertinent to the specific goals of the candidate and their program.

**VT IM 990
Seminar**

**VT IM 992.6
Project**

Students undertaking the project Master's degree (M.Vet.Sc.) must register in this course.

**VT IM 994
Research**

Students writing a Master's thesis must register for this course.

**VT IM 996
Research**

Students writing a Ph.D. thesis must register for this course.

VETERINARY MICROBIOLOGY

Department of Veterinary Microbiology,
College of Veterinary Medicine

These courses are restricted to students enrolled in the Doctor of Veterinary Medicine program, unless otherwise stated.

*Denotes courses open to students in the College of Agriculture.

**VT MC 236.3
Epidemiology and Public Health
Q4(2L-2P)**

An introduction to the study of the dynamics of disease in animal populations. Topics include the strategy of epidemiology, sampling techniques, data collection and analysis, hypothesis formulation and testing, and directed actions against disease in populations.

**VT MC 330.2
Immunology
Q3(3L-3P)**

Covers basic aspects of humoral and cell-mediated immunity, the role of immunological reactions in infectious disease pathogenesis, hypersensitivity, and auto-immune disease. Students will study the principles of immunity to bacteria, viruses and parasites and the fundamentals of vaccination. Students will also be familiarized with diagnostic techniques for

assessing the immune system and for diagnosis of immune-mediated diseases.

**VT MC 333.2
Virology
Q3(4L-2P)**

A case-based approach to veterinary virology. Cases from WCVM files and published literature supplemented by lectures on basic virology used to illustrate general principles of virus infection, replication, spread and control.

**VT MC 337.3
Veterinary Bacteriology and Mycology
Q1&2(2L-2P)**

Provides basic knowledge of the common bacterial and fungal diseases of animals, with emphasis on those present in North America. Coverage of specific diseases/organisms include: distribution, epidemiology, mechanisms of pathogenesis, immunity, diagnosis, and prevention. Laboratory sessions emphasize the proper selection, collection and transportation of bacteriologic and fungal specimens. Basic processing of clinical/pathological specimens and identification of bacteria and fungal organisms commonly present in those specimens is offered.

**VT MC 338.3
Parasitology
Q1&2(2L-2P)**

Protozoan, helminth and arthropod parasites, including zoonoses of domestic and other animals will be studied. The course will cover aspects of life cycles, pathogenesis, diagnosis, epidemiology, treatment and prevention.

GRADUATE COURSES

Department of Veterinary Microbiology,
College of Graduate Studies & Research

**VT MC 830.3
Recent Advances in Microbiology
2(1S-2T)**

This course is a requisite for students in Veterinary Microbiology.

Partly tutorial, but also consisting of assigned reviews of recent advances in selected areas of microbiology, including bacteriology, epidemiology, immunology, parasitology and virology. Discussions are student-driven and facilitated by individual faculty members with expertise in the areas of discussion. Training is also given in the interpretation of published scientific reports and in the writing of grant applications.

**VT MC 831.3
Techniques in Molecular Biology
(previously Research Techniques and Instrumentation)
1/2(2L-2P)**

Prerequisite(s): BIOCH 811.3 Introduction to Molecular Biology, or equivalent.

A "hands-on" laboratory course designed to familiarize students with a wide variety of techniques in molecular biology: manipulation of DNA for cloning and analysis; detection of nucleic acids; sequencing of DNA; site directed mutagenesis, purification of recombinant proteins by immunological techniques; detection of rare nucleic acids by polymerase chain reaction. Students are

given a gene for an "unknown" protein. They then proceed with a detailed characterization of the structure and function of the protein.

**VT MC 832.3
Epizootiology of Infectious Diseases
1/2(2L-1S)**

Lectures, seminars and exercises will be given on the epizootiology and control of collection of data and sampling; application of infectious diseases of animal populations, with emphasis given to: techniques of collection of data and sampling; application of modern microbiological laboratory methods; analysis of data; and interpretation of results, as applied to epizootiological investigations.

**VT MC 833.3
Advanced Virology
1/2(2S-1T)**

Discusses virus genetics, mapping of virus genes, replication of virus components as well as the molecular aspects of virus-cell interactions as they relate to virus replication and cell death, virus persistence and transformation.

**VT MC 834.6/839.3
Topics in Advanced Parasitology
1&2(2L-1S)**

Lectures on current topics in parasitology. Group discussion based on assigned reading in scientific literature; topics selected in part according to student's interests.

**VT MC 835.3 Diagnostic Veterinary Bacteriology
1/2(2L-6P)**

Devoted to the culture, biochemical reactions and identification of pathogenic, aerobic and anaerobic bacteria and fungi from domestic, exotic and "alternate species" including birds. Emphasis will be on interpretation of findings in agreement with information gathered from clinical history/lesion(s) provided in different cases. Other responsibilities include familiarization with culture media; some new diagnostic techniques; completion by each student of 20-30 cases.

**VT MC 836.3
Diagnostic Veterinary Virology
1/2(2L-4P)**

Includes the culture and identification of animal viruses in animals, cell culture or chick embryos. Serology, fluorescent antibody and other techniques for virological diagnosis will be emphasized.

**VT MC 837.3
Diagnostic Veterinary Parasitology
1/2(2L-4P)**

The isolation and identification of parasites, both internal and external, from clinical and necropsy specimens will be emphasized. Methods of parasite culture and preservation will be covered.

**VT MC 838.6
Applied Epizootiology
1&2(L/S)**

Students become familiar with the philosophy and principles of epizootiology and the practical application of epizootiologic techniques especially as they apply to control. Consists of lectures, field trips, epizootiologic exercises and syndicate sessions.

**VT MC 841.6
Research Methods in Cellular and Molecular Immunology
1/2 T1 Spring and Summer Session
(2.5L-37.5P)**

This is an intensive "hands-on" course designed to teach graduate students basic and advanced cellular and molecular methods commonly employed in laboratory immunology: cell purification and characterization, antibody production, purification and characterization, ELISA, ELISPOT, bioassays, MACS, immunohistochemistry, in situ hybridization, Northern blotting.

**VT MC 898.3/899.6
Special Problems in Veterinary Microbiology
1/2(2L-1S-6P), 1&2(2L-1S-6P)**

A special problem arising in a field or clinical investigation will be assigned to the student and supervised by a departmental faculty member. The student will be responsible for the collection of data, scientific reading around the subject, and the preparation of a clinical case report or a research paper on their findings.

**VT MC 990
Seminar**

Graduate students are required to attend and take part in the seminar throughout their program. Faculty and visiting scientists may also contribute to the course.

**VT MC 992.6
Project**

Students undertaking the project Master's degree (M.Vet.Sc.) must register in this course.

**VT MC 994
Research**

Students writing a Master's thesis must register for this course.

**VT MC 996
Research**

Students writing a Ph.D. thesis must register for this course.

VETERINARY PATHOLOGY

Department of Veterinary Pathology,
College of Veterinary Medicine

These courses are restricted to students enrolled in the Doctor of Veterinary Medicine program, unless otherwise stated.

*Denotes courses open to students in the College of Agriculture.

**VT PA 342.3
General Pathology
Q1&2(3L-4P)**

Basic pathogenic mechanisms that underlie disease processes are discussed. Functional derangements are correlated with structural alterations. The following topics are considered: cell and tissue injury, disturbances of circulation and hemostasis, inflammation, healing and repair, immunopathology, disturbances of growth and neoplasia.

**VT PA 343.5
Systemic Pathology
Q3(3L-4P), Q4(3L-2P)**

The principles discussed in general pathology will be utilized in the consideration of the pathology of specific diseases which affect the body systems of domestic animals. Principles of pathogenesis and diagnosis will be stressed.

***VT PA 412.3
Diseases of Poultry
2(2L-1P)**

Prerequisite(s): Open to students in the College of Agriculture.

Designed to provide information on the causes, signs and control of common poultry diseases for students with little or limited background in the anatomy, physiology, microbiology and pathology of the avian species. Emphasizes the effect of disease as a limiting factor in efficient poultry production and the control of disease on a modern poultry farm. Given in alternate years.

**VT PA 445.2
Avian and Laboratory Animal
Medicine
Q3(3L-1P), Q4(2L-1P)**

Common diseases of poultry, other avian species, laboratory animals and caged pets are discussed. Diagnosis and pathology are emphasized. The general principles of preventive medicine in poultry and laboratory animals are reviewed. The principles of treatment of diseases in avian and other caged pets are also reviewed. The use of animals in research is discussed.

**VT PA 446.2
Clinical Pathology
Q1&2(2L-2P)**

Designed to teach the student how to interpret laboratory data and apply practical clinical laboratory techniques in chemistry, hematology, cytopathology and urology in the diagnosis of disease.

GRADUATE COURSES

Department of Veterinary Pathology,
College of Graduate Studies & Research

Permission of the instructors is required for registration in all courses offered by this department.

**VT PA 810.3
Clinical Hematology
1/2(1L-2S)**

Presented biennially in lectures and tutorial sessions utilizing current previously selected clinical laboratory material. Assigned reading, review of cases and presentation of such cases in seminars are part of this course.

**VT PA 811.3
Clinical Chemistry
1/2(1L-2S)**

Presented biennially in lectures and tutorial sessions utilizing current clinical laboratory specimens. Interpretation of tests and methodology are stressed. Includes assigned reading, review of cases and presentation of such cases in seminars.

**VT PA 820.3
Mammalian Pathology I
(Formerly 860)
1/2(2S-6C)**

**VT PA 821.3
Mammalian Pathology II
1/2(2S-6C)**

Necropsy technique and examination of animals submitted for diagnosis. Pathogenesis and diagnosis are emphasized. The student will be required to complete at least 30-50 cases for 3 credit units. Selected cases are to be discussed at weekly necropsy conferences. Other studies include familiarization with histological techniques, histochemical techniques and macro and micro-photography.

**VT PA 822.3
Mammalian Pathology III
1/2(1/2S-8/10P)**

**VT PA 823.3
Mammalian Pathology IV
1/2(1/2S-8/10P)**

Prerequisite(s): VT PA 821 or permission of the course coordinator.

Necropsy technique and gross and histopathology submitted for diagnosis. Each course is prerequisite to the next. Students will spend 4 months on the diagnostic service roster and complete 30-50 cases for 3 credit units.

**VT PA 830.3
Surgical Pathology I
1/2(1S-6C)**

**VT PA 831.3
Surgical Pathology II
1/2(1S-6C)**

Gross and microscopic examination of biopsy material submitted to the diagnostic service. Diagnosis and prognosis is stressed, especially in regard to neoplastic diseases. Selected cases are presented by students in a weekly seminar.

**VT PA 832.3
Surgical Pathology III
1/2(1/2S-2/3P)**

**VT PA 833.3
Surgical Pathology IV
1/2(1/2S-2/3P)**

Prerequisite(s): VT PA 830 or 831.

Gross and microscopic examination of biopsy material submitted to the diagnostic service. Diagnosis and prognosis is stressed, especially in regard to neoplastic diseases. Selected cases are presented by students in a weekly seminar.

**VT PA 841.3
Toxicopathology
1(2L-1S-2T)**

Prerequisite(s): VT PA 342 and 343; or equivalent.

Given in alternate years. A review of the principles of toxicopathological testing and the most important aspects of general pathobiology will be followed by a presentation of toxic injury to specific body systems.

**VT PA 850.3
Diagnostic Clinical Pathology I
1/2(2/3S-10/12P)**

**VT PA 851.3
Diagnostic Clinical Pathology II
1/2(2/3S-10/12P)**

**VT PA 852.3
Diagnostic Clinical Pathology III
1/2(2/3S-10/12P)**

**VT PA 853.3
Diagnostic Clinical Pathology IV
1/2(2/3S-10/12P)**

Prerequisite(s): VT PA 850 is a prerequisite for VT PA 851, VT PA 851 for VT PA 852, VT PA 852 for VT PA 853.

Diagnostic medical interpretations in clinical biochemistry, hematology, urology and cytology. Interpretation of clinical material is supplemented with formal case discussions and directed reading.

**VT PA 869.3
Avian Pathology I
1/2(1L-2P)**

Reviews the pathology of the avian species by systems emphasizing histopathology. Lectures will be supplemented by slide study sets and selected reading material. May only be offered in alternate years.

**VT PA 871.3
Avian Necropsy I
1/2(4C)**

**VT PA 872.3
Avian Necropsy II
1/2(4C)**

Prerequisite(s): VT PA 445, 869; or equivalent.

Necropsy technique of birds submitted for diagnosis of flock diseases. Suitable laboratory procedures following necropsy examination are emphasized. Treatment and control of flock diseases encountered are discussed. Selected cases are presented and discussed by students at the weekly necropsy conferences of the department. To obtain 3 credit units the student will be required to complete approximately 30 cases.

**VT PA 873.3
Wildlife Diseases
1/2(2L-1S-1T)**

Prerequisite(s): VT PA 343; or equivalent.

Deals with infectious and non-infectious diseases including environmental toxicants, of free-living mammals, birds and fish. The etiology, epizootiology, pathogenesis and ecologic significance of the conditions will be considered. Emphasizes diseases occurring in Western Canada.

**VT PA 875.3
Diagnosis of Wildlife Diseases I
1/2(1S-3C)**

**VT PA 876.3
Diagnosis of Wildlife Diseases II
1/2(1S-3C)**

Necropsy and investigative techniques for the diagnosis of disease in wild mammals, birds and fish. Laboratory procedures following necropsy will be encouraged. Selected cases will be presented and discussed by students at the weekly necropsy conferences of the department.

Students will be required to satisfactorily complete approximately 40 cases.

**VT PA 898.3/899.6
Special Problems in Veterinary
Pathology
1/2(2C-R), 1&2(2C-R)**

A thorough study on a selected topic in veterinary pathology will be undertaken. Includes examination of pathological material, tutorial sessions, collateral reading and presentation of a seminar.

**VT PA 990
Seminar**

A weekly seminar on interesting pathological and clinicopathological cases. All graduate students in the Department of Veterinary Pathology are required to register and attend.

**VT PA 991
Seminar in Histopathology
1&2(1S-1R)**

A weekly seminar dealing with the histology of disease processes. All students in the Department of Veterinary Pathology are required to register and attend.

**VT PA 992.6
Project**

Students undertaking the project Master's degree (M.Vet.Sc.) must register in this course.

**VT PA 994
Research**

Students writing a Master's thesis must register for this course.

**VT PA 996
Research**

Students writing a Ph.D. thesis must register for this course.

**VETERINARY PHYSIOLOGICAL
SCIENCES**

GRADUATE COURSES

Department of Veterinary Biomedical Sciences, College of Graduate Studies & Research

**VT P 824.6
Advanced Mammalian Physiology
Q1(2L), Q2(3L-3P), Q3(4L-5P), Q4(3L-5P)**

The physiological systems of mammals are studied with emphasis on domesticated species. Hematology, general physiology and biophysics, the cardiovascular, respiratory, renal and nervous systems are covered. Laboratory experiments and observations are conducted on normal animals, emphasizing an understanding of physiological measuring techniques.

**VT P 826.3
Advanced Endocrinology
1(3L/T-3P)**

Lectures deal with all hormones except those of the gastrointestinal tract. Emphasis is placed on protein and peptide hormones, particularly those which play a fundamental role in regulation of intermediary metabolism. Tutorials are designed to require students to develop a familiarity with current scientific literature. Laboratory sessions acquaint students with current

endocrine research techniques. Students select a project, design, conduct and report the data in class.

**VT P 827.3
Advanced Neurophysiology
2(2L-4P)**

An advanced lecture and laboratory course in neurophysiology with special emphasis on current methods of investigation utilized in this field.

**VT P 828.3
Gastrointestinal Physiology
1(3L)**

Provides an in-depth coverage of monogastric gastrointestinal physiology, stressing those aspects related to the understanding of gastroenteric disease. Includes a review of the regulation of feed intake.

**VT P 830.3
Physiology and Endocrinology of
Reproduction in Mammals
1(3L)**

Topics will be hormones of reproduction, sexual differentiation and maturation, physiology and endocrinology of male reproductive system, reproductive cyclicity in the female, gestation and parturition, reproductive behaviour, and the seasonality of reproductive activity.

**VT P 833.3
Subclinical Toxicology
1/2(3L-1S)**

Prerequisite(s): VT P 836; PSY 110 is desirable.

Discusses subclinical manifestations to toxic agents. The emphasis will be on immunological and behavioral alterations produced by a variety of chemical agents. Animal models and testing methods used to evaluate the effects will be discussed, along with various public health considerations and significance.

**VT P 836.5
General Toxicology I
1(4.5L-1S)**

Prerequisite(s): VT P 425.

General principles of toxicology - including principles of toxicokinetics and toxicodynamics, factors influencing toxicity, mechanisms of actions of poisons and antidotes, methods of toxicity evaluation. Toxicology of common poisons e.g. pesticides, metals and metalloids, toxic gases, poisonous plants, zootoxins, etc. Aims at the basic science aspect of toxicology and not at clinical diagnosis or treatment of specific toxicoses.

**VT P 837.5
General Toxicology II
2(4.5L-1S)**

Prerequisite(s): VT P 836.

Four areas are emphasized: 1) systematic toxicology - types of injury produced in specific organs/systems by toxic agents and agents which produce these effects; 2) environmental toxicology - entry, persistence, amplification and effects of environmental pollutants; 3) subclinical toxicosis by environmental contaminants, carcinogenesis, teratogenesis, mutagenesis; 4) nutritional toxicology - methodology, national and international

standards and consideration of natural and manmade toxic substances.

**VT P 898.3/899.6
Special Problems in Veterinary
Physiological Sciences
1/2(3S), 1&2(3S)**

Research on a selected topic separate from the thesis topic may be undertaken. The approach will consist of conferences, collateral reading, laboratory work and a detailed report.

**VT P 990
Seminar**

Graduate students in the department are required to attend and participate. The staff and visiting scientists also contribute to the course. Interested undergraduates may be invited to attend and participate.

**VT P 992.6
Project**

Students undertaking the project Master's degree (M.Vet.Sc.) must register in this course.

**VT P 994
Research**

Students writing a Master's thesis must register for this course.

**VT P 996
Research**

Students writing a Ph.D. thesis must register for this course.

**WOMEN'S AND GENDER
STUDIES**

Department of Women's and Gender Studies, College of Arts & Science

**WGST 110.6
Introduction to Women's and Gender
Studies
1&2(3L or 2L & 1T)**

Introduces students to the research and writings in the area of Women's and Gender Studies. Examines the changing position of women in developed and developing societies since the 19th century. Special attention will be given to the analysis of women's experiences in the Canadian context.

Note: Students with credit for WGST 200.6 may not take WGST 110.6 for credit.

Students majoring in Program Type A, B or C may use this course for Requirement 5. Any student may use this course as an elective.

**WGST 201.3
Images of Women and Men in
Popular Culture
1/2(2L-1T)**

Prerequisite(s): Completion of 30 credit units at the university or permission of the department.

An introduction to a variety of feminist critical approaches to mass media art forms. Focuses on visual and literary images of women and men in post-World War II North American popular culture.

**WGST 202.3
Gender and Environment
1/2(3L)**

Prerequisite(s): WGST 110.6, or 6 credit units in WGST and/or cognate courses, or

permission of the department.

An interdisciplinary and cross-cultural introduction to theories and practices linking gender and the environment, with particular emphasis on the emergence of ecofeminism in the late 20th century.

Note: Students with credit for WGST 298 (Special Topics: Gender and Environment) may not take this course for credit.

**WGST 203.3
Introduction to Women and
Development
1/2(3L)**

Prerequisite(s): WGST 110 or 6 credit units in WGST and/or cognate courses, or permission of the department. ECON 221 is strongly recommended.

An introduction to feminist analysis, theories, and practices of development affecting and engaged in by women, both locally and in the Third World. Topics include: Women's experience of development under colonialism/imperialism, and neocolonialism; the role of governments, non-governmental organizations, and international aid; the role of the international women's movement and women-centered models of development.

Note: Students with credit for WGST 298 (Special Topics: Women and Development) may not take this course for credit.

**WGST 206.6
Science and Society in Fiction and
Film
1&2(3L)**

Prerequisite(s): 30 credit units, or 6 credit units of WGST and/or ART, or permission of the Department.

An examination of several works of fiction and film that addresses the interface of science and society. Works for examination include science fiction novels and their Hollywood adaptations. The course provides students with an opportunity to debate and research the way in which authors and film makers have represented science, and scientists have influenced the reading and viewing public with respect to the ethical and social issues provoked by developments in Western science.

Note: This course is acceptable for use in requirement (5) in program types A, B, C, and D.

**WGST 210.3
Gendered Perspectives on Cultural
Issues
1/2(3L)**

Prerequisite(s): Completion of 30 credit units at the university or permission of the department.

An interdisciplinary examination of selected contemporary social and cultural issues from the perspective of gender. Students will be introduced to gender as an ideology, a category of analysis, and a theme common to issues such as racism, homophobia, militarism, and environmental crisis.

Note: Students with credit for WGST 101.3 may not take WGST 210.3 for credit. Students majoring in Program Type A, B or C may use this course for Requirement 5. Any student may use this course as an elective.

**WGST 310.3
Feminist Thought to 1980
1/2(3L)**

Prerequisite(s): WGST 110.6 or 6 credit units in WGST and/or cognate courses, or permission of the department. PHIL 227 is recommended.

Examination of the evolution of feminist theory within the larger context of Western political and philosophical thought from the 18th century to 1980. Special attention is given to the relationship of feminist theory to the 19th and 20th century waves of political feminism.

**WGST 311.3
Contemporary Feminist Thought
1/2(3L)**

Prerequisite(s): WGST 110.6 or 6 credit units in WGST and/or cognate courses, or permission of the department. WGST 310 and/or PHIL 227 is recommended.

Examination of contemporary feminist theory from 1980 to the present. Feminist theory will be set within the larger context of anti-Enlightenment philosophy and political thought, including postmodernism, postcolonialism, post-Freudian psychoanalysis and psycholinguistics.

**WGST 312.3
Feminist Research Methodologies
1/2(3L)**

Prerequisite(s): WGST 110.6 or 6 credit units in WGST and/or cognate courses, or permission of the department.

Examines various feminist methodologies and approaches to the formal construction of knowledge. A survey of the major methods of research in diverse fields is presented in the context of feminist critique and epistemology. Androcentric bias, feminist epistemology, ethics and subjectivity are central themes of the course.

Note: Students with credit for WGST 398 (Special Topics: Feminism and the Construction of Knowledge) may not take this course for credit.

**WGST 350.3
Women and Current Legal Issues
1/2(3L)**

Prerequisite(s): WGST 110.6 or 6 credit units in WGST and/or cognate courses, or permission of the department.

An examination of current legal issues from a feminist perspective. Issues may include: gender dominance and dependency; occupational segregation; pay equity; sexual harassment; reproductive technologies; pornography; gender violence.

Note: Students with credit for WGST 398 (Special Topics: Women and Current Legal Issues) may not take this course for credit.

**WGST 351.3
Women, Depression and Writing
1/2(3L)**

Prerequisite(s): WGST 110.6 or 6 credit units in WGST and/or cognate courses, or permission of the department.

Examines the phenomenon of depression, particularly women's depression, from clinical, theoretical, and literary perspectives. Traces the development of a language, theoretical and/or poetic, that

articulates women's experience of depression and challenges the traditional, largely male-constructed discourses on clinical depression.

Note: Students with credit for WGST 398 (Special Topics: Women, Depression and Writing) may not take this course for credit.

**WGST 352.3
Gender Gadgets, Technologies of
Cultural Construction
1/2(3L)**

Prerequisite(s): WGST 110.6 or 6 credit units in WGST and/or cognate courses, or permission of the department.

An interdisciplinary examination of the material and conceptual tools, used today and in the past, in a range of media to construct or challenge culturally received notions of gender and other dimensions of identity such as race and ethnicity, class, ability, age, sexuality. Media studied will include some of the following: literature, art, cinema, music, magazines and newspapers, television theatre and performance, scientific texts.

Note: Students with credit for WGST 398 (Special Topics: Four Canadian Women Writers/Painters) may not take this course for credit.

**WGST 353.3
Gender, Culture and Contagion
1/2(3L)**

Prerequisite(s): WGST 110.6 or 6 credit units in WGST and/or cognate courses, or permission of the department.

An examination of theories of contagion and knowledge of contagious disease from

a feminist perspective. A survey of major diseases, of past and present importance, explores how men and women experience contagious disease and how these experiences are represented in technical and popular literature. The current HIV/AIDS pandemic figures prominently in the course.

**WGST 354.3
Women and Addiction
1/2(3L)**

Prerequisite(s): WGST 110.6 or 6 credit units in WGST and/or cognate courses, or permission of the department.

An examination of the experiences of women with various forms of addiction. Surveyed are how women live with problems of dependency, how they are represented in popular and technical media, how they care for others with substance abuse problems, and how they are treated in existing medical and social service facilities.

Note: Students with credit for WGST 398 (Special Topics: Women and Addiction) may not take this course for credit.

**WGST 409.3
Understanding Western Patriarchy
1/2(3S-1T)**

Prerequisites: 18 credit units of WGST and/or cognate courses, including at least two of WGST 310.3, 311.3, 312.3, PHIL 227.3, HIST 347.3, RELST 359.3; and permission of the Department.

Examination of a selection of texts which helped to shape gender, race, class, and ethnic arrangements in Western culture

from 1700 BCE to the early 20th Century. The focus will be on influential sacred, legal, philosophical, and political writings that made the emergence of feminist thought and the rise of political feminism both necessary and possible.

Note: Students with credit for WGST 309.3 may not take this course for credit.

**WGST 410.3
Senior Seminar in Gender and
Culture
1/2(3S)**

Prerequisites: 18 credit units of WGST and/or cognate courses, including at least two of WGST 210.3, 310.3, 311.3, 312.3, 352.3, and permission of the Department.

An advanced seminar on a contemporary theme in gender and cultural studies. The theme will vary from year to year in accordance with the research interests of the instructor and new developments in the field. Student presentations and discussions will be emphasized. Students are required to have an e-mail account and access to the Internet.

**WGST 413.3
Community Practicum
1/2(3S)**

Prerequisite(s): WGST 312 and permission of the instructor.

A collaborative effort between the individual student, a community organization and the Department of Women's and Gender Studies. It provides students with the opportunity to apply the theoretical and methodological tenets of feminism and Women's Studies, and to benefit from first-

hand research and community work. Students must design and implement a project that meets the approval of a particular organization and the Department of Women's and Gender Studies.

**WGST 453.3
Gender, Health & Body: A Senior
Seminar
1/2(3S)**

Prerequisites: 18 credit units of WGST and/or cognate courses, including at least two of WGST 312.3, 351.3, 353.3, 354.3, and permission of Department.

An advanced seminar on the cultural and political dimensions of health and body. This course examines the trends in feminist research on representations of bodies in states of health and illness and the gendered nature of regulating bodies. Special themes, such as international health and "exoticized bodies" along with gendered minds and mental health, and reproduction, will be explored in accordance with new developments in the field.

SPECIAL TOPICS

These courses are offered occasionally by visiting faculty and in other special situations. Students interested in these courses should contact the department for more information.

WGST 298.3 1/2(3S)

WGST 299.6 1&2(3S)

WGST 398.3 1/2(3S)

WGST 399.6 1&2(3S)